

dr Slobodan D. Jovanović

**VOKABULAR ENGLESKOG JEZIKA
MEDICINSKE STRUKE**

Izbor tekstova i testova za usvajanje leksike

Fokus – Forum za interkulturalnu komunikaciju

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Slobodan D. Jovanović
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Recenzenti

Prof. dr Ljiljana Jovković,
Univerzitet u Beogradu
Doc. dr Zorica Antić,
Medicinski fakultet Univerziteta u Nišu
Doc. dr Nenad Tomović,
Filološki fakultet Univerziteta u Beogradu

Urednik

Mr Maja Matić

Izdavač

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PREDGOVOR

Vokabular engleskog jezika medicinske struke je zbirka tekstova i testova čije je stvaranje motivisano potrebama vidljivim u praksi i čestim eksplicitno izraženim očekivanjima studenata medicine, isto kao i studenata jezika i prevodilaca koji se upuštaju u zahtevе jezika struke, da im se ponude dodatni materijali za čitanje, vežbanje, rešavanje zadataka u vezi s vokabularom i vladanjem rečničkim bogatstvom engleskog jezika. Sadržaj koji je ovde ponuđen sasvim sigurno može da koristi svima na svim poljima rada u okviru medicinske primene koji žele da uče i šire svoj rečnik engleskog jezika u ovoj posebnoj nameni. Vrlo širokoj publici na raznim nivoima i u različitim profilima specijalizacije ovakva zbirka bi morala da donese veliku praktičnu korist. Najpraktičnija strana ovako uobličene materije trebalo bi da se vidi u činjenici da ona omogućava samostalan rad, osim što, naravno, može da služi nastavnicima na svim nivoima – kao izbor tekstova, kao pregršt ideja za vežbanje, za davanje dodatnih primera, za sastavljanje zadataka pri proverama znanja.

Savremeni trenutak karakteriše se snažno oživljenim interesovanjima za vokabular engleskog jezika i njegovo usvajanje i obogaćivanje u opštem smislu, pa je razumljiva i težnja da se njim uspešno vlada i u grananju ka sve specifičnijim oblastima primene. Upravo iz tih razloga ova knjiga ne izlaže i ne objašnjava gramatičku građu, već podrazumeva da svi njeni korisnici već vladaju određenom merom strukture kao okvirom koji će se popunjavati kvalitetom u smislu što bogatijeg i što efikasnijeg rečnika, opšteg ali i postepeno sve stručnijeg. Zbog toga je prva celina koju ona donosi sastavljena od originalnih materijala iz priznatih savremenih udžbenika, enciklopedijskih i popularnonaučnih publikacija, kao i od tekstova iz odabrane beletristike i kvalitetne dnevne štampe, čime se obezbeđuju svežina i raznovrsnost.

Svi izloženi tekstovi pretrpeli su minimalno prilagođavanje potrebama ovakve zbirke, makar samo u smislu neophodnih skraćivanja. Zatim se naročita pažnja posvećuje brojnim izdvojenim rečima i izrazima, čije su upotrebe dočarane velikim brojem rečenica preuzetih iz kvalitetnih monolingvalnih rečnika. Prevoda nema, kako bi korisnici bili podstaknuti da se vraćaju tekstovima i rečeničnim primerima u cilju shvatanja suštine

značenja i specifičnih razuđivanja upotrebe. Na višim nivoima rada ovakva jednojezična priroda materijala je u stvari osnovni preduslov za začinjanje razgovora na različite teme, opšte i stručne, čime se prilazi idealnoj kombinaciji vladanja rečnikom i njegove primene na aktivan način – u neposrednoj komunikaciji ili u pripremanju samostalnih izlaganja.

I izvođačima nastave i studentima i svim drugim korisnicima od još većeg značaja bi morao da je drugi deo ovog priručnika, sastavljen od originalnih testova s višečlanim izborom koji svojim brojem i sadržajem prate prethodno izložene tekstove. Ukupan broj rečenica u njima, kao i ukupan broj reči i izraza izloženih u vidu ponuda za rešenja prava su potvrda bogatstva leksičkog fonda engleskog jezika. Pri tom se naročito misli na brojne specifične upotrebe i značenja leksičkih jedinica u različitim specijalizacijama medicinske nauke i prakse.

Savlađujući materijal koji je ovde izložen, inventivan nastavnik ali i raspoložen i predan student shvatiće da tekstovi i testovi koji su im ponuđeni služe prvenstveno olakšavanju rada na rečniku engleskog jezika, ali da pri angažovanom i umešnom korišćenju mogu i te koliko da doprinesu obnavljanju i utvrđivanju znanja o njegovim karakterističnim strukturama i opštim osobinama. Upravo iz tog razloga tekstovi i nisu razvrstani ni po jednom od mogućih stručnih i metodoloških kriterijuma određivanja redosleda, već su poređani sasvim neutralno, po alfabetskom redosledu početnih reči naslova, s uverenjem da će biti shvaćeni kao ravnopravni delovi jedne velike celine, čijem se osvajanju neprestano težiti. Praktičan smisao takvog pristupa i takav način korišćenja materijala značili bi onda nagradu velikom trudu i opravdanje dobrim namerama koje su odredile njegovo prikupljanje, uobličavanje i izlaganje u elektronskoj formi, dostupnoj svima koji su zainteresovani.

Slobodan Jovanović

1 ACH drug intake and delirium

Elderly patients frequently use ACH drugs (those with anticholinergic properties) and they are expected to be particularly sensitive to central ACH side-effects. Although further studies are needed to unequivocally prove the link, ACH drugs are strongly suspected to have negative effects on cognition as well as on behavior in older persons. Cautious attitude suggests that physicians should be aware of ACH properties of drugs frequently prescribed in the elderly and that they should avoid such drugs, or at least, they should replace them with drugs that have less anticholinergic properties. Attention should be paid, especially in those patients who are supposed to be particularly prone to ACH drug side-effects because of dementia, polypharmacy, and burden of comorbidities.

Delirium, too, is a relatively common disorder; especially in older people with physical illness, it has a high morbidity and mortality and is often under-recognized and under-treated. Identifying risk factors for delirium, especially modifiable ones, is of great importance for the effective prevention of this condition. In recent decades, an increasing number of studies have examined the risk factors that might predispose, precipitate or perpetuate development and progression of delirium. Despite considerable methodological differences, most studies have found that ACH drugs may be a common risk factor for precipitating delirium in susceptible patients. Indeed, the association between ACH drug intake and delirium has a high biological plausibility, as suggested both by the theory that a central cholinergic deficit is to blame for delirium onset and by the evidence that a clinical correlation exists between SAA and delirium. At the moment, the most widely accepted theory is that delirium represents the clinical manifestation of a diffuse imbalance of cerebral neurotransmission. Probably, several neurotransmitters such as serotonin, noradrenaline, dopamine, are involved in the pathogenesis of delirium and any drug interfering with neurotransmission may therefore facilitate delirium onset. However, there are suggestions that the impaired cholinergic neurotransmission represents the final common pathway for the development of delirium.

So far, research findings are still controversial, but most published studies considered ACH drug use to be a precipitating factor. This is why, among other things, a consensus on a complete and updated list of ACH drugs is needed both for clinical and research purposes.

delirium

Delirium or acute confusion state is a common and severe neuropsychiatric syndrome. *Delirium*, most often caused by physical or mental illness, is usually temporary and reversible.

anticholinergic

Anticholinergic drugs are a group of bronchodilators that are different from the beta-agonists. *Anticholinergic* agents block the passage of impulses through the parasympathetic nerves.

unequivocally

unequivocal admits no doubt or misunderstanding, is clear and unambiguous. The company strive to make their product *unequivocally* the best in the industry.

dementia

Dementia is a serious loss of cognitive ability in a previously unimpaired person. *Dementia* is not a single disease, but rather a non-specific illness syndrome.

polypharmacy

polypharmacy comes from Greek root words: *poly*, many, and *pharmakeia* medicines or drugs. *polypharmacy* refers to administration of many drugs together.

comorbidities

Comorbidities are diseases or conditions that coexist with a primary disease. *Co-morbidities* of obesity include diabetes, hypertension, sleep apnea, chronic headaches,...

morbidity

In many cases, the terms disease, disorder, *morbidity* and illness are used interchangeably. Lumbar puncture, if improperly performed, may be followed by a significant *morbidity*.

mortality

Mortality data indicate numbers of deaths by place, time and cause. *Mortality rate* is a measure of the number of deaths in a population per unit time.

plausibility

plausible is something that is seemingly or apparently valid, likely, or acceptable; credible. In sociology *plausibility* structures are the sociocultural contexts of systems of meaning.

cholinergic

Cholinergic drugs produce the same effects as the parasympathetic nervous system. There are two main types of *cholinergic* receptors widely distributed throughout the brain.

diffuse

diffuse means to spread over/through as in air, water, esp. by fluid motion or passive means. Such a *diffuse* effort is unlikely to produce good results.

pathogenesis

The *pathogenesis* of a disease is the mechanism by which the disease is caused. Some notable *pathogenic* viruses cause smallpox, influenza, mumps, measles, ebola, rubella.

impaired

An *impaired* sense of smell means that the sense is diminished, damaged, or weakened. *Impaired* (drunk, or drugged) driving continues to be one of the deadliest crimes in America.

precipitating factor

precipitating factor is an element that causes or contributes to the occurrence of a disorder. A variety of *precipitating factors* have been implicated in triggering migraine attacks.

- **Can you make sentences of your own, explaining the meanings of:** *take in, intake, modify, modifiable, predispose, precipitate, perpetuate, correlation, pathway, consensus, consensual?*

2 Acting through chemical messengers

The endocrine system, along with the nervous system, functions in the regulation of body activities. The nervous system acts through electrical impulses and neurotransmitters to cause muscle contraction and glandular secretion. The effect is of short duration, measured in seconds, and localized. The endocrine system acts through chemical messengers called hormones to influence growth, development, and metabolic activities. The action of the endocrine system is measured in minutes, hours, or weeks and is more generalized than the action of the nervous system.

There are two major categories of glands in the body – *exocrine* and *endocrine*.

Exocrine glands have ducts that carry their secretory product to a surface. These glands include the sweat, sebaceous, and mammary glands, and the glands that secrete digestive enzymes.

Endocrine glands do not have ducts to carry their product to a surface. They are called ductless glands. The word endocrine is derived from the Greek terms “endo”, meaning within, and “krine”, meaning to separate or secrete. The secretory products of endocrine glands are called hormones and are secreted directly into the blood and then carried throughout the body where they influence only those cells that have receptor sites for that hormone.

Hormones are chemical substances that regulate metabolism, growth, and reproduction. Some hormones affect certain tissues and organs specifically and travel only short distances, producing their effects locally. Other hormones are transported in the blood stream to all parts of the body and produce a generalized effect. The organs affected are called target organs, which possess special receptors for the specific hormone.

Chemically, hormones fall into two main categories: *amino acid compounds* – these hormones are proteins or the related compounds also made up of amino acids. All hormones except those of the adrenal cortex and the sex glands fall into this category; *steroids* – these hormones are types of lipids derived from the steroid cholesterol. Steroid hormones are produced by the adrenal cortex and the sex glands. They can be recognized by the names ending in *-one*, as in *progesterone*, *testosterone*, etc.

glandular secretion

Cerumen, or earwax, is a *secretion* formed by a *gland* in the ear canal of most mammals. The glandular stomach has many gastric glands that secrete secretions called gastric juices.

exocrine glands

Exocrine glands are the counterparts to endocrine glands.

Typical exocrine glands include sweat glands, salivary glands, mammary glands, liver, ...

endocrine glands

Endocrine glands are glands that secrete their products, hormones, directly into the blood.

A hormone is secreted by a group of specialized cells called an *endocrine gland*.

sweat

Sweat is a clear, salty liquid produced by glands in the skin.

Sweating is how the body cools itself.

sebaceous

The *sebaceous* glands in the skin secrete an oily/waxy matter, called *sebum*.

Sebaceous cysts most often arise from swollen hair follicles.

mammary glands

A *mammary gland* is an organ in mammals that produces milk to feed young offspring.

Like hair, mammary glands are uniquely mammalian.

reproduction

The male and female *reproductive* systems are designed to create life.

In asexual reproduction, an individual reproduces without involvement with another individual.

amino acid

Amino acids play central roles as building blocks of proteins.

Amino acids are distinguished by shape and chemical properties of their side chains.

adrenal

In mammals, the *adrenal (suprarenal)* glands are endocrine glands that sit atop the kidneys.

Adrenal fatigue is supposedly a mild form of adrenal insufficiency caused by chronic stress.

cortex

The human cerebral cortex is 2-4 mm (0.08-0.16 inches) thick.

The cerebral cortex is constituted of up to six horizontal layers.

sex glands

Sex glands or *gonads* are organs that produce gametes, especially a testis or an ovary.

The *accessory sexual glands* originate from two epithelial tissues.

cholesterol

Cholesterol is a waxy steroid of fat that is produced in the liver or intestines.

Cholesterol is a fat (lipid) which is crucial for normal body functioning.

progesterone

Progesterone belongs to a class of hormones called *progestogens*.

Progesterone is involved in the female menstrual cycle and pregnancy (supports *gestation*).

testosterone

Testosterone is a steroid hormone from the androgen group.

A testosterone test measures the level of this male hormone (androgen) in the blood.

- **Think up your own sentences with:** *messengers, duration, digest, digestive, local, locally, target, to target, receive, receptors.*

3 All the unpleasantness had gone...

As the days passed, I just couldn't get better beyond a certain point. Every time Colin reduced the dose of our dwindling store of antibiotics, my stomach would swell up in taut protest. He had to raid the supply in the emergency barrel. I seemed a travesty of the fit woman who had been hauling up sails only a week ago. My stomach had now swollen up like a balloon. The skin was all shiny and hurt from stretching suddenly. It was almost impossible to empty my bladder. Dimly I realized that what I was having was something which ashore would mean a blood transfusion and a few days in hospital...

Two hours later I was lying on my back on a cool high bed, while Dr Mario Vascolelos, who seemed pleased when he learned we had named our son after him, talked to Colin. Nurses rushed around taking my temperature and blood pressure. Dr Mario smilingly told me in broken English to relax while he made a thorough examination. Then a smiling nurse in pink came in with an injection served on a silver salver. In a few minutes I began to feel pleasantly dizzy. Then she dressed me in a surgical gown finer than any clothes I had of my own; and they wheeled me briskly down in a trolley to the operating theatre while I stared at the squares on the ceiling...

I woke up back in my room to the sound of torrential tropical rain crashing down from the huge green leaves which hung outside my window. Soon a nurse came and poured bright pink disinfectant between my legs and washed me with cotton wool held by a long pair of rather sinister-looking tongs. Already I felt a bit better. Then another nurse came and gave me an injection.

Four days later, the only thing about me which wasn't working properly was my tongue – which still couldn't get the hang of Portuguese. A charming French-speaking doctor explained that the trouble I had had at sea had been a miscarriage brought on by the intra-uterine coil which I had had fitted in Sydney. I could have died if we had continued on to England without stopping; or at least severely damaged my kidneys. The only way of ensuring that the bleeding and infection would stop had been by scraping the womb and giving me powerful injections of chloramphenicol. The doctor told me that I had just had the same operation as you have to have an abortion. I wondered what all the fuss was about. All the unpleasantness had been before. I really sympathized with the thousands of other women who must have these problems.

dwindling store

to dwindle means to become steadily less, to shrink.

We are borrowing against the world's *dwindling store* of inexpensive energy.

taut

A *taut* object is one under *tension*.

When one is emotionally or mentally strained or tense, his nerves are *taut*.

barrel

A *barrel* or cask is a hollow cylindrical container, traditionally made of vertical wooden staves.

A *barrel* is one of several units of volume, with *dry barrels*, *fluid barrels*, *oil barrel*, etc.

travesty

Travesty is the word used to denote generally an absurd or grotesque misrepresentation.

Travesti (in theatre) means the portrayal of a character by a performer of the opposite sex.

thorough

A *thorough* search is a one executed without negligence or omissions.

He went out in the rain and came back *thoroughly* drenched.

salver

A *salver* is a flat tray of silver used for the presenting of a letter or card by a servant.

salver is an alteration of French *salve*, from Spanish *salva*, *tasting of food to detect poison*.

dizzy

dizziness refers to an impairment in spatial perception and stability.

Causes of *dizziness* include: low/high blood pressure, heart conditions, migraine, brain tumor,...

trolley

trolley is a wheeled vehicle that runs on rails and is propelled by electricity.

trolley is a bed on casters, used for moving patients who are unconscious, immobilized, etc.

operating theatre

operating theatre is a room in which surgical operations are performed.

An *operating theater/theatre* was a non-sterile, tiered theater or amphitheater in which students and other spectators could watch surgeons perform surgery.

tongs

tongs are used for gripping and lifting tools.

There are many forms of *tongs*, adapted to their specific use.

miscarriage

miscarriage (*spontaneous abortion*) is any pregnancy ending before the fetus can survive.

What are the symptoms of a *miscarriage* and what does it mean for future fertility?

coil

Coils are often coated with varnish and/or wrapped with insulating tape.

A *random coil* is a polymer conformation where the monomers are arranged at random.

scraping

scrape means to remove from a surface by forceful strokes of an edged or rough instrument.

scrape is an abrasion or cut caused by something rubbing roughly against the skin.

womb

The *womb* (*uterus*) is a hollow, pear-shaped organ located in a woman's lower abdomen.

womb is the place in which anything is formed or produced: the *womb* of time.

- **Now you make examples, using:** *dose, swell up, swollen, stretch, stretching, broken English, gown, disinfect, disinfectant, chloramphenicol, abort, abortion.*

4 Anaesthesia

The word *anaesthesia* was first used by the American physician, professor, lecturer, and author Oliver Wendell Holmes, Sr. (1809–1894) in 1846. It is based on Greek words meaning 'lack of sensation', but in suitable concentrations *anaesthetics* also cause a reversible depression of the normal activities of practically all cells from brain cells to amoebae.

The mode of action of anaesthetics is still a matter of debate. When different substances are compared it is convenient to calculate the results in terms of what the physical chemists call the thermodynamic activity, which is almost the same thing as the percentage saturation (either in a liquid or a vapour). Under conditions of equilibrium, this thermodynamic activity is the same in all parts of a complex mixture such as a cell and its surroundings. It is often found that a given anaesthetic effect is produced by different substances at about the same level of thermodynamic activity, so that if the concentrations are all expressed in these terms most of the differences between different anaesthetics disappear. The pharmacological activity depends on the amount of anaesthetic that has to be used to get a given effect. It follows from this that substances with a high boiling point are likely to be particularly active as vapours, and that substances which are not very soluble in water are likely to be particularly active when added to water. The active anaesthetics are usually very soluble in lipoids and it is suggested that their action is due to accumulation in the lipoids of the cells.

When tissues are anaesthetized they lose weight. This has been attributed to a fall in the affinity of their colloids for water, and put forward as the fundamental change in anaesthesia. Anaesthetics penetrate cells easily and have been observed to cause changes in viscosity in their interior, but anaesthesia is not produced by the injection of anaesthetics inside cells, and is therefore probably due to an effect on the plasma membrane which bounds the cell and is rich in lipoids. Anaesthetics usually depress the oxygen uptake of tissues, and the enzymes which oxidize carbohydrates are particularly sensitive to their action. The oxidation of carbohydrates by slices of brain is inhibited by concentrations of anaesthetic similar to those present in the whole animal during anaesthesia. It has been suggested that this effect is the cause of anaesthesia, and that the brain is particularly sensitive to anaesthetics because it is particularly dependent on carbohydrate metabolism.

anaesthesia

anaesthesia is a pharmacologically induced and reversible state of amnesia and analgesia. An alternative definition is a "reversible lack of awareness," including a total lack of awareness.

anaesthetics

anesthetic/anaesthetic is a drug that causes *anaesthesia/anaesthesia*.

Synthetic local anesthetics are structurally related to cocaine.

thermodynamic

Thermodynamics describes how systems change when they interact with one another.

thermodynamic systems relate to physical properties of material bodies and radiation.

saturation

the state of *saturation* of a fluid indicates that the fluid is at its boiling point temperature.

A saturated steam is steam at equilibrium with liquid water.

pharmacological

pharmacology is the branch of medicine and biology concerned with the study of drug action.

The two main areas of pharmacology are pharmacodynamics and pharmacokinetics.

lipoids

Lipoid nephrosis is the earliest stage of nephrosis, the nephrotic syndrome of childhood.

Inhaling oily substances can lead to a serious *lipoid pneumonia*.

affinity

affinity indicates some kind of preference, a potential or actual closeness between two entities.

affinity relates to the strength of binding interaction between antigen and antibody molecules.

colloids

A *colloid* is a substance microscopically dispersed evenly throughout another substance.

Learn how to distinguish between solutions, suspensions, *colloids*, and dispersions!

viscosity

Viscosity is an internal property of a fluid that offers resistance to flow.

Viscosity varies from liquid to liquid, and is affected by temperature.

plasma

In physics and chemistry, *plasma* is a state of matter similar to gas.

Blood plasma is the straw-colored liquid component of blood.

uptake

uptake refers to movement from an area of high water potential, to that of low water potential.

uptake can also refer to osmosis, a special type of diffusion applying only to water.

enzymes

Enzymes are proteins that catalyze (i.e., increase the rates of) chemical reactions.

Enzymes have interesting properties that make them little chemical-reaction machines.

inhibit

inhibit, in chemistry, means to *prevent* or *decrease* the rate of (a reaction).

Inhibition Theory is a psychological theory pertaining to the performance of a mental task.

metabolism

Metabolism is the set of chemical reactions that happen in living organisms to sustain life.

In humans, metabolism naturally slows about 5 per cent per decade after age 40.

- **What about making some examples with:** *physician, chemists, liquid, equilibrium, mixture, boiling point, membrane, slices, amoebae, soluble, reversible, depression, vapour?*

5 Antioxidants could be doing more harm than good

Antioxidants are substances or nutrients in our foods which can prevent or slow the oxidative damage to our body. When our body cells use oxygen, they naturally produce free radicals, by-products which can cause damage. Antioxidants act as “free radical scavengers” and hence prevent and repair damage done by these free radicals. Health problems such as heart disease, macular degeneration, diabetes, cancer are all contributed by oxidative damage. Antioxidants may also enhance immune defense and therefore lower the risk of cancer and infection. Among the most commonly known antioxidants are vitamin A and carotenoids, vitamin C, vitamin E, selenium. So how could antioxidants be doing more harm than good?

Antioxidant overload could be behind diseases such as inherited heart problems and Alzheimer's, a study claims. Until now, the compounds – found in fruit and vegetables – have been lauded as beneficial to our health. They neutralise free radicals, the destructive groups of atoms that cause other atoms to lose electrons, damaging cells and DNA, in a process known as oxidative stress. Many serious disorders, ranging from heart disease to cancer, are wholly or partly blamed on free radicals.

Scientists, however, believe now that there is a flip side to the coin. They say that high levels of antioxidants could make atoms gain electrons, in a process called reductive stress – causing untold damage. The U.S. researchers were studying mice carrying a human mutation linked to weakened skeletal and heart muscle. The mice developed similar symptoms to those seen in human patients, such as heart enlargement and progressive heart failure. The scientists suspected that oxidative stress levels were responsible. But to their surprise, the mutant mice were in fact producing excess amounts of a natural antioxidant called glutathione, which appeared to be generating reductive stress.

Study leader Dr Ivor Benjamin says that there has been so much emphasis on free radicals to the exclusion of the potential consequences of reductants, and that this study provides the first *bona fide* example of the role that reductive stress can play in disease. Dr Benjamin and his team believe that there may also be implications for human neurodegenerative diseases such as Alzheimer's and Huntington's.

antioxidants

Antioxidants are substances that may protect cells against the effects of free radicals. *Antioxidants* are believed to lower the risk of cancer, heart disease, and memory loss. *Antioxidants* in foods are important for our health.

radicals

A *radical* (chemistry) is an atom, molecule, or ion that is likely to take part in chemical reactions. *Radical consonants* are the ones articulated with the root (base) of the tongue in the throat.

by-products

by-product is a secondary product derived from a manufacturing process or chemical reaction. Meat *by-products* are clean parts of slaughtered animals, not including meat.

scavengers

Scavengers are animals that feed on dead or injured animals. *Scavengers* are those carnivorous animals that eat *carrion* (already dead animals). Cockroaches, *scavengers*, eat all kinds of materials – paper, clothing, dead animals, plants.

enhance

enhance means to raise to a higher degree, to intensify, to magnify. Hobbies also *enhance* self-esteem and self-confidence. Rarity *enhances* the worth of old coins.

carotenoids

Carotenoids are a large group of fat soluble pigments widely distributed in plants and animals. Food sources of *carotenoids* include carrots, sweet potatoes, spinach, kale, tomatoes. Women who eat a diet rich in *carotenoids* have substantially lower risk of breast cancer.

selenium

Selenium is a trace mineral that is essential to good health but required only in small amounts. The amount of *selenium* in food depends on where it is grown or raised. *Selenium* works as an antioxidant, especially when combined with vitamin E.

mutation

In molecular biology and genetics, *mutations* are changes in a genomic sequence. A *mutation* is a change in DNA, the hereditary material of life. *Mutations* are caused by radiation, viruses, transposons and mutagenic chemicals.

glutathione

Glutathione, also called GSH, is a very special peptide molecule. The critical role played in our body by *glutathione* (*GSH*) has been proven by science.

bona fide

bona fide is sth. made or carried out in good faith, something sincere. *bona fide* is also something authentic, true.

implications

Logical implication is an entailment, or consequence, a relation between statements. His *implication* of immediate changes surprised us. An *implication* is sth. implied, suggested as naturally to be inferred, understood.

- **You could make some additional examples, using:** *nutrients, macula, macular degeneration, load, overload, laud, lauded, neutralize, flip side, weak, weaken, weakened.*

6 Area equal to one side of a tennis court!

The human lungs are the organs of respiration in humans. Humans have two lungs, with the left being divided into two lobes and the right into three lobes. Together, the lungs contain approximately 2,400 km (1,500 mi) of airways and 300 to 500 million alveoli, having a total surface area of about 70 square metres (8,4 x 8,4 m) in adults – roughly the same area as one side of a tennis court. Furthermore, if all of the capillaries that surround the alveoli were unwound and laid end to end, they would extend for about 992 km (620 mi). Each lung weighs 1.1 kilograms (2.5 pounds), therefore making the entire organ about 2.3 kilograms (5 pounds).

The conducting zone contains the trachea, the bronchi, the bronchioles, and the terminal bronchioles. The respiratory zone contains the respiratory bronchioles, the alveolar ducts, and the alveoli. The conducting zone and the respiratory stuffers (but not the alveoli) are made up of airways. The conducting zone has no gas exchange with the blood, and is reinforced with cartilage in order to hold open the airways. The conducting zone warms the air to 37 degrees Celsius and humidifies the air. It also cleanses the air by removing particles via cilia located on the walls of all the passageways. The lungs are surrounded by the rib cage. The respiratory zone is the site of gas exchange with blood.

The sympathetic nervous system, via noradrenaline acting on the beta receptors, causes bronchodilation. The parasympathetic nervous system via acetylcholine, which acts on the M-1 muscarinic receptors, maintains the resting tone of the bronchiolar smooth muscle. This action is related, although considered distinct from bronchoconstriction. Many other non-autonomic nervous and biochemical stimuli, including carbon dioxide and oxygen, are also involved in the regulation process. The pleural cavity is the potential space between the parietal pleura, lining the inner wall of the thoracic cage, and the visceral pleura lining the lungs. The lung parenchyma is strictly used to refer solely to alveolar tissue with respiratory bronchioles, alveolar ducts and terminal bronchioles. However, it often includes any form of lung tissue, also including bronchioles, bronchi, blood vessels and lung interstitium.

Diseases of the human lung belong to respiratory diseases. Many of such are caused or worsened by smoking. Lung disorders are generally handled by general practitioners, although patients may be referred to a pulmonologist.

trachea

The trachea or windpipe is a cartilaginous and membranous tube.

The trachea connects the “voice box” (larynx) with the bronchial parts of the lungs.

bronchi, bronchioles

A *bronchus* is a passage of airway in the respiratory tract that conducts air into the lungs.

The *bronchioles* or *bronchioli* are the first airway branches that no longer contain cartilage.

cilia

A *cilium* (Latin for *eyelash*; pl. *cilia*) is an organelle found in eukaryotic cells.

The trachea is lined with *cilia*, which sweep fluids and foreign particles out.

sympathetic

The *sympathetic* nervous system (SNS) is part of the autonomic nervous system (ANS).

A *sympathetic* glance expresses feeling, or results from sympathy.

noradrenaline

Noradrenaline is found in the human body, and is also manufactured synthetically.

Noradrenaline is also called *norepinephrine*, especially by those in the medical field.

bronchodilation

Bronchodilation is the process by which the bronchi are dilated.

A *bronchodilator* is a substance that dilates the bronchi and bronchioles.

parasympathetic

The *parasympathetic* nervous system (PSNS) is one of the two main divisions of the ANS.

The main nerves of the PSNS are the tenth cranial nerves, the vagus nerves.

acetylcholine

The chemical compound **acetylcholine** is a neurotransmitter in both the PNS and CNS.

Acetylcholine is also the principal neurotransmitter in all autonomic ganglia.

bronchoconstriction

Bronchoconstriction is narrowing of air passages of the lungs from smooth muscle contraction.

Bronchoconstriction leads to symptoms such as coughing, wheezing, and shortness of breath.

pleural cavity

The pleural cavity is a closed space (“inside of a balloon”) within which the lung has grown.

The lungs fill the pleural cavities and are divided into lobes.

parietal pleura

The parietal pleura lines the inner chest walls and covers the diaphragm.

The *parietal pleura* is highly sensitive to pain.

visceral pleura

The *visceral pleura* dips into the fissures of the lungs.

Visceral pleura can be damaged by asbestos exposure.

thoracic cage

The human *rib cage* is also known as the *thoracic cage*.

Thoracic cage, or *rib cage*, protects the heart, lungs and major blood vessels in the chest.

parenchyma

Parenchyma is the most common plant tissue.

Parenchyma is the tissue characteristic of an organ.

interstitium

Interstitial fluid (tissue fluid) is a solution that surrounds the cells of multicellular animals.

interstitium specifically relates to the tissue between the pulmonary alveoli and the bloodstream.

- **You should try now to explain the meanings of:** *lungs, lobes, respiratory, airways, alveoli, capillaries, cartilage, surround, unobstructed, ducts, cilia, reinforced, cleanse, rib cage, particles, stimuli, regulation, pulmonologist.*

7 A big global public health problem

Cervical cancer represents an important global public health problem, as it is a common cause of death in women and is attributable to human papillomavirus (HPV) infection. The Pap smear has been appropriately hailed as a landmark achievement of cancer prevention; its ability to detect cellular abnormalities has resulted in the reduction of incidence and mortality from cervical cancer. This advance led to a greater emphasis being given to prevention of this cancer. Keys to this success have included the recognition that high-grade dysplasia and its cytological counterpart represent the main precursor to invasive cervical cancer. Regular Pap smear screening can identify most of these pre-cancerous lesions and the treatment of these lesions can effectively cure them, thereby greatly reducing the risk of cervical cancer.

Despite this success, two limitations of the Pap smear exist: (1) false-negative results leading to the need for repeat screening at relatively short intervals; and (2) cervical cancer screening, based on the Pap smear, remains beyond the economic resources of nations in the developing world. This economic disparity has meant that cervical cancer incidence and mortality rates in the developing world have remained high, with large reductions in these rates being limited primarily to the industrialized world. Consequently, about 80% of cervical cancers now occur in developing nations, where it is frequently the most common cause of death from cancer in women. Thus, the reduction of cervical cancer in developing nations remains an unmet need of high priority.

In addition to the Pap smear, the recognition that virtually all cases of cervical cancer are attributable to infection by a subset of HPVs represents another pioneering achievement. The link to HPV was initially suggested from histologic analysis of cervical lesions. This hypothesis was given a firm molecular basis through discovery and molecular cloning of HPV-16 and HPV-18, identification of these HPV DNAs in the majority of cervical cancers, and finding that the HPV E6 and E7 genes were preferentially retained and expressed in cervical cancer cell lines. Epidemiologic studies validated the notion that HPV infection is the primary cause of close to 100% of cervical cancers. The availability of molecularly cloned HPV DNA genomes has enabled a wealth of research providing insight into basic aspects of HPV and the relationship between HPV infection and cervical cancer, as well as the role of HPV in other genital tumors and oropharyngeal cancer.

cervical cancer

Cervical cancer is malignant neoplasm of the cervix uteri or cervical area. HPV infection is a factor in the development of almost all cases of cervical cancer.

attributable

Alcohol-attributable deaths vary by age.

The psychotherapist *attributed* his problem to an unhappy childhood.

human papillomavirus (HPV)

HPV is a member of the papillomavirus family of viruses that is capable of infecting humans. Papillomaviruses affect a wide variety of animals.

smear

smear (n.) is a spot made by or as if by an unctuous or adhesive substance.

A *smear test* usually refers to a Pap test.

dysplasia

dysplasia is a term used in pathology to refer to an abnormality of development.

Cervical *dysplasia* is caused by HPV (human papillomavirus infection).

disparity

Health *disparities* refer to differences between groups of people.

Binocular *disparity* results from the eyes' horizontal separation.

subset

In mathematics, esp. in set theory, a set A is a *subset* of a set B if A is 'contained' inside B.

Every set is a *subset* of itself, and the empty set is a *subset* of every other set.

pioneering

pioneer is a one who opens up new areas of thought, research, or development.

You must know first aid for injuries/illness that can occur while working on *pioneering* projects.

histologic

Histology is the study of the microscopic anatomy of cells and tissues of plants and animals.

Histological section refers to thin slices of tissue applied to a microscopic slide.

hypothesis

Any useful *hypothesis* will enable predictions by reasoning, including deductive reasoning.

A *hypothesis* is an "educated guess".

genomes

In modern genetics, the *genome* is the entirety of an organism's hereditary information.

The human *genome* is the *genome* of Homo sapiens.

genital

Genital warts is a highly contagious sexually transmitted disease.

Genital HSV-2 infection is more common in women than it is in men.

tumors

Tumors appear to occur when there is a problem with the dividing of cells in the body.

Tumors are abnormal growths in the body, made up of extra cells.

oropharyngeal cancer

Oropharyngeal cancer typically involves patients in the fifth through seventh decades of life.

Oropharyngeal cancer affects the tonsil area and the back of the tongue.

- **Now you try to give some examples of your own using:** *Pap smear, hailed, landmark, emphasis, counterpart, precursor, invasive, limitations, unmet, priority, aspects.*

8 The body ached dully...

You are about to awaken when you dream that you are dreaming.

During the next two days Bond was permanently in this state without regaining consciousness. He watched the procession of his dreams go by without making any effort to disturb their sequence, although many of them were terrifying and all were painful. He knew that he was in a bed and that he was lying on his back and could not move and in one of his twilight moments he thought there were people round him; but he made no effort to open his eyes and reenter the world.

When he awoke again some hours later all his terrors had gone, and he felt warm and languorous. He closed his eyes and mentally explored his body. The worst pain was in his wrists and ankles and in his right hand where they had cut him. In the centre of the body there was no feeling. He assumed that he had been given a local anaesthetic. The rest of his body ached dully as if he had been beaten all over. He could feel the pressure of bandages everywhere, and his unshaven neck and chin prickled against the sheets. From the feel of the bristles he knew that he must have been at least three days without shaving. That meant two days since the morning of the torture. He was preparing a short list of questions in his mind when the door opened and the doctor came in followed by a nurse.

– You're in a nursing home at Royale and I've been sent over from England to look after you. You've been unconscious since they brought you in, and we've been quite worried. Your own injuries are serious, but your life is not in danger though you have lost a lot of blood. If all goes well, you will recover completely and none of the functions of your body will be impaired. – The doctor smiled grimly. – But I fear that you will continue to be in pain for several days, and it will be my endeavour to give you as much comfort as possible. Now that you have regained consciousness your arms will be freed, but you must not move your body; and when you sleep the nurse has orders to secure your arms again. Above all, it is important that you rest and regain your strength. At the moment you are suffering from a grave condition of mental and physical shock. – The doctor paused. – For how long were you maltreated?

Bond explained briefly what had happened up to the moment of Le Chiffre's death, omitting all but the most essential details. It cost him an effort, and he was glad when it was done. Casting his mind back to the scene awoke the whole nightmare, and the sweat began to pour off his forehead and a deep throb of pain started up in his body.

ache

After running the marathon, his body ached for a week.

The candy was so sweet that it made my teeth ache.

dully

The *dull* knife just bounced off the skin of the tomato without cutting it.

He was often mistaken for a *dullard* because he never said much in discussions.

consciousness, unconscious

The medication caused her to enter an altered state of consciousness.

Having lost consciousness he was unconscious for three days.

languorous

The drummer's languorous playing caused the rest of the band to miss the beat.

They enjoyed the *languor* brought on by a hot summer afternoon.

wrists

The hand has several bones to include the *wrist*, palm, and fingers.

The wrist is surrounded by a band of fibrous tissue that functions as a support for the joint.

ankles

The ankle joint is the meeting of the bones of the leg and the foot.

Ankle pain is commonly due to a sprain or tendinitis.

injuries

Head injuries are rather frequent causes of death and disability.

Dental injuries range from a chipped or fractured tooth to a knocked out tooth.

impaired

Many disease processes can impair the pumping efficiency of the heart.

Autism in children and adults is characterized by impaired development in communication.

comfort

A chocolate cake is a favorite comfort food for both kids and adults.

In case of infectious mononucleosis, comfort measures are all that is necessary.

grave

He is in a very grave condition now, after three failed operations.

Prenatal diagnosis of aqueductal stenosis carries a grave prognosis.

shock

Shock is a grave condition that occurs when the body is not getting enough blood flow.

Acute stress reaction is often termed "shock" by laypersons.

maltreated

She was emotionally maltreated and neglected by her husband for years.

The prisoners complained of having been maltreated by the warden.

sweat

Sweat is a clear, salty liquid produced by glands in your skin.

If there's one thing many people really can't stand, it's excessive sweating.

throb

The heart throbs under the influence of strong emotion or excitement.

All of a sudden, he throbbed at the happy thought.

- **Can you give some sentences to illustrate the meanings of:** *awaken, twilight, regain, painful, bristles, prickle, recover, secure, nightmare, state, mentally explore, bandages, permanently?*

9 The body's largest organ

The skin is the outer covering of the body. In humans, it is the largest organ of the integumentary system. The skin has multiple layers of ectodermal tissue and guards the underlying muscles, bones, ligaments and internal organs. Human skin is similar to that of most other mammals, except that it is not protected by a pelt. The adjective cutaneous literally means “of the skin” (from Latin *cutis*, skin). Because it interfaces with the environment, skin plays a key role in protecting (the body) against pathogens and excessive water loss. Its other functions are insulation, temperature regulation, sensation, synthesis of vitamin D, and the protection of vitamin B folates. Severely damaged skin will try to heal by forming scar tissue. This is often discolored and depigmented. In humans, skin pigmentation varies among populations, and skin type can range from dry to oily. Such skin variety provides a rich and diverse habitat for bacteria which number roughly at 1,000 species from 19 phyla.

Skin has mesodermal cells, pigmentation, or melanin provided by melanocytes, which absorb some of the potentially dangerous ultraviolet radiation (UV) in sunlight. It also contains DNA-repair enzymes that help reverse UV damage, and people who lack the genes for these enzymes suffer high rates of skin cancer. One form predominantly produced by UV light, malignant melanoma, is particularly invasive, causing it to spread quickly, and can often be deadly. Human skin pigmentation varies among populations in a striking manner. This has led to the classification of people(s) on the basis of skin color. There are at least five different pigments that determine the color of the skin. These pigments are present at different levels and places: *Melanin* is brown in color and present in the germinative zone of the epidermis; *Melanoid* resembles melanin but is present diffusely throughout the epidermis; *Carotene* is yellow to orange in color. It is present in the stratum corneum and fat cells of dermis and superficial fascia; *Hemoglobin* (also spelt Haemoglobin) is found in blood and is not a pigment of the skin but develops a purple color; *Oxyhemoglobin* is also found in blood and is not a pigment of the skin. It develops a red color.

The skin is the largest organ in the human body. For the average adult human, the skin has a surface area of between 1.5-2.0 square metres (16.1-21.5 sq ft.); most of it is between 2-3 mm (0.10 inch) thick. The average square inch (6.5 cm²) of skin holds 650 sweat glands, 20 blood vessels, 60,000 melanocytes, and more than 1,000 nerve endings.

integumentary

The *integumentary* system contains the largest organ in the human body, the skin. The integumentary system has multiple roles in homeostasis, including temperature regulation.

ectodermal

ectoderm is the outer germ layer in the embryo of a metazoan.

Ectodermal dysplasia is not a single disorder, but a group of syndromes.

pelt

pelt refers to the skin of an animal with the fur or hair still on it.

Gotland Pelt is a breed of domestic sheep.

cutaneous

The adjective *cutaneous* means “of the skin” (from Latin *cutis*, skin).

In *cutaneous candidiasis*, the skin is infected with *candida* fungi.

pathogens

Bacteria that cause disease are called *pathogenic* bacteria.

Understanding of the biology of pathogens and pathogen-host interactions is very important.

folates

folates are B-vitamin nutrients found in oranges, legumes, leafy green vegetables, ...

Folate deficiency may cause depression, muscular and mental fatigue, states of confusion, ...

mesodermal

A common stem cell is known to produce both neural plate and mesoderm.

The process of mesodermal specification is controlled by extracellular signalling molecules.

melanin

Melanin is a natural substance that gives color (pigment) to hair, skin, and the iris of the eye.

Melanin is produced in the pineal gland.

melanocytes

Melanocytes are special cells in skin located in its outer surface epidermis.

Melanocytes modulate skin color in response to stress.

malignant melanoma

Melanoma is usually caused by damage from UV light from the sun, or from sunbeds.

Melanoma can occur in any part of the body that contains melanocytes.

germinative

germinative layer is the innermost layer of the epidermis.

New tissue is constantly formed from the germinative layer.

carotene

carotene is any of three yellow or orange fat-soluble pigments having the formula $C_{40}H_{56}$.

Carotene is found in many plants, especially carrots, and transformed to vitamin A in the liver.

stratum corneum

stratum corneum is the outer, more or less horny, part of the epidermis.

Stratum corneum consists chiefly of layers of dead non nucleated cells filled with keratin.

dermis

dermis is the dense inner layer of skin beneath the epidermis.

Dermis contains nerve endings, sweat and sebaceous glands, blood and lymph vessels.

fascia

fascia refers to a band or sheath of connective tissue.

Inflammation of the fascia is referred to as fasciitis.

- **Try to make sentences illustrating different meanings of:** ligaments, insulation, sensation, interfaces, synthesis, scar, depigmented, pigmentation, absorb, ultraviolet radiation (UV), diffusely, invasive, adult, sweat, sweat glands.

10 Causes of axon damage in MS

Central to the development of therapies for multiple sclerosis (MS) is a precise understanding of the temporal cascade of pathological events. Traditionally, acute inflammatory attack on myelin has been thought to be the primary event in disease pathogenesis. It was assumed that inflammation is the precursor to the entire natural history of the disease and that progression occurs directly because of previous or ongoing inflammation. Thus, the driving dogma of MS therapy has been to prevent relapses by immunosuppressive therapies. However, the epidemiological data presented and other observations on the disease have prompted a re-evaluation of this hypothesis, and it has been suggested by some that a neurodegenerative process may be the primary pathological event.

Evidence concerning the likely causes of axon loss comes from a variety of sources. Pathological studies have the advantage of being able to define precise mechanisms occurring in tissue, but have the disadvantage of only taking a ‘snap-shot’ of what may be occurring at a given time. Furthermore, the length of axons within the central nervous system and the complexity of interactions make for difficulty in determining the environment of the axon throughout its entire length. In other words, degeneration of the axon may occur some distance away from a specific insult, making correlations between pathological processes difficult. Epidemiological studies of cohorts of patients with the disease and those exposed to specific therapies resolve some of the issues concerning disease processes occurring through the course of the disease, but of course lack precise tissue analysis. Experimental models are widely used and may overcome many of these issues, but application to human disease is at best not straightforward and at worst wholly misleading.

The degree to which inflammation within the central nervous system produces axon damage in MS is of great interest. Studies showed high levels of axonal amyloid precursor protein (APP) accumulation within acute active lesions and the borders of chronic active lesions. Axonal transection was also seen in the borders of chronic active lesions and in the center of these lesions, to a lesser extent. As higher levels are seen within active lesions, it has been postulated that inflammation *per se* is responsible for axonal pathology to a large extent. However, attempts to correlate inflammation and axonal pathology have suggested that this formulation may be too simplistic.

cascade

cascade refers to a waterfall or a series of small waterfalls over steep rocks.

cascade also refers to a chemical or physiological process that occurs in successive stages.

myelin

Myelin forms a layer, the *myelin sheath*, usually around only the axon of a neuron.

Myelin considerably increases the speed that nerve signals (impulses) move down the axons.

precursor

Precursor precedes and indicates, suggests, or announces someone or something to come.

Colonial opposition to unfair taxation by the British was a *precursor* of the Revolution.

ongoing

The *ongoing* issue cannot be resolved easily.

The term *ongoing series* contrasts *limited series* (to end after a certain number of issues).

dogma

Dogma is the established belief, doctrine held by a religion, or a particular group/organization.

Dogma is always authoritative and not to be disputed, doubted, or diverged.

immunosuppressive

Immunosuppression involves an act reducing the activation or efficacy of the immune system.

Immunosuppression after solid organ transplantation is complex.

Immunosuppressive drugs are necessary in adults receiving kidney transplants.

complexity

complexity is used to characterize something with many parts in intricate arrangement.

The components of a *complex* cannot be separated without destroying it.

The aspects of distinction and connection determine two dimensions characterizing *complexity*.

straightforward

Teachers are seldom satisfied with *straightforward* “yes” or “no” answers to their questions.

At that moment she gave him a *straightforward* gaze.

misleading

Misleading is something designed to deceive or *mislead* either deliberately or inadvertently.

Manufacturers often use *misleading* brand names, logos and slogans.

Misleading vividness is a term applied to anecdotal evidence describing an occurrence.

amyloid

Amyloids are insoluble fibrous protein aggregates sharing specific structural traits.

Amyloidosis refers to a variety of conditions whereby the body produces “bad proteins”.

transection

Multiple Subpial *Transection* (MST) is a treatment for epileptic seizures.

Optic nerve *transection* is a widely used model of adult CNS injury.

postulated

postulate can mean to contend, to maintain, or to assert.

Supersymmetric theories *postulate* that every particle has a massive ‘shadow’ particle partner.

simplistic

simplistic refers to the tendency to oversimplify an issue/problem by ignoring complexities.

When something is *simplistic*, it is simple to a fault, excessively simple.

simplistic implies *simplicity* that distorts the topic.

- **It should not be too difficult now to give own examples with:** *precise, precision, prompt, prompted, likely, long, length, lengthy, distance, distant.*

11 The center of the human nervous system

Enclosed in the cranium, the human brain has the same general structure as that of other mammals, but is over three times larger than the brain of a typical mammal with an equivalent body size. Most of the spatial expansion comes from the cerebral cortex, a convoluted layer of neural tissue which covers the surface of the forebrain. Especially expanded are the frontal lobes, associated with executive functions such as self-control, planning, reasoning, and abstract thought. The portion of the brain devoted to vision, the occipital lobe, is also greatly enlarged in human beings.

Brain evolution, from the earliest shrew-like mammals through primates to hominids, is marked by a steady increase in encephalization, or the ratio of brain to body size. Estimates vary for the number of neuronal and non-neuronal cells contained in the brain, ranging from 80 or 90 billion ($\sim 85 \cdot 10^9$) non-neuronal cells (glial cells) and an approximately equal number ($\sim 86 \cdot 10^9$) of neurons, of which about 10 billion (10^{10}) are cortical pyramidal cells, to over 120 billion neuronal cells, with an approximately equal number of non-neuronal cells. These cells pass signals to each other via as many as 1,000 trillion (10^{15} , 1 quadrillion) synaptic connections. Due to evolution, however, the modern human brain has been shrinking over the past 28,000 years.

The brain continuously receives sensory information, and rapidly analyzes this data and then responds accordingly by controlling bodily actions and functions. The brain stem controls breathing, heart rate, and other autonomic processes that are independent of conscious brain functions. The neocortex is the center of higher-order thinking, learning, and memory. The cerebellum is responsible for the body's balance, posture, and the coordination of movement.

Despite being protected by the thick bones of the skull, suspended in cerebrospinal fluid, and isolated from the bloodstream by the blood-brain barrier, the human brain is susceptible to many types of damage and disease. The most common forms of physical damage are closed head injuries such as a blow to the head, a stroke, or poisoning by a wide variety of chemicals that can act as neurotoxins. Infection of the brain, though serious, is rare due to the biological barriers which protect it. The human brain is also susceptible to degenerative disorders, such as Parkinson's disease, multiple sclerosis, and Alzheimer's disease. A number of psychiatric conditions, such as schizophrenia and depression, are thought to be associated with brain dysfunctions, although the nature of such brain anomalies is not well understood.

cerebral cortex

The cerebral cortex is a sheet of neural tissue that is outermost to the cerebrum.

The cerebral cortex plays a key role in memory, attention, thought, language, consciousness...

frontal lobes

The frontal lobe is an area located at the front of each cerebral hemisphere.

The frontal lobes contain most of the dopamine-sensitive neurons in the cerebral cortex.

occipital lobe

The occipital lobe is the visual processing center of the mammalian brain.

The two occipital lobes are the smallest of four paired lobes in the human cerebral cortex.

shrew-like

shrew is a mouse-sized mammal with an elongated snout and a dense fur of uniform color.

Common shrews are one of Britain's and northern Europe's most abundant small mammals.

hominids

Hominids are a family (*Hominidae*) of erect bipedal primate mammals.

Hominidae includes four extant genera: chimpanzees, gorillas, humans, and orangutans.

cortical pyramidal cells

Pyramidal neurons are the primary excitation units of the mammalian prefrontal cortex.

One of the main structural features of the pyramidal neuron is the triangular soma, or cell body.

synaptic connections

Synaptic communication is distinct from ephaptic coupling.

Learning and memory are expressed as changes in the synaptic connections between neurons.

sensory

Sensory system is part of the nervous system of organisms.

Sensory perception is the process of acquiring and interpreting sensory information

brain stem

In vertebrate anatomy the *brainstem* (or *brain stem*) is the posterior part of the brain.

The brain stem plays an important role in the regulation of cardiac and respiratory function.

neocortex

The *neocortex*, also called the *neopallium* and *isocortex*, is made up of six layers.

The neocortex in primates and other larger mammals has deep grooves and wrinkles.

cerebellum

The cerebellum (*little brain*) is a region of the brain that plays an important role in motor control.

The surface of the cerebellum is covered with finely spaced parallel grooves.

cerebrospinal fluid

The brain "floats" in the Cerebrospinal fluid (CSF), *Liquor cerebrospinalis*.

The cerebrospinal fluid acts as a "cushion" or buffer for the cortex.

schizophrenia

Schizophrenia is a mental disorder characterized by a disintegration of thought processes.

Schizophrenia commonly manifests itself as auditory hallucinations and paranoid delusions.

depression

Depression is a state of low mood and aversion to activity.

Depression (in physiology) is a reduction in a biological variable or the function of an organ.

- **Can you tell the difference between *conscious, consciousness, conscientious conscience?* Give some examples using: *cranium, convoluted, nervous system, mammals, primates, neural tissue, estimates, stroke, neurotoxins, susceptible, convoluted, dysfunctions.***

12 Children can't help getting distracted

As any parent knows, getting your child to concentrate on just one thing at once can be impossible. But if you thought that was because they were simply being naughty, you may be wrong. The way young children's brains work means it is impossible for them to ignore other things that come along and attract their attention, scientists have found. It is only as they get older that their brains are able to tell some parts to switch off so they can concentrate on one thing. The discovery was made by a team at the University of Oregon who noticed that during tests, children who were asked to look at one object often rapidly glanced towards other things in their field of vision.

The researchers took 41 people aged from four to 29 and divided them into age groups. Each were given an object to look at and then another item was placed in their peripheral vision. (Peripheral vision is a part of vision that occurs outside the very center of gaze. There is a broad set of non-central points in the field of view that is included in the notion of peripheral vision. "Far peripheral" vision exists at the edges of the field of view, "mid-peripheral" vision exists in the middle of the field of view, and "near-peripheral", sometimes referred to as "para-central" vision, exists adjacent to the center of gaze.) Children aged four to six had enormous difficulty stopping themselves looking at the other object – they looked many more times and much sooner than any adults. Research leader Dr Paul van Donkelaar said that the problem was much more muted in the seven to nine-year-olds. He believes young children cannot help but be distracted because of the way different parts of the brain interact with each other.

One part, the frontal cortex, controls impulses, movement and social behaviour. However, the brain stem controls the basic activity of the body such as eye movement and the function of other major organs. Dr van Donkelaar thinks that in young children their frontal cortex is not sufficiently developed to be able to stop other parts of the brain reacting to a distraction. He presented the findings on August 15, 2006, to the Brain and Mind Research Symposium of the Association of Pacific Rim Universities in Australia. His team hopes their discovery could also shed light on cerebral palsy. The researchers believe development of the frontal cortex may be delayed well beyond childhood in those with the condition. This may help explain why they have problems picking up objects and controlling their movements.

concentrate

Concentration is “the ability to direct one’s thinking in whatever direction one would intend”. We all have the ability to concentrate some of the time.

ignore

Ignoring people who have always been assisting you through life is only going to harm yourself. There are several ways to ignore a person who is constantly harassing you on Facebook.

switch off

A simple *switch* mechanism has two positions: open (*off*) and closed (*on*).

Switch off the lights when you don’t need them!

discovery

discovery can relate to a thing found out, or for the first time ascertained or recognized.

Discovery News digs deep into our world's mysteries.

rapidly

rapidly refers to moving, acting, or occurring with great speed.

Rapidly developing Alzheimer's may suggest another condition or problem.

glance

glance means to direct the gaze briefly, to move the eyes rapidly from one thing to another.

glance can also refer to sudden quick movements, the way dragonflies *glance* over the *water*.

field of vision

field of vision/view is the area or solid angle which can be viewed through an optical instrument.

field of vision is the area in which objects are visible at the same time when the eye is fixed.

item

item is a single article or unit in a collection, enumeration, or series.

The Item is an American independent, morning newspaper published in Sumter, South Carolina.

peripheral vision

Peripheral vision is a part of vision that occurs outside the very center of gaze.

Peripheral vision loss can be caused by glaucoma or other damage to the optic nerve.

gaze

gaze means to stare intently or earnestly, to look steadily, and with fixed attention.

adjacent

In geometry, *adjacent* angles are often shortened as *adj. ∠s*.

I wish to get to know the whole city and its *adjacent* suburbs.

symposium

In ancient Greece, the *symposium* (*symposion*) was a *drinking party*.

symposium (pl. *-siums*, or *-sia*) refers to a meeting or conference for discussion of a topic.

palsy

palsy is the paralysis of a body part, often accompanied by loss of sensation and by shaking.

Bell's *palsy* is a form of facial paralysis resulting from a dysfunction of the facial nerve.

picking up

Pickup/pick-up truck is a light truck with an open-top rear cargo area.

Unfortunately, her child *picked up* a virus at school.

- **Make sentences of your own, using the words and expressions:** *distract, distracted, distraction, distractor, naughty, adults, major, peripheral, shed, shed light.*

13 Cleaning the blood and removing waste products

Osmosis is the process whereby molecules of solvent (usually water) move through a semi-permeable membrane to the more concentrated solution. This is due to the size of the molecules compared to the holes in the membrane. The holes permit the small water molecules through but not the larger solvent molecules so there is a tendency for the molecular concentrations to approach equality. Osmoregulation describes any process or mechanism in animals that regulates the concentration of salts (e.g. sodium chloride) and water in the body. There is always a tendency for water to pass into or out of an animal's body by osmosis. Water tends to pass into the body of an animal which inhabits fresh water as the concentration of salts within its body is higher than that outside. Animals have a variety of structures to rid the body of excess water. In simple organisms an organelle called a *contractile vacuole* fills with water and expels it to the outside through a pore in the cell membrane. In marine animals there is a tendency to lose water from the body to the surrounding environment where the concentration of salts is higher. In vertebrate animals, the kidneys are the main osmoregulatory organs. In land-dwelling animals, the outer covering of skin or cuticle forms a barrier to excess water gain or loss but other mechanisms are also at work, including kidneys, sweating, panting, behavioural responses.

In humans, there is a pair of kidneys situated at the back of the abdomen and these are responsible for cleaning the blood and removing waste products which are then excreted. The kidney contains numerous tubules called nephrons, each with an expanded cup-shaped portion at one end called the Bowman's capsule. Behind this there is a folded length of tubule, known as the proximal convoluted tubule then a straight hairpin-shaped loop, the loop of Henle, and finally another looped portion called the distal convoluted tubule. Blood enters the Bowman's capsules from tiny capillaries which form a knot, called the glomerulus, inside the cup. This blood is brought to the kidney by the renal artery. Water and waste substances pass along the length of the nephrons and this is known as filtrate. Useful substances, including water and salts are reabsorbed. Many capillaries surround the nephrons and cleaned or filtered blood eventually leaves the kidney in the renal vein. The distal convoluted tubules, containing the waste products which have not been reabsorbed, empty into a collecting duct and final processing takes place. The liquid which is left, known as urine enters the ureter which is a narrow tube leading to the bladder.

osmosis

Osmosis is the diffusion of water down its concentration gradient.

Osmosis is of great importance in biological processes where the solvent is water.

osmoregulation

Osmoregulation is a mechanism for maintaining internal homeostasis.

Osmoregulation relates to the control of the levels of water and mineral salts in the blood.

permeable

Permeation is the penetration of a permeate (such as a liquid, gas, or vapor) through a solid.

Rainwater sinks through *permeable* rock to form an underground reservoir.

sodium chloride

Sodium chloride is also known as *salt*, *common salt*, *table salt* or *halite*.

The *sodium chloride* molecule is the classic case of ionic bonding.

organelle

In cell biology, an *organelle* is a specialized subunit within a cell that has a specific function.

Mitochondria are the cell *organelles* with two layers of membranes.

vertebrate

Vertebrates are chordates with backbones and spinal columns.

Vertebrates are the most advanced organisms on Earth.

panting

panting means breathing rapidly in short gasps, giving off loud puffs, especially while moving.

Dogs tend to *pant* a great deal, because they do not sweat the way humans do.

tubules

A *tubule* is a very small tube or fistular structure.

Renal *tubules* are differentiated into several segments.

nephrons

nephron (Gr. *nephros* meaning *kidney*) is the basic structural and functional unit of the kidney.

About a million *nephrons* in each kidney make the actual changes to the blood composition.

convoluted

A *convoluted* seashell is an example of numerous overlapping coils or folds.

Legal language is convoluted, in other words: intricate, complicated.

distal

distal means opposite to *proximal*, as in the *distal* end of a bone or muscle.

distal is something that is remote from the point of attachment or origin.

glomerulus

glomerulus is a capillary tuft that is involved in the first step of filtering blood to form urine.

The walls of a *glomerulus* are only a few cells in thickness.

renal artery

renal arteries arise off the side of the abdominal aorta, below the superior mesenteric artery.

Renal artery stenosis is the narrowing of the *renal artery*, most often caused by atherosclerosis.

ureter

ureters are muscular tubes that propel urine from the kidneys to the urinary bladder.

ureteral stricture is characterized by a narrowing of the *ureteral* lumen, causing obstruction.

- **Can you make sentences illustrating the meanings of:** *waste, solvent, solution, rid, expels, pore, marine animals, loop, knot, urine?*

14 Closely aligned with WHO

The United Nations Children's Fund (UNICEF) procurement services provide a broad approach to supply management, building on national capacities. The approach includes technical assistance, management services and supply services. The central objective of this service is to assist development partners in the procurement of quality, affordable vaccines from reliable manufacturers. This model relies on financing strategies for developing countries to be developed and implemented by countries and their donor partners, including UNICEF, which provides critical procurement services for low-income countries, focusing primarily on Africa and Asia, while PAHO's RF covers Latin America and the Caribbean. As the two United Nations procurement agencies for vaccines, UNICEF and PAHO (Pan American Health Organization) share similar interests and challenges with their respective supply chains. In 2006, for instance, UNICEF procured vaccines for 40% of the world's children.

UNICEF is closely aligned with WHO and its global initiatives, such as polio eradication, and in the joint development of policy, e.g. for the quality and safety of syringes. UNICEF's Supply Division provides procurement services for governments, non-governmental organizations (NGOs), United Nations Agencies, international financial institutions, philanthropic organizations and universities. Services are not provided to individuals or profit-making entities. Working together with governmental development agencies including the Japanese International Cooperation Agency and the Canadian International Development Agency, the World Bank, WHO, other United Nations agencies, Global Alliance for Vaccines and Immunisation (GAVI) and various foundations and NGOs, UNICEF ensures that vaccines are financed adequately in the countries receiving them.

UNICEF's Supply Division, which oversees the procurement of vaccines, faces many future challenges, including: growing divergence of vaccines used in industrialized and developing countries, with UNICEF as one of several partners working to secure the financing of vaccines for children; the unpredictability of external funding – vaccine supply chain to the world's poorest countries is the most challenging to maintain; the need to guarantee vaccine safety, which encompasses the safety of the vaccine itself, as well as safe injection practices. To that end, UNICEF has been promoting auto-disable syringes and pre-filled auto-disable injection devices.

aligned

He *aligned* himself with the protesters.

Data structure *alignment* is the way data is arranged and accessed in computer memory.

procurement

Procurement is the acquisition of goods and/or services.

Procurement generally involves making buying decisions under conditions of scarcity.

affordable

affordable is something relatively low in price or charging low prices.

Once electronic devices became *affordable*, sales skyrocketed.

vaccines

A *vaccine* is a biological preparation that improves immunity to a particular disease.

A *vaccine* typically contains an agent that resembles a disease-causing microorganism.

polio

Poliomyelitis, often called *polio* or infantile paralysis, is an acute viral infectious disease.

Approximately 90% of *polio* infections cause no symptoms at all.

Polio was eliminated from the Western hemisphere in the second half of the 20th century.

eradication

eradication may also refer to *genocide*.

17 October is the International Day for the *Eradication* of Poverty.

syringes

A *syringe* is a simple pump consisting of a plunger that fits tightly in a tube.

The open end of the *syringe* may be fitted with a hypodermic needle, a nozzle, or tubing.

philanthropic

Philanthropy etymologically means *the love of humanity*.

Rockefeller *Philanthropy* Advisors is the world's largest *philanthropic* service organization.

immunization

Immunisation/immunization can protect people against harmful infections.

Immunisation is a weapon for protecting individuals and the community from serious diseases.

Immunisation uses the body's immune response to build resistance to specific infections.

oversee

This expert was hired to *oversee* design and construction of the new facility.

Gamekeepers *oversee* a hunting ground to see to the wildlife's welfare and look for poachers.

The obsolete meaning of *oversee* is to fail to see; to overlook, to ignore.

challenges

A *challenge* is a general term referring to things imbued with a sense of difficulty and victory.

On January 28, 1986, the Space Shuttle *Challenger* broke apart 73 seconds into its flight.

divergence

Divergence occurs when two lines on a chart move in opposite directions vertically.

The *divergence* theorem is an important mathematical tool in electricity and magnetism.

encompass

encompass means to form a circle or ring around; to surround.

They conducted a survey that *encompassed* a wide range of participants.

- **What do the abbreviations WHO, UNICEF, PAHO, NGO, GAVI stand for? Can you explain the meanings of: supply, reliable, donor partners, global initiatives, unpredictability, external, injection?**

15 Communicating with one another across a gap...

Nervous system is a network of specialised cells and tissues which is present in all multicellular animals to a greater or lesser degree (with the exception of sponges). The activity of the nervous system consists of electrical impulses which are caused by the movement of chemical (sodium and potassium) ions. The nervous system includes receptors, which receive information from the surrounding environment and are called sensory. These are concerned with the senses such as sight, sound, touch and pressure and they transmit the information which they detect along nerves (called sensory nerves) and these travel to the central nervous system. In the simpler animals such as invertebrates, this often consists of a paired nerve cord with swellings along its length called ganglia (sing. ganglion). In vertebrate animals, the central nervous system is highly complex and consists of the brain and spinal cord. Within the central nervous system all the information is decoded and, if appropriate, a response is initiated. This often consists of a signal being sent outwards along a nerve (called a motor nerve) which travels to a muscle causing a contraction to occur. In vertebrates, a part of the nervous system is concerned with the control of the involuntary or smooth muscle of the body. This is called the autonomic nervous system and consists of two divisions, the sympathetic and parasympathetic, which act in opposite ways (antagonistic). It is sometimes called involuntary because its activity regulates the internal environment of the body and it supplies the smooth muscle (heart, gut, etc.) and glands with their motor nerve supply.

A nerve is made up of numerous nerve cells or neurons. Some nerves are sensory, others are motor and yet others are mixed carrying both types of neurons. Each neuron has a cell body (containing the nucleus) and many fine projections called dendrites. Dendrites from surrounding neurons are able to communicate with one another across a gap called a synapse. A long, fine projection runs out from the neuron cell body and this is called an axon. It may be surrounded by a fatty sheath (called a myelin sheath) which is restricted at intervals at sites which are known as nodes of Ranvier. These nodes, regularly spaced constrictions of the myelin sheath occurring at varying intervals along the length of a nerve fiber, were discovered in 1878 by Louis-Antoine Ranvier (1835-1922), a French physician, pathologist, anatomist and histologist.

sodium

Sodium is a chemical element with the symbol Na and atomic number 11.

Sodium occurs naturally in most foods.

potassium

The symbol of *potassium* is K (Neo-Latin *kaliium*), its atomic number 19.

Potassium is a very important mineral for the proper function of all cells, tissues, and organs.

ions

Ions are atoms with either extra electrons or missing electrons.

Molecules that consist of charged *ions* with opposite charges are called *ionic*.

invertebrates

An *invertebrate* is an animal without a backbone.

Invertebrates are the most abundant creatures on earth.

cord

Cord (sewing) is a trimming made of multiple strands of yarn twisted together.

The human *spinal cord* is protected by the bony spinal column.

spinal cord

The *spinal cord* is a long, thin, tubular bundle of nervous tissue and support cells.

The *spinal cord* does not extend the entire length of the vertebral column.

ganglia (sing. **ganglion**)

A *ganglion* is a biological tissue mass, most commonly a mass of nerve cell bodies.

The basal *ganglia* and cerebellum are large collections of nuclei.

projections

A *projection* is a natural outgrowth on an organ or body part.

Projections from the *raphe nuclei* terminate in the dorsal horn of spinal gray matter.

dendrites

Dendrites are the branched projections of a neuron, conducting the electrochemical stimulation.

A crystal *dendrite* is a crystal that develops with a typical multi-branching tree-like form.

synapse

synapse permits a neuron to pass an electrical or chemical signal to another cell.

Information from one neuron flows to another neuron across a *synapse*.

sheath

In fashion, a *sheath* dress is a type of dress designed to tightly fit the body.

sheath may refer to: scabbard, a *sheath* for holding a sword, knife, or other large blade.

sheath is an investing cover or case of a plant or animal body or body part.

myelin

Myelin forms a layer, the **myelin** sheath, usually around only the axon of a neuron.

Myelin damaged, the process involves numerous health conditions, including multiple sclerosis.

pathologist

Pathology is the precise study and diagnosis of disease.

Pathologists are doctors who study the cause and development of disease.

histologist

histology is the anatomical study of the microscopic structure of animal and plant tissues.

histologist is a medical scientist who specializes in the study of the structure of organ tissues.

- **Give some examples using:** *sponges, environment, sensory, detect, occur, division, antagonistic, nucleus, gap, nodes, anatomist.*

16 A cure for losing one's voice?

A new type of gel has been created by scientists to tackle damaged voice boxes – prompted by the singer Julie Andrews. The team behind the research say the gel – which is injected into the vocal cords – could revolutionise the treatment of voice complaints. Voice disorders in many of the cases are the result of scarring of the vocal cords. Causes can include overuse, common in teachers, or surgery to remove cancerous or benign growths. Scarring can also result from damage to the larynx from disease or accident and when a breathing tube is placed down the throat during prolonged surgery or in multiple operations. As a result of the scarring, the patient suffers from loss of voice strength or, in extreme cases, can completely lose their voice. The new gel has been developed by Steven Zeitels, professor of laryngeal surgery at Harvard Medical School. When Julie Andrews lost her voice 13 years ago, after throat surgery to remove non-cancerous growths, she was left with scarring on her vocal cords, so sought Professor Zeitels's help. Although he could do nothing at that time, he had started early-stage research on injectable treatments for vocal cord scarring and his contact with the singer inspired him to follow this avenue of research.

The vocal cords, also known as vocal folds, vibrate as air passes between them – which is what produces the sound during speaking or singing. The cords have a soft outer cover and damage or overuse leads to stiff scar tissue replacing this normal soft tissue, reducing their ability to vibrate. Symptoms of the scarring include hoarseness or a rough, scratchy voice, as well as difficulty in hitting the high notes during singing. The idea is that the gel, which would be injected twice a year, softens the vocal cords and restores movement after they have become stiffened with scarring. The new treatment does not focus on the scar tissue as a problem, as many surgical treatments do, but is aimed at improving the flexibility of the remaining healthy tissue. The gel, called polyethylene glycol, is widely used in many medical products, such as skin creams, pill coatings and lubricants, where it makes the texture more fluid. By altering the molecules of the material, the researchers changed its elasticity to match that of the human vocal cords. They made the material firmer, but still liquid enough to be injected and finally developed a gel with the right elasticity.

cure

The cats proved to be a good cure for our mouse problem.

The treatment cured the boy's acne.

voice boxes

voice box is a cartilaginous structure at the top of the trachea, which contains elastic vocal cords.

In anatomy, this organ of speech is also called the larynx.

vocal cords, vocal folds

Sound is generated through the rhythmic opening and closing of the vocal folds.

vocal cords are stretched horizontally across the larynx.

complaint

complaint is the main symptom or reason for which the patient seeks treatment.

complaint is in fact any expression of pain, dissatisfaction, or resentment.

cancerous

A cell becomes cancerous because of damage to its DNA.

The patient was told a lump in her foot was cancerous and that her leg was to be removed.

benign

A tumour is benign when it is not dangerous to health, not recurrent or progressive.

The company operated under relatively benign economic conditions.

growths

growth of an organism is usually a result of an increase in the number of cells.

teratology (in biology) is the study of malformations or abnormal growth in animals or vegetables.

larynx

larynx has walls of cartilage and muscle and contains the vocal cords.

The great difference between man and monkey is in the *larynx*.

tissue

Epithelial cells line the surfaces and cavities of tissues and organs throughout the body.

There are four basic types of tissue: muscle, nerve, epidermal, and connective.

polyethylene

Polyethylene contains the chemical elements carbon and hydrogen.

Polyethylenes are easily molded and are resistant to other chemicals.

glycol

In organic chemistry, *glycol* is any aliphatic diol.

The name of polyethylene glycol is usually shortened to PEG.

lubricant

lubricants are substances used to reduce friction between objects or surfaces.

Lubricants such as 2-cycle oil are added to fuels like gasoline which has low lubricity.

texture

That piece of music had a mainly smooth texture.

The beans had a grainy, gritty texture in her mouth.

elasticity

Elasticity is the property by which a material can regain its original dimensions.

Elasticity also refers to quality of being adaptable, or to readiness for change.

- **Now you try to make some sentences using:** *gel, scar, surgery, tube, injectable, avenue, vibrate, scratch, scratchy, stiff, stiffen, flexible, flexibility, coating, fluid, elastic, elasticity.*

17 Diabetics are usually told to eat plenty of carbs...

There is no doubt carbohydrate is an important fuel for the body. It is a good source of energy because it is easily converted into glucose. However, eating too much carbohydrate means there is a constant demand for insulin. Cells in the body can then become insulin-resistant, causing a vicious cycle of events – the body keeps producing higher and higher levels of insulin to deal with the insulin resistance, which in turn makes the cells more resistant and blood sugar levels remain high. Excess sugars become stored as fat, causing weight gain, and this together with high blood sugar levels can lead to the development of Type 2 diabetes. The new guidelines about Type 2 diabetes are a result of a review of medical evidence.

‘The long-standing view that a high-carbohydrate diet is best for people with diabetes is probably not true,’ says Dr Tony Leeds, an obesity specialist at the Whittington Hospital, London. ‘It could mean your blood sugar levels are not as well controlled as they should be and this can lead to worsening symptoms. The evidence now suggests we should be using a slightly higher-protein, lower-carbohydrate diet – not just for people with diabetes, but perhaps for everyone because it lowers blood glucose levels and therefore the need for insulin.’

Earlier in 2011, this sea change was given official backing for the first time by the leading charity Diabetes UK, following a growing body of research which suggests that a low-carb diet is good for Type 2 diabetics. One study published in 2004 in the journal *Diabetes* found that men with Type 2 diabetes had lower blood glucose levels after five weeks on a lower-carb diet (20 per cent of calories from carbs) than if they were eating a higher-carb diet (55 per cent of calories from carbs). Another study published the same year in *Annals of Internal Medicine* found that eating fewer than 30 grams of carbs a day for a year improved blood sugar levels, lowered fats in the blood called triglycerides, and raised good cholesterol more than a conventional diet.

The American Diabetic Association changed its advice on low-carb diets in 2008 and now considers them an effective treatment for short-term weight loss among obese people suffering from Type 2 diabetes. The UK authorities have followed suit and the new advice from Diabetes UK for people with Type 2 diabetes – quietly issued in March, 2011 – is that a diet where less than 45 per cent of calories come from carbohydrates may be suitable for a year.

diabetes

Diabetes mellitus is a chronic condition characterized by high levels of glucose in the blood. Eye problems are often caused by high blood sugar levels over an extended period of time.

diabetics

Air pollution increases risk of heart disease in diabetics.

Diabetic neuropathy is a family of nerve disorders caused by diabetes.

carbs, carbohydrates

The most nutritious snacks contain complex carbohydrates.

Fiber is a nondigestible carbohydrate, known to have beneficial physiological effects in humans.

glucose

Oral glucose tolerance test is a test to determine the body's ability to handle glucose.

People with Impaired Glucose Tolerance (IGT) have blood glucose levels higher than normal.

insulin

Insulin was the first hormone to be synthesized completely in the laboratory.

Regular insulin acts within 30 minutes, and its effects last 6 to 8 hours.

vicious

Vicious people are those who are addicted to vice, grossly immoral, wicked and often cruel.

He complains of a vicious circle where the more he gives, the more they expect from him.

sugars

Glucose is a carbohydrate, and is the most important simple sugar in human metabolism.

Naturally occurring sugars are found naturally in foods such as fruit (fructose) and milk (lactose).

fat

Chemically, fats are triglycerides, triesters of glycerol and any of several fatty acids.

Lard, fish oil, butter/ghee and whale blubber are examples of edible animal fats.

obesity

Obesity increases the risk of developing a large number of diseases.

Fast food consumption and lack of exercise are just a couple of causes of childhood obesity.

protein

Proteins provide both calories and the necessary amino acid building blocks.

Casein and whey are the two major proteins of human milk and most milk-based formulas

charity

Generally speaking, charity is the practice of benevolent giving and caring.

Drug companies donate millions of dollars to charities and often provide free drugs.

triglycerides

A triglyceride is an ester derived from glycerol and three fatty acids.

In humans, triglycerides are a mechanism for storing unused calories.

cholesterol

Cholesterol is a waxy steroid of fat that is produced in the liver or intestines.

Cholesterol exists in the outer layer of every cell in human body and has many functions.

annals

annals is the word derived from the Latin *annālis*, yearly, from *annus*, a year.

Annals are a concise form of historical representation which record events chronologically.

- **Can you now make sentences with:** *fuel, convert, resistant, cells, cycle, evidence, backing, calories, short-term, weight?*

18 The different types of H and N...

People often speak loosely when they use the word *flu* perhaps because we do not realise how serious it really is. In fact “ordinary” seasonal flu claims up to half a million lives a year, many in the tropics where it generally goes undiagnosed.

Modern flu research began seriously in 1933, when scientists first isolated the human influenza virus. A virus is a microscopic particle that works a bit like a parasite (though, unlike parasites, a virus is not, strictly speaking, “alive”) because they cannot reproduce unless they attach themselves to the cell of some organism. When they do so, they infect that organism, whether it be plant, animal or human.

In the 1940s, the US researcher George Hirst found that it was an enzyme on the virus that did the damage to the host human organism by destroying receptors on red blood cells. In 1948, drawing on this work in seeking some sort of prevention or cure, MacFarlane Burnet from the Walter and Eliza Hall Institute in Melbourne inspired future medical scientists when he speculated that a drug representing “an effective competitor poison” for the virus enzyme could prevent infection. Burnet’s protégés found that one spike-like protein on the surface of the virus – haemagglutinin (H) – binds to sialic acid on the surface of a cell, which it then enters and infects. Another protein – neuraminidase (N) – cleaves off the sialic acid, thus allowing the multiplying virus to leave the cell to infect others. The different types of H and N make up all varieties of flu virus.

In the early 1970s Australian scientist Graeme Laver, researching the connection between pandemic flu and birds, collected and analysed samples from nesting sites on the Great Barrier Reef. He found that neuraminidase could be spun using a centrifuge into a crystalline form, rather than the usual amorphous form. That allowed Peter Colman, another Australian researcher, to analyse their structure using X-ray crystallography. “I provided the protein, and he solved the structure,” recalls Laver. “Nowadays you could use a computer, but then it was done more or less manually, very tediously drawing contour maps on big stacks of plastic.” Colman found that each neuraminidase spike had four identical square balloons on its head, each with a deep cleft. Here was a possible solution: a “plug drug” to fill the cleft could in theory block the function of the protein to remove sialic acid, keeping the virus glued to an infected cell and unable to spread.

claim

She *claimed* that he was telling the truth.

After half an hour's wait, she finally *claimed* her luggage at the airport carousel.

tropics

The *tropics* is a region of the Earth surrounding the Equator.

The *tropics* are also referred to as the *tropical zone* and the *torrid zone*.

attach

Please do not *attach* your photographs to your applications with a staple!

Attach! is a simple tool that scans the user's outgoing email for mention of *attachments*.

infect

To *infect* is to contaminate sbd. or sth. with a disease or with some other negative element.

Infecting parasites seek to use the host's resources to reproduce, often resulting in disease.

inspire

The salesman was obviously *inspired* by the prospect of a bonus.

The falling leaves *inspired* her with sadness.

speculate

Now we can only *speculate* on the reasons for such a change.

One is only advised to *speculate* with the money he can afford to lose.

protégés

Protégé is a one whose career is furthered by a person of prominence, or influence.

The person in receipt of mentorship may be referred to as a *protégé* (m.)/a *protégée* (f.).

spike

A *spike* is a nail-like fastener, longer and proportionately thicker than a common nail.

Spikes are used for fastening together heavy timbers or railroad track.

sialic acid

Sialic acid storage disease is an inherited disorder that primarily affects the nervous system.

Infantile free *sialic acid* storage disease (ISSD) is the most severe form of this disorder.

cleaves off

Some synonyms of *cleave* are: bifurcate, branch off, cross, cut across, fork, halve, divaricate.

Hepatitis C virus protease NS3/4A *cleaves* antiviral signaling protein *off* the mitochondria.

spun

A *spin-out* refers to a type of corporate action where a company "splits off" sections of itself.

Extremely complex shapes can be *spun* over ice forms, which then melt away after spinning.

tediously

tedious is something that is tiresome by reason of length, slowness, or dullness; sth. boring.

Alternative words for *tediously* could be *dully*, *monotonously*, *tiresomely*, *insipidly*, *dryly*.

stacks

stack can refer to a pile or mound of something.

Stack interchange is a free-flowing grade separated junction between two roads.

cleft

cleft is a space or opening made by or as if by splitting, a *fissure*.

Orfacial clefts are birth defects in which there is an opening in the lip and/or palate.

- **Now give your own examples with:** *loose, loosely, diagnosis, diagnosed, undiagnosed, influenza, centrifuge, crystal, crystalline form, amorphous, crystallography, manually, contour, plug, glued.*

19 A disease more severe than the common cold

Influenza, commonly referred to as the flu, is an infectious disease caused by RNA viruses of the family Orthomyxoviridae (the influenza viruses), that affects birds and mammals. The most common symptoms of the disease are chills, fever, sore throat, muscle pains, severe headache, coughing, weakness/fatigue and general discomfort. Although it is often confused with other influenza-like illnesses, especially the common cold, influenza is a more severe disease than the common cold and is caused by a different type of virus. Influenza may produce nausea and vomiting, particularly in children, but these symptoms are more common in the unrelated gastroenteritis, which is sometimes, inaccurately, referred to as “stomach flu.” Flu can occasionally cause either direct viral pneumonia or secondary bacterial pneumonia.

Typically, influenza is transmitted through the air by coughs or sneezes, creating aerosols containing the virus. Influenza can also be transmitted by direct contact with bird droppings or nasal secretions, or through contact with contaminated surfaces. Airborne aerosols have been thought to cause most infections, although which means of transmission is most important is not absolutely clear. Influenza viruses can be inactivated by sunlight, disinfectants and detergents. As the virus can be inactivated by soap, frequent hand washing reduces the risk of infection.

Influenza spreads around the world in seasonal epidemics, resulting in the deaths of between 250,000 and 500,000 people every year, up to millions in some pandemic years. Three influenza pandemics occurred in the 20th century and killed tens of millions of people, with each of these pandemics being caused by the appearance of a new strain of the virus in humans. Often, these new strains appear when an existing flu virus spreads to humans from other animal species, or when an existing human strain picks up new genes from a virus that usually infects birds or pigs. Vaccinations against influenza are usually made available to people in developed countries. Farmed poultry is often vaccinated to avoid decimation of the flocks. The most common human vaccine is the trivalent influenza vaccine (TIV) that contains purified and inactivated antigens against three viral strains. Typically, this vaccine includes material from two influenza A virus subtypes and one influenza B virus strain. The TIV carries no risk of transmitting the disease, and it has very low reactivity. A vaccine formulated for one year may be ineffective in the following year, since the influenza virus evolves rapidly, and new strains quickly replace the older ones.

influenza

Influenza is a viral infection that affects the nose, throat, bronchi and, occasionally, lungs. *Influenza A* usually arrives between early winter and early spring.

flu

Flu symptoms in birds are variable and can be unspecific.

The flu is a virus that can make you sick for a week or longer.

chills

chills refers to feeling cold after an exposure to a cold environment.

Chilling is the sensation of coldness, often accompanied by shivering and pallor of the skin.

discomfort

discomforting is something that disturbs one's comfort, an annoyance.

Some audience members *were discomforted* by the graphic violence.

nausea

nausea is the sensation of discomfort in the upper stomach and head with an urge to vomit.

There are many causes of *nausea*, including food poisoning, viruses, vertigo, head injuries,...

vomiting

Most *vomiting* is caused by gastroenteritis, and usually is not serious.

Nausea and *vomiting* are not diseases, but rather are symptoms of many different conditions.

gastroenteritis

Gastroenteritis is also known as gastric flu, stomach flu, and stomach virus.

Gastroenteritis is a nonspecific term for various pathologic states of the gastrointestinal tract.

pneumonia

Pneumonia is a lung infection that can make a person very sick.

Pneumonia can be caused by different types of germs, most commonly viruses.

aerosols

Technically, an *aerosol* is a suspension of fine solid particles or liquid droplets in a gas.

Aerosols interact both directly and indirectly with the Earth's radiation.

secretions

Secretion is the process of elaborating, releasing, and oozing chemicals.

Glandular *secretions* secrete water and electrolytes to go along with the organic substances.

airborne

Her child had an allergic reaction to airborne pollen.

Once the plane was airborne, drinks were brought round.

epidemics

epidemic is an outbreak of a disease spreading rapidly in an area or population.

epidemic is a rapid development, spread, or growth of something, esp. something unpleasant.

pandemic

pandemic is an epidemic over a very wide area, affecting a large proportion of the population.

H1N1, "swine flu", first appeared in April 2009 and quickly went on to become a pandemic.

decimation

Decimation was a form of military discipline used by officers in the Roman Army.

Probiotics counter the decimation of helpful intestinal bacteria by antibiotics.

viral

Hepatitis is most often viral, due to infection with one of the hepatitis viruses.

Viral encephalitis is an inflammation of the brain as a result of virus infection.

- **You could make some additional examples, using:** *fever, sore, sore throat, headache, coughing, contaminated, inactivated, sneezes, detergents, disinfectants, vaccinations, trivalent, evolves.*

20 Does Mother Nature know best?

Cloning – using genetic engineering to make exact copies of living plants and animals – has been in science fiction for years. It has become part of real life and the subject of public debate with the cloning of a sheep, Dolly, in 1997. In February, that year, scientists in Scotland claimed they successfully produced a ewe (the female of the sheep, especially when mature), which they called Dolly, that had been cloned from another adult ewe. However, it was later conceded that there was a very remote possibility that Dolly might have been cloned from foetal cells that were circulating in the ewe's bloodstream.

For some people, human cloning is acceptable in medicine despite the criticism that it is unnatural. For example, human tissue can be cloned for use in organ replacement or gene therapy. Also, organs could be provided by human clones. When a child is suffering from a fatal disease and needs an organ donor, its parents could have a younger cloned brother or sister – effectively an identical twin. This would provide 100% donor compatibility whereas an organ donated from another brother or sister would only stand a 25% chance of being successful. Moreover, couples who cannot have children may wish to clone a child from themselves. Finally, endangered animals could be cloned to increase their numbers.

On the other hand, there are many arguments against cloning. Although many people saw the cloning of Dolly as a major breakthrough, it is just another step towards 'playing with nature'. Firstly, in spite of what they say, scientists have no idea of the long-term effects of genetic engineering. More and more genetically altered plants are being produced, and cloned farm animals are next. However, creating 'perfect' plants and animals could eliminate the great variety of species on our planet. Furthermore, some scientists say we could transplant organs from cloned animals into humans, even though the risks to health are enormous and many people find the idea repulsive.

All things considered, many well-known social activists and scientific personalities are against cloning. It is clear that we need to regulate genetic engineering and stop experiments now, before it is too late!

cloning

cloning relates to processes used to produce genetically identical copies of a biological entity. Scientists have successfully *cloned* several animals.

Dolly, the first mammal *cloned* from an adult body cell, has caused panic and controversy.

genetic engineering

Genetic engineering is also often called *genetic modification*.

GE is the direct human manipulation of an organism's genome using modern DNA technology.

Genetic engineering is going to become a very mainstream part of our lives sooner or later.

ewe

Ewe is the female of the sheep esp. when mature; also the female of various related animals.

The *Ewe* are a people located in the southeast corner of Ghana, east of the Volta River.

foetal

'Optimal *Foetal Positioning*' (OFP) is a theory developed by a midwife, Jean Sutton.

The word *fetus* is also spelled *foetus*, *foetus*, *faetus*, or *fætus*.

donor

A *donor* in general is a person who donates something voluntarily.

Marrow transplants are provided from volunteer unrelated *donors* to patients with leukemia.

Donors and donations usually used to represent a form of pure altruism.

identical twin

Identical twins form when a single fertilised egg (ovum) splits in two.

Identical twins are thought to be exactly alike, but there are many differences.

compatibility

How *compatible* are you with your current partner, lover or friend?

Where can I go to find out if all the medicine I am taking is *compatible* with each other?

breakthrough

breakthrough is an important discovery or event that helps to improve a situation.

Scientists have made a major *breakthrough* in the treatment of cancer.

altered

alter means to *change* or *make different*, to *modify*.

World *Altering Medicine* is a medical non-profit organization run by a small group of doctors.

species

A *species* is one of the basic units of biological classification and a taxonomic rank.

The nature of *species* is controversial in biology and philosophy.

World Wildlife Fund is committed to endangered *species* protection.

transplant

Organ *transplantation* is the moving of an organ from one body to another.

Transplantable organs are the heart, kidneys, eyes, liver, lungs, pancreas, intestine, thymus.

In the USA, tissue transplants are regulated by the U.S. Food and Drug Administration (FDA).

repulsive

repulsive is something causing repugnance or aversion, something disgusting.

repulsive also relates to something tending to *repel* or *drive off*.

A *repulsive appearance* is that of somebody who makes you feel sick or groggy.

- **It should not be difficult now to make some sentences using:** *science, fiction, science fiction, debate, debatable, effect, effective, effectively, chance, couples.*

21 Down the hatch!

From brain tissue to gallstones, doctors have long preserved specimens from their patients – as trophies, as teaching tools, sometimes as curiosities or even art. But Dr. Chevalier Jackson went much further than most. This laryngologist who worked in the late 19th and early 20th centuries, preserved more than 2,000 objects that people had swallowed or inhaled: nails and bolts, miniature binoculars, a radiator key, a child’s perfect-attendance pin, a medallion that says *Carry me for good luck*. He retrieved these objects from people’s upper torsos, generally with little or no anesthesia.

– He was a fetishist, no question – said Mary Cappello, the author of *Swallow* (New Press), a new book about Jackson and his bizarre collection. – But his obsession had the effect of saving lives. That’s kind of amazing, and lucky for us that his madness made possible forms of rescue. – Jackson was an artisan and a mechanical prodigy, a humanist and an ascetic whom colleagues sometimes described as aloof or cold. He spent hundreds of hours crushing peanuts with forceps to learn exactly how much pressure to exert. He experimented extensively on mannequins and dogs. In those days surgery was associated with high mortality, and few physicians were willing or able to peer into the air and food passages, let alone remove objects like open safety pins. Yet the survival rate among patients from whom he removed objects was better than 95 percent.

Jackson viewed the world as a precarious place. Small and bookish as a child, he endured intense torment and bullying; at one point other children blindfolded him and threw him into a coal pit, and he was rescued only after a dog happened to find him unconscious. – So in a sense, Ms. Cappello said – when Jackson became a physician, first in Pittsburgh, then Philadelphia, he was saving lives, yes, but he was also saving himself. – He grew to be a pioneer of the upper body, developing new endoscopic techniques for peering into dark recesses. He attached a tiny light called a mignon lamp to the end of a rod that he inserted into his scopes. (Previously, physicians who used endoscopes had worked mainly with light held outside the body.) And he was an early and outspoken safety advocate, particularly when it came to children. As one of his assistants put it, his quest was to make the public and the medical profession “foreign-body-conscious” about swallowing. If it had been up to him, parents who fed peanuts to children without molars would be drawn and quartered. Chew everything thoroughly, he exhorted the public: “Chew your milk!”

gallstones

gallstone, crystalline concretion, is formed in the gallbladder by accretion of bile components. *Gallstones* are small stones, made from cholesterol, bile pigment and calcium salts.

laryngologist

Laryngology deals with disorders, diseases and injuries of the vocal apparatus, esp. the larynx. A *laryngologist* treats disorders of voice, breathing, and swallowing.

bolts

Dead *bolt*, a kind of locking mechanism.

That company has been a leading supplier of fasteners, *bolts*, nuts, etc.

torso

Trunk or *torso* is an anatomical term for the central part of the many animal bodies.

A *torso* is a statue of the human body with the head and limbs omitted or removed.

fetishist

Essentially, *fetishism* is the ethic attribution of inherent value or powers to an object.

The word *fetish* is derived through the Portuguese *feitico* from the Latin *factitious*.

artisan

An *artisan* is a skilled manual worker who makes items either functional or strictly decorative.

The word *artisan* comes from the Italian word *artigiano*.

prodigy

prodigy can refer to a person with exceptional talents or powers, e.g. a math *prodigy*.

Prodigy is sth. extraordinary, or out of the usual course of nature, from which omens are drawn.

ascetic

Those who practice *ascetic* lifestyles do not consider their practices virtuous in themselves.

One can be an *ascetic* without being a mystic.

forceps

Forceps or *forcipes* are a handheld, hinged instrument used for grasping and holding objects.

Forceps are designed to aid in the delivery of the fetus by applying traction to the fetal head.

mannequins

A *mannequin* is also called a *dummy*, *lay figure* or *dress form*.

A *mannequin* is an often articulated doll used by artists, tailors, dressmakers,...

peer

A *peer* is a person who is equal to another in abilities, qualifications, age, background,...

peer means *to look* intently, searchingly, or with difficulty.

precarious

Precarious work describes employment which is poorly paid, insecure, unprotected,...

precarious footing on the ladder dangerously lacks in security or stability.

molars

Molars are the rearmost and most complicated kind of tooth in most mammals.

There are many good reasons for removing *wisdom teeth*, also known as *third molars*.

exhorted

exhort means to urge, advise, or caution earnestly.

We are all *exhorted* to live according to the law.

- **You are expected now to give your own examples using:** *hatch, swallow, inhale, specimens, retrieve, nails, binoculars, pin, safety pins, medallion, obsession, rod, outspoken, aloof, recesses, foreign body, foreign-body, blindfolded, coal pit, quartered, conscious, consciousness, conscientious, conscience.*

22 Elements of the human muscular system

The study of muscles is called myology. The muscular system is composed of specialized cells called muscle fibers. There are three kinds of muscle tissue: *smooth* – smooth muscles make up the walls of the hollow body organs as well as those of the blood vessels and respiratory passageways. They move involuntarily and produce wavelike motions of peristalsis that move substances through a system; *cardiac* – also involuntary, makes up the wall of the heart and creates the pulsing action of that organ. The cells of cardiac muscle are striated, like those of skeletal muscle. They differ in having one nucleus per cell and branching interconnections; *skeletal* – featuring heavily striated cells. Such cells are very long and cylindrical, and have multiple nuclei. They can contract as a large unit when stimulated.

The predominant characteristic of the muscle fibers is *contractibility*. When stimulated, muscle cells have the ability to shorten or contract. Nearly all movement in the body is the result of muscle contraction. The integrated action of joints, bones, and skeletal muscles produces obvious movements such as walking and running. Skeletal muscles also produce more subtle movements that result in various facial expressions, eye movements, and respiration. In addition to movement, muscle contraction also fulfills some other important functions in the body, such as posture, joint stability, and heat production. The skeletal muscles are continually making fine adjustments that hold the body in stationary positions. The tendons of many muscles extend over joints and in this way contribute to joint stability. Heat production, to maintain body temperature, is an important by-product of muscle metabolism.

All muscles demonstrate *responsiveness*. As muscle cells are stimulated by chemical signals, stretching, electrical charge, or other stimuli, the cells respond through an electrical change across their plasma membrane of the cell. Another common trait of all muscles is *conductivity*. When one muscle cell is stimulated, the electrical charge it generates across its membrane stimulates the muscles on either side of it, causing the charge to travel along the muscle cells and to communicate the response throughout the muscle tissue. The fourth common characteristic of muscle cells is *extendibility*. This is the opposite of contractibility, in that the muscles must extend between contractions. Finally, all muscle cells must have *elasticity*. When muscles are relaxed, they can stretch. When the tension is released, an elastic cell returns to its original length and shape.

peristalsis

Peristalsis is a series of organized muscle contractions in the digestive tract. The process of peristalsis begins in the esophagus when a bolus of food is swallowed.

striated

Striated muscle (anatomy) is the most common of the three types of muscle in the body. Striated muscle is attached to bone and produces all the movements of the body.

interconnections

interconnection refers to a state of being connected reciprocally. Neuroendocrinology investigates interconnections of the endocrine and nervous systems.

subtle

subtle is something so slight as to be difficult to detect or describe, something elusive. Racial discrimination still exists, only now it's *subtler* than it once was.

facial, facial expressions

Trigeminal neuralgia causes facial pain. Ramsay Hunt syndrome is an infection of a facial nerve that causes a red painful rash. Do facial expressions reflect inner feelings, or are they social devices for influencing others?

posture

Posture is the position in which you hold your body upright against gravity while standing. Good posture can help prevent back pain.

tendons

The forces applied to a *tendon* may be more than five times one's body weight. If the tendon has been severely injured, a *tendon graft* may be required.

by-product

by-product is something produced in the making of something else. Animal by-products are products of animal origin not intended for human consumption.

responsiveness

responsiveness refers to the quality or state of being responsive. A *responsive* student is a one readily reacting to suggestions, influences, appeals, or efforts.

charge, electrical charge

electric/electrical charge comes in two types, called *positive* and *negative*. Positively charged objects and negatively charged objects experience an attractive force. Electrically charged matter is influenced by, and produces, electromagnetic fields.

conductivity

Electrical conductivity is a measure of a material's ability to conduct an electric current. Conductivity is a measure of the ability of water to pass an electrical current.

extendibility

The cloud of smoke *extended* from one end of town to the other. *extendible/extendable* is something that is capable of being lengthened.

elasticity

elasticity is the property causing a material to be restored to its original shape after distortion. An object is more elastic if it restores itself more precisely to its original configuration. *Bulk elastic properties* describe the response of the materials to changes in pressure.

- **Try to make your own examples using:** *involuntary, involuntarily, contraction, integrated, stationary, stationery, metabolism, trait.*

23 Enzymes

Enzymes are macromolecular catalysts of biological origin. Since all of the enzymes investigated have been found to be proteins, we can also define enzymes as catalytically active proteins. Like other catalysts enzymes accelerate chemical reactions. The substances which undergo a chemical reaction due to the catalytic action of an enzyme are called its substrates. Many of the catalyzed reactions are reversible; both the forward and the reverse reaction may be catalyzed by the same enzyme. Theoretically, a catalyst is not used up in the catalyzed reaction so that very small amounts of an enzyme suffice for the turnover of large amounts of the substrate. However, being proteins, the enzymes suffer the fate of all proteins, and are slowly metabolized and degraded so that they have to be continually regenerated in the organism.

The function of enzymes is to make metabolic reactions possible at body temperature, i.e. at temperatures varying from 0°C in arctic plants and poikilothermic (cold-blooded) animals to 38°C in the homoeothermic (warm-blooded) animals. The presence of enzymes allows the combustion of organic substances in the living cells, and a variety of other reactions, to take place at these low temperatures, whereas temperatures of several hundred degrees are required for the same reactions *in vitro*. This must not lead to the erroneous view that enzymes affect the energy balance of a reaction. Enzymes do not supply energy. They merely facilitate reactions which will bring the system closer to its equilibrium state.

One of the simplest chemical reactions is the combination of oxygen with hydrogen to form water: $O_2 + 2H_2 \rightarrow 2H_2O$. In this reaction the equilibrium lies so far to the right that the reverse reaction cannot be observed. The reaction, as we know, proceeds with the release of an enormous amount of energy either as heat, or sometimes as explosive force. Nevertheless, it does not take place spontaneously in the absence of catalysts. A mixture of hydrogen and oxygen can be stored indefinitely without any danger of explosion. However, if a trace of activated platinum is introduced into the mixture, it acts as a catalyst and causes immediate explosion and conversion of the gas mixture into water. Many biological oxidations, e.g. the combustion of fats or carbohydrates to carbon dioxide and water, also have equilibria which lie far to the right. For practical purposes, these reactions can be considered as irreversible. The reverse reaction, formation of organic material from carbon dioxide and water, cannot take place unless energy is supplied in a suitable form.

enzymes

Like all catalysts, enzymes work by lowering the *activation energy* (E_a^\ddagger) for a reaction. Enzyme reaction rates are millions of times faster than those of un-catalyzed reactions.

catalysts

A catalyst may participate in multiple chemical transformations.

Catalysts that speed the reaction are called *positive catalysts*.

proteins

Some proteins fold into a highly rigid structure with small fluctuations.

Many proteins are enzymes that catalyze biochemical reactions and are vital to metabolism.

chemical

The substance(s) initially involved in a chemical reaction are called reactants or reagents.

Chemical reactions are used in chemical synthesis in order to obtain a desired product.

degrade

The degradation of chemical compounds is chemical decomposition.

Environmental degradation refers to damage to the ecosystem and loss of biodiversity.

substrates

In biochemistry, a *substrate* is a molecule upon which an enzyme acts.

By increasing the substrate concentration, the rate of reaction will increase.

turnover

Cell turnover refers to the replacement of old cells with newly generated ones.

In elderly women it is important to reduce the turnover of bone.

poikilothermic

The term *poikilothermic* comes from the Greek *poikilo*, varied, and *term*, heat.

A *poikilotherm* is an organism whose internal temperature varies considerably.

homoeothermic

homoeothermic is a term that refers to warm-blooded animals.

Homoeothermic animals can keep their body temperatures constant.

combustion

combustion is the sequence of exothermic chemical reactions between a fuel and an oxidant.

combustion is defined as the burning of a fuel and oxidant to produce heat and/or work.

in vitro

A test that is performed *in vitro* is one that is done in glass or plastic vessels in the laboratory.

in vitro is the opposite of *in vivo*, which means *in a living organism*.

facilitate

facilitator describes someone who assists people with communication disorders.

The moderator's role is to *facilitate* the discussion by asking appropriate questions.

hydrogen

hydrogen is a nonmetallic element that is the simplest and lightest of the elements.

hydrogen, the most plentiful element in the universe, is present in all organic compounds.

oxidation

Calcium protects vitamin A and essential fatty acids from *oxidation* in the body.

Caffeine is related to weight loss, thermogenesis, and fat oxidation.

- **Can you give your own definitions/explanations of:** *reactions, undergo, suffice, spontaneously, organism, balance, oxygen, conversion, regenerate?*

24 Eye implant for macular oedema

Retinal vein occlusion comes with no warning, so it can be very frightening. Many patients wake up with poor vision in one eye or a black spot in the centre of the field of vision. If untreated, it can cause blindness. The condition occurs when a blood clot forms in a retinal vein. These veins are meant to drain blood from the eye after essential nutrients and oxygen from it have been supplied to the retina, the light-sensitive tissue at the back that allows us to see. When a retinal vein is blocked, blood and other fluids leak into the retina, causing swelling and a lack of oxygen. The main cause is atherosclerosis, or hardening of arteries, and is most common in those aged 65 and older, although 10 per cent of cases involve younger people. Retinal vein occlusion can cause a severe visual impairment, known as macular oedema. It is the cause of half of all cases of this impairment, with 25,000 new ones in Britain every year. Macular oedema can also be caused by wet age-related macular degeneration (which affects 50,000 Britons) and diabetes (as high blood-sugar levels damage the blood vessels next to the retina).

The treatment they are trialling now at St. Paul's Eye Unit, Royal Liverpool University Hospital, *Ozurdex*, could help all these patients. In June 2011, it was approved by the National Institute for Health and Clinical Excellence for use on patients with macular oedema caused by retinal vein occlusion, so they are rolling it out nationally. Trials are also underway for its use on other causes of macular oedema, such as diabetes.

The treatment involves injecting a steroid, dexamethasone, into the eye to reduce the inflammation of the retinal vein, so decreasing damage to the retina. Dexamethasone has been used since the 1970s, but until now it only had a short-lived effect as it was naturally pushed out of the eye. Within days it would have worn off, so patients repeat jabs at least every few weeks. In this new trial they implant the steroid in a biodegradable capsule, just 6 mm long. This dissolves over months, slowly releasing the drug. That way, it has a more long-lasting effect and can reverse vision loss for good. The implant dissolves totally after six months.

About 80 per cent of patients have better vision in the treated eye and can see an extra three lines on an eye chart. It is the difference between driving and not driving, reading and not reading. This is a major step forward in treating this condition and could help many thousands.

macula

macula is a small spot; a *macula* on the skin is a small flat spot. The *macula* in the eye is a small spot where vision is keenest in the retina.

oedema/edema

Edema is the swelling of soft tissues as a result of excess water accumulations. Edema is often more prominent in the lower legs and feet toward the end of the day.

retina, retinal

The retina is the nerve layer that lines the back of the eye and senses light. A retinal detachment almost always affects only one eye.

vein

The femoral vein is the largest vein in the groin, and is a continuation of the popliteal vein. Varicose veins are often associated with incompetency of the valves in the vein.

occlusion

In terms of Medicine, *occlusion* is an obstruction or a closure of a passageway or vessel. *occlusion*, in a dental context, means simply the contact between teeth.

clot, blood clot

clot is a thick, viscous, or coagulated mass or lump, as of blood. A blood clot that forms inside a blood vessel and stays there is called a thrombus.

nutrients

A nutrient is a chemical that an organism needs to live and grow. The primary nutrients are nitrogen (N), phosphorus (P), and potassium (K).

swelling

swelling is the transient enlargement or protuberance in the body and may include tumors. Mild swelling will usually go away on its own.

atherosclerosis

Atherosclerosis is also known as *arteriosclerotic vascular disease*, or *ASVD*. Atherosclerosis, hardening of the arteries, is the leading cause of heart attacks and stroke.

impairment

impairment may refer to a medical condition that leads to disability. Individuals with mild cognitive impairment are able to function in everyday activities...

degeneration

Age-related macular degeneration after the age of 60 progressively destroys the macula. Spongy degeneration of the central nervous system is also called Canavan disease.

steroid

A steroid is an organic compound with a characteristic arrangement of four cycloalkane rings. Steroids are drugs that mimic certain natural hormones in the body.

biodegradable

Biodegradable plastics made with plant-based materials have been available for many years. Biodegradable materials are broken down by the action of microorganisms.

implant

Cochlear implant is a hearing electronic device surgically placed within the inner ear. Cosmetic dentistry can improve your smile with dental implants.

- **Try to give your own examples using:** *implant, drain, oxygen, leak, affect, dissolve, tissue, underway, capsule, reverse, loss, lose.*

25 Fighting for the breath of life...

Crest made his own diagnosis without any doubt. He knew he was having a coronary heart attack. He was drowning in a sea of pressure and pain, but one small part of his consciousness, somehow uninvolved in the life struggle, was able to study the scene with scientific detachment. The observer, with X-ray eyes, seemed to be looking at Crest's heart.

The heart: tough elastic bundle of interconnecting muscle strands; a big fist, squeezing tight with a rotating motion, once a second, every second, from intra-uterine life to the moment of death, without a moment of rest. Inside, the four valve leaflets, opening, snapping shut: the mitral, shaped like a bishop's miter; and the tricuspid, with three teeth; and the two guarding the great arterial trunks, aortic and pulmonic. The electrical impulses controlling the beat; starting at the nodule between the auricles; traversing through the conducting cable of the bundle of His; splitting into the branch bundles to the right and left. The coronary arteries, small tributary vessels off the main aorta, hooking back to supply the muscle of the heart itself with blood. One of the coronary vessels in his heart showed corrosion in the lining, sludgy patches of cholesterol, like rust in a dirty pipe. The sludge in that vessel had caused narrowing; the blood stream slowed; and clotting suddenly occurred to block off the vessel completely. An area of heart muscle supplied by the blocked vessel was deprived of blood, blanching white, critically injured. Pain impulses from dying muscle fled up the nerves, causing the pressure and pain in the chest, throat, and arm. The area of injured tissue, perhaps the size of a quarter or a dime, would die. If the area was big enough so that the heart could no longer perform its thrusting pulsations, the heart would stop and he would die. If the mass of uninjured muscle could limp along efficiently, he would survive. Then the area of injury would turn dark and rot, like any dead bit of flesh; the processes of repair would begin; collagen fibers would creep into the area of decay; white scar tissue would form. If he was lucky, after a period of six or eight weeks, his heart would be almost as strong as it was before. If he was half lucky, his heart would function under limited activity but would not permit him to lead a normal life. Or he might die. He might die of shock; of heart stoppage; or, if the electrical impulses were badly disturbed by the area of injury, he might die of short circuit, a sort of internal self-electrocution. If the scar that formed was too weak, it might blow out like a badly patched tire. He might die suddenly of pulmonary embolism. Or he might die gradually of slowly progressing heart inefficiency.

detachment

Emotional detachment refers to an “inability to connect” with others emotionally.

Detachment is also a means of dealing with anxiety by preventing situations that trigger it.

bundle

bundle is a group of things fastened together for convenient handling.

Optical fiber bundle is a cable consisting of a collection of fiber optics.

interconnecting

to be interconnected means *to be connected reciprocally*.

We are moving forward with the *interconnection* of all kinds of devices via the Internet.

strands

strand (now poetic or archaic) is the flat area of land bordering a body of water, a beach.

strand (in *electronics*) is a group of wires, usually twisted or braided.

valve leaflets

The mitral valve is made up of two *valve leaflets* and a ring around the valve.

The normal aortic *valve* has 3 equal-sized *leaflets* or cusps with 3 lines of coaptation.

mitral

The *mitral* valve is also known as the bicuspid valve or left atrioventricular valve.

Mitral valve prolapse (MVP) is the most common heart valve abnormality.

miter

A *miter/mitre joint* is sometimes shortened to *miter*.

The liturgical headdress and part of the insignia of a Christian bishop is also called *miter/mitre*.

tricuspid

tricuspid valve, or right atrioventricular valve, is on the right dorsal side of the mammalian heart.

nodule

Most lung *nodules* are noncancerous, but some may represent early-stage lung cancer.

auricles

auricle, also called *pinna*, is the outer projecting portion of the ear.

The *auricles* are found (if present) at the base of the leaf blade.

thrusting

Thrust is a reaction force described quantitatively by Newton's second and third laws.

thrust means to *push* or *drive* quickly and forcibly.

collagen

Collagen is a group of naturally occurring proteins found in animals.

Collagen is the major insoluble fibrous protein in the extracellular matrix.

electrocution

Electrocution is a type of electric shock that, as determined by a stopped heart, can end life.

The term *electrocution* was coined about the time of the first use of the electric chair in 1890.

embolism

A pulmonary *embolism (PE)* is a sudden blockage in a lung artery.

Symptoms of *PE* include chest pain, anxiety, cough, sweating, shortness of breath, fainting.

- **Try to make some sentences of your own, using:** *breath, breathe, drown, consciousness, rotating, intra-uterine life, rest, aortic, pulmonic, coronary, beat, tributary, corrosion, sludge, sludgy, cholesterol, rust, clotting, blanching, dime, limp, decay.*

26 The framework which supports the body

Human skeleton consists of both fused and individual bones supported and supplemented by ligaments, tendons, muscles and cartilage. It serves as a scaffold which supports organs, anchors muscles, and protects organs such as the brain, lungs and heart. The biggest bone in the body is the femur in the thigh and the smallest is the stapes bone in the middle ear. In an adult, the skeleton comprises around 30-40% of the total body weight, and half of this weight is water.

Fused bones include those of the pelvis and the cranium. Not all bones are interconnected directly: there are three bones in each middle ear called the ossicles that articulate only with each other. The hyoid bone, which is located in the neck and serves as the point of attachment for the tongue, does not articulate with any other bones in the body, being supported by muscles and ligaments.

Early in gestation, a fetus has a cartilaginous skeleton from which the long bones and most other bones gradually form throughout the remaining gestation period and for years after birth in a process called endochondral ossification. The flat bones of the skull and the clavicles are formed from connective tissue in a process known as intramembranous ossification, and ossification of the mandible occurs in the fibrous membrane covering the outer surfaces of Meckel's cartilages. At birth, a newborn baby has over 300 bones, whereas on average an adult human has 206 bones; these numbers can vary slightly from individual to individual. The difference comes from a number of small bones that fuse together during growth, such as the sacrum and coccyx of the vertebral column.

The skeleton provides the framework which supports the body and maintains its shape. The pelvis and associated ligaments and muscles provide a floor for the pelvic structures. Without the ribs, costal cartilages, the intercostal muscles and the heart would collapse. The joints between bones permit movement, some allowing a wider range of movement than others, e.g. the ball and socket joint allows a greater range of movement than the pivot joint at the neck. Movement is powered by skeletal muscles, which are attached to the skeleton at various sites on bones. Muscles, bones, and joints provide the principal mechanics for movement, all coordinated by the nervous system.

ligaments

One or more ligaments provide stability to a joint during rest and movement.

tendons

In the spine, tendons connect muscles to the vertebrae.

cartilage, cartilaginous

The cartilaginous discs between vertebrae absorb and distribute shock.

femur

The two main bones of the knee are the femur and the tibia.

stapes

The drum vibrates as do the three bones of hearing, the malleus, incus and stapes.

pelvis

The two sides of the pelvis are actually three bones – ilium, ischium, and pubis.

cranium

The skull is composed of two parts: the cranium and the mandible.

ossicles

The ossicles (also called auditory ossicles) are the three smallest bones in the human body.

articulate

The new robot's arm was articulate in two directions.

hyoid

The hyoid bone (lingual bone) is a horseshoe-shaped bone in the anterior midline of the neck.

endochondral ossification

Endochondral ossification involves the replacement of a cartilage model by bone.

intramembranous ossification

Intramembranous ossification is the process by which flat bones are created in fetuses.

clavicles

Clavicle (collar bone), curved like the letter f, articulates with the sternum and scapula.

mandible

In vertebrates, the mandible, lower jaw is a bone forming the skull with the cranium.

sacrum

The sacrum is a shield-shaped bony structure located at the base of the lumbar vertebrae.

coccyx

The coccyx, commonly referred to as the tailbone, is the final segment of the vertebral column.

vertebral column

The vertebral column is composed of a series of 31 separate bones known as vertebrae.

costal cartilages

The costal cartilages are bars of hyaline cartilage which serve to prolong the ribs forward.

intercostal muscles

Intercostal muscles run between the ribs, and help form and move the chest wall.

pivot joint

In vertebrate anatomy, pivot joint is a joint that allows only rotary movement.

coordinated

Examples of motor coordination are the ease with which people can stand up, walk, etc.

- **What about making some examples with:** *skeleton, vertebral column, muscles, fused, scaffold, thigh, neck, ribs, gestation, fetus, joint, pivot joint, ball and socket joint?*

27 The house of ill repute

The Latin word *diverticulum* means ‘wayside house of ill repute’: *diverticulae* are small pouches that protrude from any tubular structure in the body, such as the gullet, but they are most commonly seen in the large intestine. These pouches occur at a weakness in the muscle walls of the intestine, causing the lining to bulge out. The presence of multiple *diverticulae* is referred to as *diverticulosis*, and 70 per cent of those with *diverticulosis* have no symptoms. However, the condition starts to cause problems when the *diverticulae* – which can be from 3mm to 3cm – start to bleed or become inflamed. This is called *diverticulitis* and symptoms include abdominal pain, temperature and blood in stools. *Diverticulosis* is rare in people under the age of 40, but becomes increasingly common with age – everyone of 90 will have multiple *diverticulae*. The cause is thought to be a lifelong low-fibre diet; this leads to an increase in the pressure inside the large intestine which causes the lining to bulge. The condition is usually diagnosed through symptoms, but can also be observed, incidentally during surgery or scans for other complaints. Counter-intuitively, the pressure in the intestine is reduced when it is stretched by a greater volume of contents; that is why increasing the bulk contents of the diet – and eating more fibre – minimises the chances of *diverticulosis*.

Ten to twenty per cent of patients with *diverticulae* will experience painful inflammation at some stage, and it can usually be treated with antibiotics to kill the bacteria triggering the inflammation. However, if it is a recurrent problem, the section of bowel might have to be removed. Patients are advised to avoid seeds on the belief that they might become impacted in one of these pouches and trigger inflammation and infection. However, it is inevitable that faeces will become impacted in the pouches at times. This is because the large intestine is essentially a large compost heap and contains material of different shapes and sizes. But because the intestine is in a constant state of muscular movement, these waves of movement will invariably dislodge the material from the pouches. And so the message to the patients is: eat a high-fibre diet of fruits, salads, vegetables, grains and seeds. For many people, taking up such a regimen late in life might appear to be shutting the stable door after the horse has bolted, but it does at least lower the pressure in the intestinal wall and, hopefully, minimise the worsening of the *diverticulosis*.

tubular

Tubular bells are musical instruments, also known as chimes, in the percussion family. A tubular tyre is referred to as a *tub* in Britain, a *sew-up* in the US, a *single* in Australia.

gullet

gullet refers to mouth and throat, especially when you are shoving food down it. Gastroscopy is an examination of the inside of the gullet, stomach and duodenum.

intestine

intestine is the portion of the alimentary canal extending from the stomach to the anus. Small intestine is a long tube that connects your stomach to your large intestine.

bleed

Bleeding is the loss of blood or blood escape from the circulatory system. My heart bleeds at my friend's misfortune.

inflamed

That politician's angry speech inflamed the mob. Unfortunately, a series of crimes occurred recently that inflamed the entire community.

inflammation

Inflammation is a basic way in which the body reacts to infection, irritation or other injury. Redness, warmth, swelling, and pain are the hallmarks of inflammation.

stool

The child's doctor ordered a stool collection test to check for bacteria, ova, or parasites. If the intestinal contents travel at a normal speed, stool is light to dark brown.

scan

CT scan is an x-ray procedure which combines many x-ray images. Bone density scanning measures bone mineral density,

antibiotics

If antibiotic treatment stops too soon, some bacteria may survive and re-infect you. Did you know that antibiotics do not help fight viruses?

recurrent

Recurrent aural vertigo is a condition also known as Meniere's disease. Damage to the recurrent laryngeal nerve causes laryngeal palsy – paralysis of the larynx.

bowel

IBS, irritable bowel syndrome, is a gastrointestinal disorder involving abnormal gut contractions. Crohn's disease (CD) and ulcerative colitis (UC) are inflammatory bowel diseases (IBD).

infection

An upper respiratory infection is a contagious infection of the upper respiratory tract. Not everyone with a urinary tract infection (UTI) has obvious symptoms.

faeces

faeces/feces is the scientific term for the "excrement discharged from the intestines." Until the 17th century *feces* merely meant the "dregs or sediment" of wine.

compost

Compost is decomposed vegetable matter, full of nutrients and helpful bacteria. Molds can be found in compost piles and on certain grasses and weeds.

- **Can you give your own examples using:** *repute, pouch, protrude, bulge out, lining, fibre, diet, observe, intuitively, chance, trigger, impacted, dislodge, regimen?*

28 How beneficial is a cupping treatment?

Medical science has come a long way in the 400 years since William Harvey discovered the circulation of the blood. Anaesthetics, an appreciation of the importance of clean water, penicillin and cracking the human genome are but a few of its more notable achievements. The red welts seen on the backs of some film stars wearing low-cut dresses, however, remind us in recent years of a form of traditional treatment. The large, round red weals are in fact marks caused by an alternative therapy known as “cupping”. The treatment, credited with everything from relieving aches and pains, is believed to have originated in China and was brought to Europe by the Jesuits in the 13th or 14th century. Various descriptions as a “form of acupuncture” or “middle-class leeching”, it involves placing a heated (preferably thick) glass cup upside down on the skin. As the air inside the cup cools, it creates a vacuum and, so the theory goes, stimulates blood flow and sucks the “toxins” out of the body.

Mr. Nish Yoshi, described in London as “the super-immunity man to the stars”, offers a range of alternative treatments including acupuncture, homeopathy and Ayurvedic medicine – in which pulse and tongue diagnosis are used “to assist in the herbal treatment of medical conditions without the side-effects of modern medicine”. According to him, “cupping” works by “drawing toxins trapped in the tissues and lymphatic channels into the blood stream” and thereby gives “a kick-start to getting the toxins in our bodies moving”. Used in conjunction with herbal supplements, “dramatic” results are promised, including “freedom from bloating, constipation and lethargy”.

To many medical specialists this is only comic. A surgeon points out: – Isn't it just a little too convenient that all those toxins are congregated at the top of one's skin, just where the cups are placed? – Others say that “cupping” is just a posh version of leeching, and an extraordinary expensive one at that, and that they would “rather spend the money on a personal trainer than this hippy claptrap.” Prof Edzard Ernst, the director of the department of complementary medicine at the University of Exeter, also dismisses “cupping”: – It's been around for thousands of years but there is no evidence it works. For a start, I would like them to define what these toxins are in our bodies that are supposed to be poisoning us? ... In any case, we already have a number of organs that detoxify the body. They are called the liver and kidneys, and they are pretty good at it.

cracking

Software cracking is the modification to remove/disable features considered undesirable. A cracker is someone who breaks into someone else's computer system, often on a network.

genome

The genome includes both the genes and the non-coding sequences of the DNA/RNA. In Greek, the word genome means "I become; I am born; to come into being".

welts

Welts are bumps in the skin caused by a buildup of fluids. When swelling or welts occur around the lips and eyes, it is called angioedema.

weals

The surface weals may be accompanied by deeper swelling of eyelids, lips, hands, ... Sometimes weals next to each other join together to form larger ones.

acupuncture

Traditional acupuncture involves insertion of stainless steel needles into various body areas. Acupuncture has been embedded in the concepts of Traditional Chinese medicine (TCM).

leeching

In pre-scientific medicine, leeching was an alternative form of bloodletting. In leeching, "bad" blood used to be removed via leeches instead of by bleeding.

vacuum

In everyday usage, vacuum is a volume of space that is essentially empty of matter. perfect vacuum would be one with no particles in it at all (impossible to achieve in practice!).

homeopathy

Homeopathic remedies were less dangerous than those of XIX-century medical orthodoxy. Homeopathy involves treating the individual with highly diluted substances.

Ayurvedic medicine

Ayurvedic medicine is considered to be the world's oldest healthcare system. Ayurvedic medicine is a system of medicine that originated in India over 5000 years ago.

bloating

Bloating is any abnormal general swelling, or increase in diameter of the abdominal area. To get rid of bloating, one is advised to cut out 'windy' foods and fizzy drinks.

constipation

Constipation is also known as costiveness, dyschezia, and dyssynergic defaecation. Constipation refers to bowel movements that are infrequent or hard to pass.

lethargy

Lethargy can be caused by everything from a poor diet to psychological disorders. Lethargy can be a normal response to inadequate sleep, overexertion, stress, lack of exercise.

congregated

congregate means to bring or come together in a group, crowd, or assembly. Then she left her room to make her way to the garden where the guests were congregating.

posh

By the late 1880s, the older meaning of posh was money, the newer one was dandy. For Brits and Victorianists, the word posh always meant classy and luxurious.

- **Can you give your own examples for:** appreciation, penicillin, credit, credited, herbs, herbal, side-effects, kick-start, in conjunction with, dramatic, hippy, hippy claptrap, detoxify?

29 Hypothyroidism and the harm it causes

Hypothyroidism is one of the most common endocrinal disorders, with a prevalence of 0.5-1% in the general population. It can cause a variety of signs and symptoms reflecting the involvement of central nervous system, peripheral nerves, and muscles. Entrapment neuropathies and myopathies are most frequently observed. Axonal sensorimotor polyneuropathy with predominant impairment of large myelinated fibres has been reported in about 40% of patients, and painful small fibre neuropathies have been described.

Whether subclinical hypothyroidism can affect peripheral nerves remains uncertain. Axonal neuropathy has been described in patients with normal thyroid hormone level and increased serum TSH, or abnormal TSH level to TRH stimulation. Nevertheless, certain authors did not find peripheral nerve abnormalities in patients with similar hormone dysfunctions. In this patient, the temporal relationship between the onset of neuropathy and the response to replacement hormone therapy is in favour of a pathogenetic correlation. In particular, the significant decrease in neuropathic pain severity, achieved without any analgesic treatment, paralleled the improvement of sensory nerve conduction and the regeneration of cutaneous nerves, reflecting the recovery both of large and small fibres. Previous authors reported that replacement hormone treatment can improve symptoms, and in some patients, also neurophysiological abnormalities in about 3 months.

The relationship between skin innervation density and neuropathic pain remains partly unaddressed. In painful neuropathies of different aetiology, including HIV and diabetes-related neuropathies, IENF density did not correlate with pain intensity, although patients with pain had a lower innervation density than those without pain. Nevertheless, patients can experience a decrease of neuropathic pain intensity after skin nerve regeneration, as it has been reported in pre-diabetes and steroid-responsive neuropathy. Therefore, it can be currently assumed that the loss of IENF is associated with the risk of developing neuropathic pain, the intensity of which can decrease after skin reinnervation. Skin biopsy, a reliable technique to detect early neuropathy and to monitor its progression, can be therefore used as an outcome measure to assess the response to neuroprotective treatments in peripheral neuropathies.

involvement

Parent involvement in education is essential to school reform.

involvement (in medicine) refers to inclusion in an area affected by disease, trauma, or insult.

entrapment

A person is entrapped when he is induced by law enforcement officers to commit a crime.

In many jurisdictions, entrapment is a possible defense against criminal liability.

myopathies

A myopathy is a muscular disease in which the muscle fibers do not function.

Myopathies are a class of skeletal muscle disease not caused by nerve dysfunction.

serum

Blood serum is a component of blood which is collected after coagulation.

Blood serum is blood plasma without fibrinogen or the other clotting factors.

stimulation

Stimulation is the action of various agents (stimuli) on nerves, muscles, or a sensory end organ.

To treat his extreme form of Tourette syndrome, the patient underwent deep brain stimulation.

dysfunctions

A medical cause must be ruled out prior to making any sexual dysfunction diagnosis.

Manifest functions and dysfunctions are conscious and deliberate.

severity

severity refers to an act or an instance of severe behavior, especially punishment.

To be severe means to be of a strict or stern bearing or manner, to be austere.

analgesic

An analgesic (a painkiller) is any member of the group of drugs used to relieve pain.

There are basically two kinds of analgesics: non-narcotics and narcotics.

cutaneous

In cutaneous candidiasis, the skin is infected with candida fungi.

Cutaneous larva migrans (CLM) is the most common tropically acquired dermatosis.

innervations

innervation refers to the distribution or supply of nerves to a part.

Cutaneous innervation refers to the area of the skin supplied by a specific cutaneous nerve.

unaddressed

Questions that remain unaddressed are those not brought up for discussion or solution.

Unaddressed letters are the letters not containing the required address.

aetiology

Aetiology is the study of the causes, for example of a disorder.

Aetiology is the preferred spelling in the UK, whereas etiology has taken over in the US.

decrease

decrease refers to growing progressively less, as in size, amount, number, or intensity.

A significant decrease in urine output may indicate a serious, even life-threatening condition.

biopsy

A biopsy is the removal of a small piece of tissue for laboratory examination.

There are many different types of biopsy procedures.

- **In sentences of your own, illustrate the meanings of:** hypothyroidism, endocrinal disorders, prevalence, symptoms, abnormal, reflecting, involvement, peripheral, abnormalities, onset, replacement, correlation, HIV, diabetes, regeneration, reported, reinnervation, monitor, progression.

30 I've caught that new computer virus!

I know. I have an internet history that reads like an Anatomy textbook to prove it. Like many of my other ailments, there is a name for my condition. It's called cyberchondria, and it's spreading fast. Symptoms include having NetDoctor or WebMD on your favourite website lists, being overly familiar with the symptoms of a brain tumour and having a rich medical vocabulary. And I'm not the only one who suffers from it. According to research by the Maudsley Hospital in London, GPs spend the equivalent of one day a week reassuring patients who turn up clutching reams of printed symptoms, convinced they are suffering from everything from Turner Syndrome to a Transient Ischaemic Attack. The fact I even know these words is worrying in itself.

Women are more likely to be cyberchondriacs than men. Psychologists reckon it's because men won't allow themselves to be vulnerable. Personally, I think it's just laziness. We women, on the other hand, have to remain vigilant about everything. We are the guardians of the family's health.

I've been struggling with cyberchondria for some time. My most recent scare came when I was sent for a health MOT for a work assignment. Surprisingly, given the fact I'm a walking medical dictionary, neither the nurse nor the doctor could find anything wrong with me. Until... "You have a trace of blood in your urine," the doctor told me. "It's nothing to worry about." Telling me not to worry about something like that! I did my best to fight it, but on the way home I ended up Googling 'blood in urine' on my iPhone in the middle of the Marks & Spencer food hall. True, there was a bit of stuff on how common it was, how sometimes there was no explanation – but I was too drawn to the words 'bladder cancer'.

My husband was less than sympathetic. But then he has already nursed me through cardiac arrhythmia and a couple of brain tumours, not to mention the time I woke up with MS (turns out I'd slept on my arm). He made me check the website again. It said bladder cancer generally occurred in heavy smokers who were over 70 – and men. But what did that prove? I was panic-stricken, until I developed a worrying twitch over my right eye and convinced myself I had Bell's Palsy. At least that took my mind off the bladder cancer.

ailments

*Ailment is a physical or mental disorder, especially a mild but often persistent illness.
It is good to get information on major health ailments and issues, about risks, prevention, etc.*

clutching

*The bird swooped down and clutched its prey with its claws.
She clutched the child's hand as they were crossing the street.*

reams

*ream is a quantity of paper, once 480 sheets, now 500 or, in a printer's ream, 516 sheets.
ream refers to a very large amount and is often used in plural; e.g. reams of work to do.*

Turner Syndrome

*Turner syndrome is an abnormality in the X chromosome of females that leaves them infertile.
The most common feature of Turner syndrome is short stature.*

Transient Ischaemic Attack (TIA)

*A TIA is a mini-stroke that warns of an impending stroke within hours, days, weeks or months.
Some doctors and some people call a Transient Ischaemic Attack a mini-stroke.*

cyberchondriacs

*Cyberchondriac was a word of the year in 2008 for the Webster's New World Dictionary.
Cyberchondriacs are those who go online for healthcare information.*

reckon

*reckon means to make an enumeration or computation; to engage in numbering or computing.
I reckon he won't try that again, don't worry.*

vigilant

*When traveling through the city, tourists should be extra vigilant.
They were vigilant about protecting their children.*

MOT

*The Ministry of Transport (MOT) test is an annual test of automobile safety.
MOT also tests vehicle roadworthiness aspects and exhaust emissions required.*

trace

*trace is a visible mark, a footprint, made or left by the passage of a person, animal, or thing.
trace refers to evidence or an indication of the former presence or existence of something.*

arrhythmia

*An arrhythmia is a problem with the rate or rhythm of the heartbeat.
During an arrhythmia, the heart can beat too fast, too slow, or with an irregular rhythm.*

MS

*What are the symptoms associated with the onset of multiple sclerosis (MS)?
In MS, the body's own immune system attacks and damages the myelin.*

twitch

*twitch means to move or pull with a sudden motion, to jerk.
Her mouth was twitching as she began to cry.*

Bell's Palsy

*Bell's palsy is a paralysis or weakness of the muscles on one side of one's face.
Bell's palsy develops suddenly, due to a cause which is not clear.*

- **Can you now make sentences with:** reassuring, anatomy, turn up, lazy, laziness, vulnerable, trace, scare, sympathy, sympathize, sympathetic, urine, urinate?

31 Images travel as electrical impulses

The eye is a delicate organ, protected by a number of structures: the skull bones form the walls of the eye orbit (cavity) and protect more than half of the posterior part of the eyeball. The upper and lower eyelids aid in protecting the eye's anterior portion. The eyelashes and eyebrow help to keep foreign matter out of the eye. The conjunctiva, lines the inner surface of the eyelids and covers the visible portion of the white of the eye (sclera). Tears produced by the lacrimal glands lubricate the eye and contain an enzyme that protects against infection.

The orbit is a bony cavity that contains the eyeball, muscles, nerves, and blood vessels, as well as the structures that produce and drain tears. The eye has a relatively tough white outer layer called sclera (or the white of the eye). The sclera is covered by a thin mucous membrane, the conjunctiva, which runs to the edge of the cornea and also covers the moist back surface of the eyelids. Light enters the eye through the cornea, a transparent dome on the front surface of the eye. The cornea serves as a protective covering for the front of the eye and also helps focus light on the retina at the back of the eye. Having passed through the cornea, light travels through the pupil (the black dot in the middle of the iris), which is actually a hole through the iris. The iris, the circular colored area of the eye, controls the amount of light that enters the eye so that the pupil dilates (enlarges) and constricts (shrinks). The size of the pupil is controlled by the action of the pupillary sphincter muscle and dilator muscle. The lens is located behind the iris. By changing its shape, the lens focuses light onto the retina. Through the action of small ciliary muscles, the lens becomes thicker to focus on nearby objects and thinner to focus on distant objects. The retina contains the cells that sense light (photoreceptors) and blood vessels that nourish them. The most sensitive part of the retina is a small area called the macula, which contains millions of photoreceptors, whose density makes the visual image detailed. The nerve fibers from the photoreceptors are bundled together to form the optic nerve. The optic disk, the first part of the optic nerve, is at the back of the eye. The photoreceptors in the retina convert the image into electrical impulses, which are carried to the brain by the optic nerve. There are two main types of photoreceptors, cones and rods. Cones are responsible for sharp, detailed central vision and color vision and are clustered mainly in the macula. The rods, responsible for night and peripheral (side) vision, are more numerous than cones and much more sensitive to light, but they do not register color. They are grouped mainly in the peripheral areas of the retina.

orbit

orbit is the bony cavity in which the eyeball sits.

A sinus infection can also spread into the orbit of the eye, possibly causing blindness.

eyelids

An eyelid is a thin fold of skin that covers and protects an eye.

Trachoma is diagnosed by examining the eyes and eyelids.

conjunctiva

Conjunctiva is a thin clear moist membrane that coats the inner surfaces of the eyelids.

A subconjunctival hemorrhage is bleeding under the eye's conjunctiva.

sclera

Sclera covers approximately the posterior five-sixths of the eyeball's surface.

Bilirubin turns the skin and whites of the eye (sclera) yellow.

lacrimal

The lacrimal glands are paired almond-shaped glands, one for each eye.

The lacrimal glands secrete the aqueous layer of the tear film.

cornea

The cornea is the transparent, dome-shaped window covering the front of the eye.

Together with the lens, the cornea refracts light.

retina

The vertebrate retina is a light-sensitive tissue lining the inner surface of the eye.

The retina is a layered structure with several layers of neurons interconnected by synapses.

pupil

The pupil is a hole located in the center of the iris of the eye that allows light to enter the retina.

The sympathetic nerve system can dilate the pupil in two ways:

iris

The iris is a contractile structure, consisting mainly of smooth muscle, surrounding the pupil.

The iris (pl. irides, rarely irises) is responsible for controlling the diameter and size of the pupils.

sphincter

There are over fifty (!) sphincters in the human body.

Sphincters prove effective in the mediation of the entrance or release of liquids and fluids.

photoreceptors

Photoreceptor cells are photosensitive cells in the retina of vertebrate eyes.

Photoreceptor protein is a chromoprotein responding to being exposed to a certain wavelength.

macula

The macula or macula lutea is an oval-shaped yellow spot near the center of the retina.

As the macula is yellow in colour, it absorbs excess blue and ultraviolet light that enter the eye.

cones

Cones are the light-sensitive cells in the retina of the eye that provide sharp central vision.

The cone dystrophies are characterized by progressive deterioration of the cones.

rods

Rods are photoreceptors in the retina of the eye that provide side vision.

Rods also provide the ability to see objects in dim light (night vision).

- **What about making some examples with:** images, structures, anterior, eyeball, eyelashes, eyebrow, foreign matter, white of the eye, lubricate, tears, dome, back of the eye, dilates, dilator, lens, bundled?

32 Infectious diseases

Many diseases are caused by a recent or remote invasion or infection of the tissues of the host by a parasite (virus, bacterium, protozoon, metazoon, or fungus). The parasite (causal organism) is potentially transmissible from one host to another; hence such diseases are infective. Among them are some caused by readily transmissible specific parasites, and these are known as the specific, or acute specific, infectious diseases or "fevers", since "fever", which implies raised temperature and quickened pulse, is a characteristic symptom. Infection is commonly conveyed directly from one person to another. Save in the enteric group of diseases, where infection is spread by articles of drink or food, and in certain diseases such as plague, typhus, and malaria transmitted by the medium of infected insects, the usual mode of spread is by spray or droplets projected through short distances by sneezing or coughing. The role played by fomites, e.g. utensils, bedding, letters, or dust is in the light of recent research assuming increasing importance.

A carrier is one who, although not himself suffering from the specific disease, harbours, and is thus in a position to spread, the causal organism. The carrier state may persist for a varying period after a frank clinical attack of the disease which has rendered the patient himself immune. Such persons are termed "convalescent carriers". Persons who have passed through no recognisable clinical attack of the disease can yet carry specific organisms and be immune to the disease; they are healthy or contact carriers whose immunity has been acquired by small repeated sub-clinical doses of infection. The carrier state may be transient or permanent. Non-immunes may carry temporarily, e.g. during latent infection or while incubating the disease.

Between infection and clinical attack is a latent period termed the incubation period, which varies with each disease, and, within certain limits, for the same disease. During incubation the organisms are multiplying and probably in large part being destroyed by the tissues, but ultimately the organisms or their products gain the upper hand, overcome the resistance of the host, and initiate that complex of symptoms and signs by which the "disease" is recognised. Variations, or apparent variations, in the length of the incubation period of the same disease may depend on: difficulty in fixing accurately the actual date upon which infection took place; variations in size and virulence of the initial infecting dose and in the existing basal immunity of the host; an ill-defined onset, particularly characteristic of typhoid fever and whooping-cough.

infectious

Infectious diseases are also known as communicable, contagious, or transmissible ones. Infectious diseases may be asymptomatic for much or all of their course.

protozoon

protozoa, or protozoans, are a diverse group of single-cell eukaryotic organisms. Protozoans are unicellular organisms which subsist entirely on other organisms for food.

metazoon

metazoa, metazoon Animals, are classified as the kingdom Animalia or Metazoa. Metazoa are multicellular, capable of locomotion and responsive to their environment.

fungus

A mushroom is only one type of fungus. Some fungi reproduce through tiny spores in the air.

enteric

enteric is a general term describing something related to or associated with the intestines. enteric pathogens can cause mild gastroenteritis, but also life-threatening systemic infections.

plague

plague is a zoonotic disease circulating mainly among small animals and their fleas. In the early 1330s an outbreak of deadly bubonic plague occurred in China.

typhus

Typhus is caused by one of two types of bacteria: *Rickettsia typhi* or *Rickettsia prowazekii*. Endemic typhus is sometimes called "jail fever."

malaria

Malaria is a mosquito-borne infectious disease of humans and other animals. Malaria can also be transmitted from a mother to her unborn baby and by blood transfusions.

fomites

fomite is a term for any inanimate object that can carry disease-causing organisms. Germs can survive on fomites for minutes, hours, or even days in some cases.

medium

medium is a means of effecting or conveying something. medium also refers to the element that is the natural habitat of an organism.

immune, immunity

immune means protected from a disease or the like, as by inoculation. In Medicine, immunity refers to resistance of an organism to infection or disease.

incubating

incubate means to cause (eggs, embryos, bacteria, etc.) to develop. incubating means maintaining a chemical or biochemical system under specific conditions.

virulence

Virulence factors allow an organism to be established in a host or to maintain the disease state. In Bacteriology, virulent agent is an agent which causes clinical symptoms.

basal

Basal cell carcinoma is the most common type of skin cancer. Basal temperature usually refers to a person's temperature on awakening in the morning.

- **Do you understand the meaning of the words:** invasion, transmissible, pulse, droplets, diseases, sneezing, coughing, whooping-cough, frank, transient, resistance, onset, host, carrier, latent, parasite, spray?

33 Is alcohol good for you?

Most adults can drink moderate quantities of alcohol – up to two drinks per day for men and one drink per day for women and older people – and avoid alcohol-related problems. (One drink equals one 12-ounce bottle of beer or wine cooler, one 5-ounce glass of wine, or 1.5 ounces of 80-proof distilled spirits.) However, certain people should not drink at all. They include women who are pregnant or trying to become pregnant; people who plan to drive or engage in other activities requiring alertness and skill; people taking certain medications, including certain over-the-counter medicines; people with medical conditions that can be worsened by drinking; recovering alcoholics; and people under the age of 21.

Are women and men affected differently? Yes. Women become more intoxicated than men after drinking the same amount of alcohol, even when differences in body weight are taken into account. This is because women's bodies have proportionately less water than men's bodies. Because alcohol mixes with body water, a given amount of alcohol becomes more highly concentrated in a woman's body than in a man's. That is why the recommended drinking limit for women is lower than for men. In addition, chronic alcohol abuse takes a heavier physical toll on women than on men. Alcohol dependence and related medical problems, such as brain and liver damage, progress more rapidly in women than in men.

What is a safe level of drinking? Several studies have reported that moderate drinkers – those who have one or two drinks per day – are less likely to develop heart disease than people who do not drink any alcohol or who drink larger amounts. Small amounts of alcohol may help protect against coronary heart disease by raising levels of “good” HDL cholesterol and by reducing the risk of blood clots in the coronary arteries. If you are a nondrinker, you should not start drinking only to benefit your heart. Protection against coronary heart disease may be obtained through regular physical activity and a low-fat diet. And if you are pregnant, planning to become pregnant, have been diagnosed as alcoholic, or have any medical condition that could make alcohol use harmful, you should not drink. Even for those who can drink safely and choose to do so, moderation is the key. Heavy drinking can actually increase the risk of heart failure, stroke, and high blood pressure, as well as cause many other medical problems, such as liver cirrhosis.

ounce

An *ounce* of prevention is worth a pound of cure.

The *ounce* (abbreviated: *oz*) is a unit of mass equal to approximately 28 grams.

A *fluid ounce* (*fl. oz.* or *oz. fl.*) is a unit of volume equal to about 28.4 mL in the imperial system.

wine cooler

A *wine cooler* is an alcoholic beverage made from wine and fruit juice.

Wine coolers have been bottled and sold by commercial distributors since the early 1980s.

The wine used in wine coolers tends to be of the cheapest available grade.

distilled

Distilled water is water that has many of its impurities removed through *distillation*.

Distillation is a unit operation, or a physical separation process, and not a chemical reaction.

distilled spirits

Distilled spirit is alcoholic beverage obtained by distillation from wine or other fermented fruit.

Distilled spirits are the base ingredients for the majority of cocktails.

alertness

Alertness is the state of paying close attention, being watchful and prompt to meet danger.

A coma is a state of decreased *alertness* from which a patient cannot be awakened.

over-the-counter medicines

Over-the-counter (OTC) medicines are drugs you can buy without a prescription.

Rules for reimbursing the cost of *over-the-counter medicines* are changed frequently.

toll

toll refers to a tax/fee paid for some liberty or privilege (as of passing over a highway or bridge).

Toll plaza is a facility where tolls are collected, on modern toll roads, tunnels, and bridges.

Tolling a bell refers to the slow ringing of a bell, about once every four to ten seconds.

HDL

High-density lipoprotein (HDL) is one of the five major groups of lipoproteins.

A high *HDL* cholesterol level helps fight heart disease.

HDL cholesterol

HDL transports *cholesterol*, to the liver or steroidogenic organs (adrenals, ovary, testes).

HDL (good) cholesterol scours the walls of blood vessels, cleaning out excess cholesterol.

Moderate physical activity can help raise *high-density lipoprotein (HDL)* cholesterol.

diagnosed

Diagnosis is the identification of the nature and cause of anything.

A definitive *diagnosis* of Alzheimer's disease can be made only through autopsy after death.

cirrhosis

Cirrhosis is a consequence of chronic liver disease.

Cirrhosis is a life-threatening condition that scars the liver.

Cirrhosis is most commonly caused by alcoholism, hepatitis B and C, and fatty liver disease.

liver cirrhosis

Liver *cirrhosis* is characterized by replacement of liver tissue by fibrosis and scar tissue.

In advanced stages of *cirrhosis* the only option is a liver transplant.

- **Make sentences of your own using:** *distill, alert, alertness, intoxicated, concentrated, limit, limited, chronic, chronical, chronicle, abuse, safe, harmful.*

34 The largest lymphatic organ in the body

Lymphatic organs are characterized by clusters of lymphocytes and other cells, such as macrophages, enmeshed in a framework of short, branching connective tissue fibers. The lymphocytes originate in the red bone marrow with other types of blood cells and are carried in the blood from the bone marrow to the lymphatic organs. When the body is exposed to microorganisms and other foreign substances, the lymphocytes proliferate within the lymphatic organs (lymph nodes, tonsils, spleen, thymus) and are sent in the blood to the site of the invasion.

Lymph Nodes are bean-shaped structures usually less than 2.5 cm in length. They are widely distributed throughout the body (except for the central nervous system) along the lymphatic pathways where they filter the lymph before it is returned to the blood. The three superficial regions on each side of the body where lymph nodes tend to cluster are the inguinal nodes in the groin, the axillary nodes in the armpit, and the cervical nodes in the neck.

Spleen is located in the upper left abdominal cavity, just beneath the diaphragm, and posterior to the stomach. It is similar to a lymph node in shape and structure but it is much larger. This largest lymphatic organ in the body is surrounded by a connective tissue capsule which extends inward to divide the organ into lobules. The spleen consists of two types of tissue called white pulp and red pulp. The white pulp is lymphatic tissue consisting mainly of lymphocytes around arteries. The red pulp consists of venous sinuses filled with blood and cords of lymphatic cells, such as lymphocytes and macrophages. Blood enters the spleen through the splenic artery, moves through the sinuses where it is filtered, then leaves through the splenic vein. The spleen filters blood in much the same way the lymph nodes filter lymph. Lymphocytes in the spleen react to pathogens in the blood and attempt to destroy them. Macrophages then engulf the resulting debris, the damaged cells, and the other large particles. The spleen, along with the liver, removes old and damaged erythrocytes from the circulating blood. Like other lymphatic tissue, it produces lymphocytes, especially in response to invading pathogens. The sinuses in the spleen are a reservoir for blood. In emergencies such as haemorrhage, smooth muscle in the vessel walls and in the capsule of the spleen contracts. This squeezes the blood out of the spleen into the general circulation.

lymphocytes

A lymphocyte is a type of white blood cell in the vertebrate immune system. Lymphocytes are complex cells that direct the body's immune system.

macrophages

Macrophages are cells produced by the differentiation of monocytes in tissues.

Macrophages are *big eaters* in Greek, from *makros* "large" + *phagein* "eat"; abbr. MΦ.

enmeshed

In the *enmeshed* family everyone shares the other's life-system, like siamese twins.

Enmeshed family is a concept which arises from family systems theory.

tonsils

Tonsils and adenoids are part of the human lymphatic system.

Not everyone knows what *tonsils* do or why they may need to be removed.

proliferate

proliferate means to grow or multiply by rapidly producing new tissue, parts, cells, or offspring.

Nuclear proliferation is a term used to describe the spread of nuclear weapons.

spleen

The *spleen* is an organ found in virtually all vertebrate animals.

The spleen removes abnormal blood cells and making components of the immune system.

thymus

The *thymus* is a bilobed, greyish organ located in the thoracic cavity just below the neck.

The thymus is a gland that forms part of the immune system.

invasion

invasion is an act or instance of *invading* or *entering*.

invasive techniques require the entry of a needle, catheter, or the like into a part of the body.

inguinal

An *inguinal hernia* is a protrusion of abdominal-cavity contents through the *inguinal canal*.

Inguinal ("groin") hernias are by far the most common site for hernia development in adults.

groin

In human anatomy, the *groin* areas are the two creases at the junction of the torso with the legs.

A *groin pull* is a common sports injury that is due to a strain of the muscles of the inner thigh.

axillary

axillary means "related to the *axilla* (armpit)".

Axillary nerve dysfunction is a form of peripheral neuropathy.

armpit

armpit (plural *armpits*) is the cavity beneath the junction of the arm and shoulder.

The evolutionary significance of human *underarm hair* is still debated.

cervical

What are methods of treatment for *cervical cancer*?

The *cervix* is the lower end of the uterus.

lobules

lobule refers to a *small lobe* or a *subdivision of a lobe*.

A hepatic *lobule* is a small division of the liver defined at the histological scale.

- **Can you illustrate the meanings of:** *clusters, framework, bone marrow, originate, filter, diaphragm, posterior, capsule, pulp, cords, pathogens, debris, reservoir, emergencies, squeezes, superficial?*

35 Lymphatic system

The lymphatic system consists of a fluid – lymph, vessels that transport the lymph, and organs that contain lymphoid tissue. It is an extensive and interconnected system of vessels, spaces, and nodes in the body which circulates lymph. This system is very important because lymph performs a number of vital functions in the body, especially in the context of the immune system. Lymph is a fluid similar in composition to blood plasma. It is derived from blood plasma as fluids pass through capillary walls at the arterial end. Unlike the blood, lymph does not have a central pump, relying instead on muscle contractions and other natural functions of the body to force lymph through the lymphatic system, where it will eventually drain into the thoracic duct, which brings lymph back to the heart.

The lymphatic system has three primary functions. First of all, it returns excess interstitial fluid to the blood. Of the fluid that leaves the capillary, about 90 percent is returned. The 10 percent that does not return becomes part of the interstitial fluid that surrounds the tissue cells. Small protein molecules may “leak” through the capillary wall and increase the osmotic pressure of the interstitial fluid. This further inhibits the return of fluid into the capillaries, and fluid tends to accumulate in the tissue spaces. If this continues, blood volume and blood pressure decrease significantly and the volume of tissue fluid increases, which results in edema (swelling). Lymph capillaries pick up the excess interstitial fluid and proteins and return them to the venous blood. After the fluid enters the lymph capillaries, it is called lymph.

The second function of the lymphatic system is the absorption of fats and fat-soluble vitamins from the digestive system and the subsequent transport of these substances to the venous circulation. The mucosa that lines the small intestine is covered with fingerlike projections called villi. There are blood capillaries and special lymph capillaries, called lacteals, in the center of each villus. The blood capillaries absorb most nutrients, but the fats and fat-soluble vitamins are absorbed by the lacteals. The lymph in the lacteals has a milky appearance due to its high fat content and is called chyle.

The third and probably most well known function of the lymphatic system is defense against invading microorganisms and disease. Lymph nodes and other lymphatic organs filter the lymph to remove microorganisms and other foreign particles. Lymphatic organs contain lymphocytes that destroy invading organisms.

lymph

The lymph system is a network of organs, lymph nodes, lymph ducts, and lymph vessels. Lymph as an immune system fluid helps collect unwanted materials for removal from the body. Swollen lymph nodes can sometimes be extremely tender, painful, and disfiguring.

lymphoid

lymphoid is a term used to describe lymph or the lymphatic system.

The *lymphoid* system is traditionally divided into primary and secondary *lymphoid* tissues.

capillary

A *capillary* is an extremely small blood vessel located within the tissues of the body.

Unlike the arteries and veins, *capillaries* are very thin and fragile.

Capillary action is the result of adhesion and surface tension.

thoracic duct

The *thoracic duct* of the lymphatic system is the largest lymphatic vessel in the human body.

The thoracic duct conveys the greater part of the lymph and chyle into the blood.

Thoracic duct anatomy must be understood in the context of its embryology.

interstitial

Interstitial collagenase is the enzyme that breaks the peptide bonds in collagen.

Interstitials are www pages displayed before or after an expected content page.

osmotic pressure

Osmotic potential is the opposite of water potential.

A formula for calculating the osmotic pressure was first proposed by Jacobus H. van 't Hoff.

edema

Edema is swelling caused by fluid retention.

Edema is caused by either systemic diseases or local conditions.

mucosa

The gastric *mucosa* contains the glands and the gastric pits.

The *mucosa* is the innermost layer of the colon.

villus, villi

Chorionic *villus* sampling (CVS) is a test done during early pregnancy.

Chorionic *villus* sampling identifies chromosome abnormalities and other inherited disorders.

Intestinal *villi* are finger-like projections protruding from the epithelial lining of the intestinal wall.

lacteals

lacteal (anatomy) is one of the lymphatic vessels that serve the small intestine.

Lacteals are lymphatic vessels found in the small intestinal villi.

chyle

Chyle is a milky bodily fluid consisting of lymph and emulsified fats, or free fatty acids (FFAs).

Chyle leaks are a rather rare complication.

The term *chyle* comes from the Greek word *chylos*, meaning juice.

particles

A *particle* is a small localized object to which physical properties can be ascribed.

Particles are the constituents of what is usually referred to as *matter*.

In grammar, *particle* is a function word that does not belong to any of the inflected word classes.

- **Do you understand the words:** *vessels, nodes, plasma, eventual, eventually, drain, leak, leakage, invade, invading?*

36 The medium of transport in the body

Human blood, i.e. its fluid portion, the plasma, is composed primarily of water. All the important nutrients, the hormones, and the clotting proteins as well as the waste products are transported in the plasma. Red blood cells and white blood cells are also suspended in the plasma. Red blood cells, erythrocytes, are disk-shaped cells produced in the bone marrow. They have no nucleus, and their cytoplasm is filled with hemoglobin, a red-pigmented protein that binds loosely to oxygen atoms and carbon dioxide molecules. It is the mechanism of transport of these substances. Hemoglobin also binds to carbon monoxide, but this binding is irreversible, so it often leads to carbon-monoxide poisoning. A red blood cell circulates for about 120 days and is then destroyed in the spleen, an organ located near the stomach and composed primarily of lymph node tissue. When the red blood cell is destroyed, its iron component is preserved for reuse in the liver. The remainder of the hemoglobin converts to bilirubin, the chief pigment in human bile, which is produced in the liver. Red blood cells commonly have immune-stimulating polysaccharides called antigens on the surface of their cells.

White blood cells, leukocytes, are generally larger than red blood cells and have clearly defined nuclei. They are also produced in the bone marrow and have various functions in the body. Certain white blood cells called lymphocytes are essential components of the immune system. Other cells called neutrophils and monocytes function primarily as phagocytes; that is, they attack and engulf invading microorganisms. About 30% of the white blood cells are lymphocytes, about 60% are neutrophils, and about 8% are monocytes. The remaining white blood cells are eosinophils and basophils. Their functions are uncertain; however, basophils are believed to function in allergic responses.

Platelets, small disk-shaped blood fragments produced in the bone marrow, lack nuclei and are much smaller than erythrocytes. Also known technically as thrombocytes, they serve as the starting material for blood clotting. The platelets adhere to damaged blood vessel walls, and thromboplastin is liberated from the injured tissue. Thromboplastin, in turn, activates other clotting factors in the blood. Along with calcium ions and other factors, thromboplastin converts the blood protein prothrombin into thrombin. Thrombin then catalyzes the conversion of its blood protein fibrinogen into a protein called fibrin, which forms a patchwork mesh at the injury site. As blood cells are trapped in the mesh, a blood clot forms.

erythrocytes

Erythrocytes, red blood cells, are the most common type of blood cell.

bone marrow

In humans, bone marrow in large bones produces new blood cells.

cytoplasm

Movement of calcium ions in and out of the cytoplasm signals metabolic processes.

hemoglobin, haemoglobin

Hemoglobin is the iron-containing oxygen-transport metalloprotein in the red blood cells.

spleen

In humans, spleen is located in the left upper quadrant of the abdomen.

lymph node

Lymph nodes are garrisons of *B*, *T*, and other *immune cells*.

liver

There is currently no way to compensate for the absence of liver function long term.

bilirubin

Bilirubin is excreted in bile and urine, and elevated levels may indicate certain diseases.

polysaccharides

Polysaccharides are carbohydrate molecules, of repeating units joined by glycosidic bonds.

antigens

antigen is a foreign molecule that triggers the production of an antibody by the immune system.

leukocytes

Leukocytes are involved in defending the body against infectious disease or foreign materials.

lymphocytes

Under the microscope, lymphocytes can be divided into *large* and *small* lymphocytes.

neutrophils

Neutrophil granulocytes are the most abundant type of white blood cells in mammals.

monocytes

Monocytes are usually identified in stained smears by their large kidney shaped nucleus.

phagocytes

Phagocytes are crucial in fighting infections, as well as in maintaining healthy tissues.

eosinophils

In normal individuals, eosinophils make up about 1-6% of white blood cells.

basophils

Basophils contain large cytoplasmic granules obscuring the cell nucleus under the microscope.

thrombocytes

If the number of thrombocytes, or platelets, is too low, excessive bleeding can occur.

thromboplastin

Thromboplastin is a plasma protein aiding blood coagulation.

prothrombin, thrombin

Prothrombin forms thrombin in the first step of the coagulation cascade.

fibrinogen, fibrin

Fibrin consists of the blood proteins fibrinogen and thrombin.

- **Can you make sentences illustrating the meanings of:** *hormones, plasma, portion, nutrients, bile, suspended, circulate, clot, nucleus, poisoning, carbon dioxide, carbon monoxide, microorganisms, platelets, adhere, calcium, mesh?*

37 The mind making the body ill

Psychosomatic illnesses are those which have a mental origin but which are nevertheless organic. Despite the fact that there long existed no precise scientific proof of this, an opinion as to their existence has been strong since the days of ancient Greece, and in recent times various drug preparations have been concocted and sold which were supposed to overcome these sicknesses. Some success was experienced, sufficient to warrant a great deal of work on the part of researchers. Peptic ulcers (open sores in the stomach), for instance, have yielded to persuasion and environmental change. A drug called ACTH (a hormone that was sometimes used to combat symptoms of rheumatoid arthritis, the one believed to stimulate the production of other hormones in the body) has had astonishing but wildly unpredictable results. Allergies have been found to yield more or less to things which depressed histamine (a chemical compound in the tissues that causes many allergic reactions) in the body.

Psycho, of course, refers to mind and *somatic* refers to body; the term *psychosomatic* means the mind making the body ill or illnesses which have been created physically within the body by derangement of the mind. Naturally such diseases, when one has resolved the problem of human aberration, become uniformly susceptible to cure. Arthritis, dermatitis, allergies, asthma, some coronary difficulties, eye trouble, bursitis, ulcers, sinusitis, etc., form a very small section of the psychosomatic catalogue. Bizarre aches and pains in various portions of the body are generally psychosomatic. Migraine headaches are psychosomatic. About 70 percent of the physician's current roster of diseases fall into the category of psychosomatic illness. How many more can be so classified is difficult to predict, but it is certain that more illnesses are psychosomatic than have been so classified to date. That all illnesses are psychosomatic is, of course, absurd, for there exist, after all, life forms called germs, which have survival as *their* goal.

There are two kinds of illness: the first could be called *autogenetic*, which means that it originated within the organism and was self-generated; and *exogenetic*, which means that the origin of the illness was exterior. There are three stages of pathology: *predisposition*, by which is meant the factors which prepared the body for sickness; *precipitation*, by which is meant the factors which cause the sickness to manifest itself; and *perpetuation*, by which is meant the factors which cause the sickness to continue.

psychosomatic

A *psychosomatic* disorder is a disease which involves both mind and body.

concocted

concoct means *prepare* sth. by mixing various ingredients, especially *prepare food* for cooking.

peptic ulcers

A *peptic ulcer* is a sore in the lining of one's stomach or duodenum.

Many think that spicy foods cause *ulcers*, but the truth is that bacteria are the main culprit.

sores

sores are small skin ulcers, usually open from skin infection.

cold sores are small, painful, fluid-filled blisters or *sores* that appear on the lips.

arthritis, rheumatoid arthritis

Arthritis symptoms include pain, joint inflammation and swelling.

Rheumatoid arthritis is a chronic, inflammatory disorder that principally attacks synovial joints.

RA is a form of arthritis that causes pain, swelling, stiffness and loss of function in one's joints.

histamine

Histamine is an organic nitrogen compound involved in local immune responses.

Histamine can cause inflammation directly as well as indirectly.

derangement

derangement is a permutation in which none of the objects appear in their "natural" position.

derangement is a disturbance of normal bodily functioning or operation.

aberration

An *aberration* is something that deviates from the normal way.

dermatitis

What is the difference between atopic *dermatitis* and eczema?

Dermatitis is an itchy inflammation of the skin, not contagious or dangerous but uncomfortable.

bursitis

Bursitis is the inflammation of one or more *bursae* (small sacs) of synovial fluid in the body.

Near the inflamed *bursa* there is pain, tenderness, redness, warmth, and/or swelling.

sinusitis

In *sinusitis* the paranasal sinuses are inflamed, due to infection, allergy, or autoimmune issues.

Sinusitis wakes one up with headaches and swelling around the eyes.

roster

The doctors expertise provide a roster of local and international patients with health care skills.

Rosters are necessary for doctors to balance professional and personal commitments.

autogenetic

autogenesis is the supposed development of living organisms from nonliving matter.

autogenetic is something that has been self-generated.

exogenetic

exogenetic is something arising or growing from without, *exogenous*.

exogenetic are processes which occur at or near the earth's surface.

precipitation

Precipitation is the formation of a solid in a solution or inside another solid.

Precipitation is the condensation of a solid from a solution during a chemical reaction

perpetuation

Perpetuation is the act of prolonging existence.

- **Now try to make sentences of your own, using:** *ancient, drug, preparations, sicknesses, asthma, persuasion, environmental, combat, yield, resolved, predisposition, susceptible, catalogue, migraine.*

38 **Minimize the pressure on the spinal cord**

– Now we must get this man into the hospital. Since we suspect a fractured spine, we must move him very carefully. All five of us should lift him onto the stretcher together: very gently, very carefully. Your assistance would be appreciated, Dr. Parkindale.

There was no further argument. Parky helped, and they all lifted Joseph carefully onto the stretcher. Crest then followed the ambulance to the hospital; he supervised the transfer of the patient onto the bed. An oxygen tent was ordered. Crest started an intravenous and made arrangements for a blood transfusion to follow in order to overcome the element of shock. Then he had decisions to make. Should X-rays be taken? Motion of the back must be prevented in order to prevent any further damage to the spinal cord; rolling the patient on a hard X-ray table could be dangerous. A portable X-ray could be taken with the patient still in bed, but this would also involve some motion of the back, and a portable X-ray may be of poor technical quality. Crest decided to omit X-rays, even though this meant he did not know what bones were fractured and to what extent. There was also the question of surgery. If a fragment of loose bone were sticking into the spinal cord, it ought to be removed. On the other hand, it was just as dangerous to roll the patient on an operating table as on an X-ray table.

This type of decision was frequently encountered in an emergency: whether to be conservative or radical. Crest had always felt that when there was any question, the conservative approach was safer and gave the best results over all. Above all, *thou shalt do no harm!* Nevertheless, if he did nothing, and there were poor results, he would be open to criticism. Parky's attitude had left no doubt of that. In this particular case, it seemed that a poor result was inevitable: death or permanent disability.

In order to cover himself, Crest put in a long-distance call to the city, contacting the best neurosurgical specialist he knew. The specialist was very pleasant, very reassuring. Crest suspected that at the university the radical approach would have been chosen, but the specialist agreed that in this hospital, conservatism was best. The patient's condition was such, of course, that he could not be transferred to the city. Crest returned to Joseph's room and made sure that the patient was in the position of hyperextension of the spine, which position would force bone fragments outward and minimize the pressure on the spinal cord. There was nothing else to do but watch and hope and, possibly, pray.

stretcher

stretcher is a medical device used to carry an incapacitated person from one place to another. A *stretcher* is usually moved by two people, one at the head and the other at the feet.

appreciate

In accounting, *appreciation* of an asset is an increase in its value.

Those who *appreciate* fine wine will enjoy reading this restaurant's wine list.

ambulance

An *ambulance* is a vehicle for transportation of sick or injured people.

The London *Ambulance Service* is one of the largest *ambulance* services in the world.

supervise

Officers reduce the risk that people *on supervision* commit crimes.

In today's world, *supervisors* and their teams have more complex relationships than ever before.

intravenous

Injecting a drug *intravenously* means that more of the drug will reach the brain more quickly.

intravenous refers to giving medications or fluids through a needle or tube inserted into a vein.

blood transfusion

Blood transfusion is the process of receiving blood products into one's circulation intravenously.

Richard Lower performed the first successful blood transfusion, albeit on an animal, in 1666(!).

shock

Shock is a life-threatening condition occurring when the body is not getting enough blood flow.

Shock may result from dehydration, congestive heart failure, collapsed lung, heart attack, ...

X-rays

X-rays were first observed and documented in 1895 by Wilhelm Conrad Roentgen.

X-rays have a wavelength in the range of 0.01 to 10 nanometers.

conservative

Conservative treatment is a term describing the different types of non-surgical treatments.

Conservative treatment can be as simple as reassuring you that your problem is not so serious.

radical

Two important concepts in the treatment of malaria are suppressive and *radical* treatments.

Radical treatment is the treatment that aims to completely get rid of a cancer.

disability

A *disability* may be physical, cognitive, mental, sensory, emotional, developmental, ...

Disability is something most people do not like to even think about.

reassuring

reassure means to restore confidence to somebody.

Complex problems need a *reassuring voice*.

conservatism

The most central feature of *conservatism* is deference.

Conservatism is the inclination, especially in politics, to maintain the existing or traditional order.

hyperextension

A *hyperextension* is an exercise that works the lower back as well as the mid and upper back.

A *hyperextension* exercise is commonly called "superman" for the execution.

- **You should now give your own examples using:** *spine, spinal cord, move, motion, rolling, omit, omission, extent, extend, surgery.*

39 Monitoring disease activity in MS

Multiple sclerosis (MS) is a disabling disorder of the central nervous system. Inflammation, demyelination, and axonal degeneration are all characteristic pathologies, and they contribute directly to neurological deficits. Inflammation and demyelination can result in temporary deficits such as those occurring during relapses, but axonal degeneration is likely to result in a permanent loss of function and the slow accumulation of disability that characterizes the progressive phase of the disease.

Although there has been progress in the development of therapies for suppressing inflammatory white matter lesions, relapses, and relapse-associated disability, as yet there is no effective disease modifying treatment for progressive forms of MS. With the emergence of potential neuroprotective and reparative agents, it is hoped that therapies for progressive forms of MS will be identified. However, clinical trials in progressive MS that use disability scales as the primary outcome measure are large, expensive, and prolonged because of limited sensitivity of the scales that are currently used. Magnetic resonance imaging (MRI) is a useful tool for monitoring disease activity in MS, particularly in a clinical trial setting and may provide a reliable, sensitive and early marker of ongoing axonal loss, and, by implication, disease progression.

Recent studies comparing atrophy within cerebral grey and white matter compartments in MS have shown more marked and clinically relevant regional atrophy within the grey matter. In addition, a beneficial treatment effect of interferon on the rate of grey matter but not white matter atrophy has been demonstrated in a small cohort of patients with relapsing-remitting MS, suggesting that the grey matter volume is a potentially useful outcome measure in clinical trials. However, most studies of grey and white matter atrophy have investigated subjects with relatively early disease, and it is not known what the clinical relevance of atrophy within these compartments is later in the disease course. There are other studies which have focused on atrophy occurring within selected axial slices obtained through the cerebral hemispheres above the level of the third ventricle, and the rate of tissue loss may be greater in this region compared with the whole brain. In the cervical spinal cord, volume loss has been shown to be both measurable and correlated with disability in MS, particularly in primary progressive disease.

multiple sclerosis (MS)

Multiple sclerosis is also known as *disseminated sclerosis* or *encephalomyelitis disseminate*. *MS* may be an autoimmune disease, which happens when one's body attacks itself.

relapses

relapse (v.) means to fall or slide back into a former state.

Approx. 90% of alcoholics experience one *relapse* over the 4-year period following treatment.

suppressing

suppress means to put down by authority or force, to subdue.

suppression is psychiatry conscious exclusion of unacceptable desires, thoughts, memories,...

reparative agents

What is the effect of current anti-inflammatory *agents* on the *reparative* stage of inflammation?

To maintain healthy skin, we must apply *reparative agents* externally to the areas in need.

scales

Most fish have *scales* and breathe with gills.

Butterfly anatomy includes *scales*, which give the butterfly wings their color.

magnetic resonance imaging (MRI)

Magnetic resonance imaging (MRI) is used in detecting structural abnormalities of the body.

MRI scan uses powerful magnets and radio waves to create pictures of the body.

atrophy

Atrophy is the partial or complete wasting away of a part of the body.

In most people, muscle *atrophy* is caused by not using the muscles enough.

compartments

compartment is one of the parts or spaces into which an area is subdivided.

Compartment syndrome occurs when pressure within the muscles builds to dangerous levels.

cohort

She has a *cohort* of admirers.

cohort is a generational group as defined in demographics, statistics, or market research.

interferon

Interferons (*IFNs*) play an important role in the first line of defense against viral infections.

IFNs are proteins made and released by host cells in response to the presence of pathogens.

slices

slice is a thin, flat piece cut from something.

I watched the ship *slicing* the sea.

ventricle

The *ventricles* of the heart function to pump blood to the entire body.

The *ventricular* system is a set of structures containing cerebrospinal fluid in the brain.

volume

Volume is the quantity of three-dimensional space enclosed by some closed boundary.

To work out the *volume* of a cuboid, we need to know 3 measurements.

correlated

correlate means to bring into a mutual, complementary, or reciprocal relation.

I really cannot *correlate* these two pieces of information.

- **Your turn now! Give examples using:** *grey matter, white matter, disabling, deficits, accumulation, setting, marker, relevant, focused, measurable.*

40 The mysteries of the organism

Eric Kandel's interest in the mind is driven by two obsessive memories: the first, the humiliation of being thrown out of the family's Viennese apartment around the time of *Kristallnacht* when he was nine. The second, the disturbing eroticism of a furtive attempted seduction by Mitzi, the family's 25-year-old housekeeper, when he was eight. Shortly afterwards she ran off to Czechoslovakia with the gas repairman. For years, Kandel believed that running off to Czechoslovakia was the equivalent "of devoting one's life to the happy pursuit of sensuality". Kandel, however, devoted his life to understanding the physical basis of memory.

Transplanted to the US before the start of hostilities in Europe and educated at Harvard, he gravitated first towards psychoanalysis. He soon realised, however, that understanding the biological basis of memory would require simpler techniques than Freudian analysis. He opted to study single nerve cells in the giant marine snail *Aplysia*, a creature more than a foot in length and weighing several pounds. *Aplysia*, however, has only about 20,000 cells in its brain compared with 100 billion in mammals, some of which are so large they can be seen with the naked eye. They can easily be dissected, and their electrical characteristics measured. It was known that simple reflexes involve three nerve cells, one sensory, one intermediate and one to trigger a muscular response. The gaps between the nerve cells, the synapses, are bridged by chemicals called neurotransmitters. Kandel was able to show that short-term memory is the result of a strengthening in the connections between the cells: that is, more neurotransmitters are generated to bridge the synaptic gap. He was further able to show that genes have to be switched on to create long-term memories – the physical structure of the synaptic gap is changed as new connections are made. It was for these discoveries that Kandel, along with Arvid Carlsson and Paul Greengard, won the 2000 Nobel Prize in Physiology of Medicine.

In Search of Memory, the book explaining the emergence of a new science of mind, is popular science writing at its best. In it, Kandel explains his experiments, his arguments and his conclusions simply and logically. Mind, learning and memory used to be thought impossibly complex. Kandel and other neurobiologists have demonstrated they have their origins in essentially simple, physical processes. Their work gives hope that the final frontier, the nature of consciousness, will eventually yield up its secrets.

humiliation

Because of the powerlessness that it exposes, *humiliation* may lead to anxiety.

Shame is private, *humiliation* is public.

Humans have many ways to slight others and *humiliate* them.

eroticism

Eroticism is generally understood to refer to a state of sexual arousal or anticipation of such.

Eroticism is wholly dependent upon the viewer's culture and personal tastes.

furtive

furtive is something characterized by stealth, something sly and secretive.

At that moment we exchanged *furtive* smiles across the table.

furtively (adv.) describes the movements or behavior of someone who's being sneaky or sly.

seduction

The thrill of *seduction* sometimes lies in the chase rather than the conquest.

It is very important that you choose the right person to *seduce*, of course.

A smile is a simple but crucial *seduction* technique.

pursuit

pursuit is an activity that one engages in as a vocation, profession, occupation.

pursuit of something is an effort to secure or attain; a quest.

sensuality

Sensuality is, in essence, how in tune you are with your senses.

How sensual you are plays a key role in your overall ability to derive pleasure from life.

devoted

A *devoted* friend is a one feeling or displaying strong affection or attachment.

I *devoted* this afternoon to repainting my study, and nothing will get in my way.

The *devotion* of his wealth and time to scientific advancement is well known.

hostilities

Hostility (also called *inimicality*) is a form of angry internal rejection or denial in psychology.

hostilities is the term referring to war and acts of warfare.

gravitated

Gravity is a natural force by which bodies attract with a force proportional to their mass.

Gravitation is responsible for keeping the Moon in its orbit around the Earth.

marine snail

Sea snails produce seashells which are coiled in the adult stage.

The marine shelled species of gastropod include numerous *sea snails*.

bridged

In a *bridged* network, no correspondence is required between addresses and paths.

The dentist pulled out the decayed tooth and put in a *bridge*.

search

In order *to search* a database, you must connect and follow its specific directions.

to search means to look over carefully in order to find something.

frontier

A *frontier* is a political and geographical term referring to areas near or beyond a boundary.

In the EU, *frontier* describes the region beyond the expanding borders of the European Union.

- **Try to give examples of your own, using:** *repair, repairman, memory, pound, pounds, naked, yield, yield up.*

41 Not a problem – for the mother

– Now listen very carefully. A baby’s blood is always quite separate from the mother’s. Nevertheless, in pregnancy, small amounts of the baby’s blood often escape into the mother’s blood stream. If the mother is Rh negative and the baby happens to be Rh positive, sometimes that can mean our old friend ‘big D’ seeps into the mother’s blood stream, and he isn’t welcome there. When that happens, the mother’s blood usually creates something we call antibodies, and those antibodies fight the ‘big D’ and eventually destroy it.

Elizabeth was puzzled. – Then where’s the problem?

– There never is any problem – for the mother. The problem, if there is one, begins when the antibodies, the ‘big D’ fighters which the mother has created, cross over the placental barrier into the baby’s blood stream. You see, although there’s no regular movement of blood between mother and baby, the antibodies can, and do, cross over quite freely.

– And you mean the antibodies would start fighting with the baby’s blood, and destroying it. – She had it now clearly in her mind.

Dornberger looked at her admiringly. This is one smart girl, he thought. She hadn’t missed a thing. Aloud he said – The antibodies might destroy the baby’s blood, or part of it, if we let them. That’s a condition we call *Erythroblastosis Foetalis*.

– But how do you stop it happening?

– If it happens we can’t stop it. But we can combat it. In the first place, as soon as there are any antibodies in the mother’s blood we get a warning through a blood-sensitization test. That test will be done on your blood, now and later during your pregnancy.

– How is it done? – Elizabeth asked.

– You’re quite a girl with the questions. – The obstetrician smiled. – I couldn’t tell you the lab procedure. Your husband will know more about that than I do.

– But what else is done? For the baby, I mean.

He said patiently – The most important thing is to give the baby an exchange transfusion of the right kind of blood immediately after birth. It’s usually successful. – He deliberately avoided mention of the strong danger of an erythroblastotic child being born dead or that physicians often induced labor several weeks early to give the child a better chance of life. In any case he felt the discussion had gone far enough.

pregnancy

Mums-to-be should learn what to expect during the three phases (trimesters) of *pregnancy*. It is good to know about weight gain, nutrition, what's safe during *pregnancy* and what's not, etc.

escape

Escapism is mental diversion by means of entertainment or recreation.

Escapology is the practice of escaping from restraints or other traps.

Rh negative, Rh positive

About 85 percent of Caucasians are *Rh-positive*, as are 98 to 99 percent of Asian Americans.

If a mother is Rh-negative, there's a chance that her blood is incompatible with her baby's blood.

seeps

seep means to pass slowly through small openings or pores; to ooze.

A *seep* is a moist or wet place where water, usually groundwater, reaches the earth's surface.

antibodies

Each *antibody* binds to a specific antigen – an interaction similar to a lock and key.

Antibodies are immune system-related proteins called immunoglobulins.

placental

The *placenta* is an organ that connects the developing fetus to the uterine wall.

Placental abruption is the separation of the *placenta* from the uterine lining.

Erythroblastosis Foetalis

Erythroblastosis Foetalis is a haemolytic disease of a newborn.

Generally recognized are three types of *erythroblastosis foetalis*.

erythroblastotic

The anemia of *erythroblastotic* infants can be predicted antenatally by the indirect Coombs test.

Erythroblastotic newborns can suffer from jaundice, and brain damage if untreated.

combat

combat is a purposeful violent conflict meant to establish dominance over the opposition.

The term *combat* typically refers to armed conflict between military forces in warfare.

blood sensitization

In first pregnancies, Rh *sensitization* is rarely a problem.

When the mother's blood and the baby's blood match, *sensitization* will not occur.

obstetrician

An *obstetrician* closely monitors their patient's health during pregnancy and delivery.

An *obstetrician* is commonly called an OB/GYN.

transfusion

Blood *transfusion* is the process of receiving blood products into one's circulation intravenously.

Early transfusions used whole blood, modern practice uses only components of the blood.

induce

induce means to lead or move, as to a course of action, by influence or persuasion.

Opium *induces* sleep.

induce labor

Labor *induction* is a method of artificially or prematurely stimulating childbirth in a woman.

Can *labor* and childbirth be *induced* a natural way?

- **Your turn now! Make some examples using:** *pregnant, placenta, foetus, blood stream, barrier, sensitize, sensitive, laboratory, lab, induction, chance, discussion.*

42 Not bigger than a fist!

The human heart has a mass of between 250 and 350 grams and is about the size of a fist. It is enclosed in a double-walled protective sac called the pericardium. The double membrane of pericardium consists of the pericardial fluid which nourishes the heart and prevents heart from shocks. The superficial part of this sac is called the fibrous pericardium. The fibrous pericardial sac is itself lined with the outer layer of the serous pericardium (known as the parietal pericardium). This composite (fibrous-parietal-pericardial) sac protects the heart, anchors its surrounding structures, and prevents overfilling of the heart with blood. The inner layer also provides a smooth lubricated sliding surface within which the heart organ can move in response to its own contractions and to movement of adjacent structures such as the diaphragm and lungs. The outer wall of the human heart is composed of three layers. The outer layer is called the epicardium, or visceral pericardium since it is also the inner wall of the (serous) pericardium. The middle layer is called the myocardium and is composed of muscle which contracts. The inner layer is called the endocardium and is in contact with the blood that the heart pumps. Also, it merges with the inner lining (endothelium) of blood vessels and covers heart valves.

The human heart has four chambers, two superior atria and two inferior ventricles. The atria are the receiving chambers and the ventricles are the discharging chambers.

The pathways of blood through the human heart is part of the pulmonary and systemic circuits. These pathways include the tricuspid valve, the mitral valve, the aortic valve, and the pulmonary valve. The mitral and tricuspid valves are classified as the atrioventricular (AV) valves. This is because they are found between the atria and ventricles. The aortic and pulmonary semi-lunar valves separate the left and right ventricle from the pulmonary artery and the aorta respectively. These valves are attached to the chordae tendinae (literally the heartstrings), which anchors the valves to the papilla muscles of the heart.

The interatrioventricular septum, a thick wall of muscle, separates the left atrium and ventricle from the right atrium and ventricle, dividing the heart into two functionally separate and anatomically distinct units. Normally with each beat the right ventricle pumps the same amount of blood into the lungs that the left ventricle pumps out into the body. Physicians commonly refer to the right atrium and right ventricle together as the right heart and to the left atrium and ventricle as the left heart.

pericardium

Pericardium is a double-walled sac that contains the heart and the roots of the great vessels. There are two layers to the pericardial sac: the fibrous pericardium and the serous pericardium.

serous

The serous pericardium, in turn, is divided into two layers.

The term *serous fluid* is used for various bodily fluids, typically pale yellow and transparent.

parietal

The *parietal lobe* is a part of the brain above the occipital lobe and behind the frontal lobe.

The *parietal pleura* is the portion of the pleura external to the pulmonary pleura.

epicardium

Epicardium is the inner layer of the pericardium, a conical sac of fibrous tissue.

Epicardium describes the outer layer of heart tissue (from Greek *epi-* outer, *cardium* heart).

visceral pericardium

Visceral pericardium is the innermost of the two layers of the pericardium.

The pericardial cavity lies between the *visceral pericardium* and the parietal pericardium.

myocardium

Myocardium is the muscular tissue of the heart.

Myocardium is the middle and thickest layer of the heart wall.

endocardium

The *endocardium* is the innermost layer of tissue that lines the chambers of the heart.

Endocardium is the thin endothelial membrane lining the cavities of the heart.

endothelium

The *endothelium* is the thin layer of cells that lines the interior surface of blood vessels.

Endothelial cells are the key to atherosclerosis.

atria

atria refers to: atrium (heart) (plural: *atria*), an anatomical structure of the heart.

In anatomy, the *atrium* (plural: *atria*) is sometimes called *auricle*.

ventricles

The *ventricles* of the heart function to pump blood to the entire body.

Right *ventricle* receives blood from the right atrium and pumps it to the main pulmonary artery.

tricuspid valve

The *tricuspid valve* is the right atrioventricular valve.

The normal tricuspid valve usually has three leaflets and three papillary muscles.

mitral valve

The *mitral valve* is also known as the *bicuspid valve* or *left atrioventricular valve*.

Mitral valve repair is the surgical treatment of choice for mitral regurgitation.

aortic valve

The *aortic valve*, one of the valves of the heart, is normally tricuspid (with three leaflets).

It is important to diagnose and treat diseases of the *aortic valve*.

papilla

The term *papilla* (plural: *papillae*) generally means a nipple-like structure.

The *renal papilla* is the location where the medullary pyramids empty urine into the minor calyx.

septum

The *nasal septum* is the wall dividing the nasal cavity into halves.

Nasal septum deviation is a common physical disorder of the nose.

- **In sentences of your own, illustrate the meanings of:** *enclosed, sac, adjacent, membrane, composite, smooth, lubricated, contractions, valves, chambers, superior, inferior, discharging, diaphragm.*

43 Peptic ulceration

Peptic ulcers occur solely in those parts of the alimentary canal which are exposed to the action of hydrochloric acid. They are usually confined to the segment which lies between the cardiac orifice of the stomach and the bile papilla in the duodenum, but they may also be found in abnormal situations to which the acid has gained access. The presence of hydrochloric acid in the stomach is a prerequisite of ulceration but not its cause. Hyperchlorhydria is followed so seldom by ulceration that another explanation must be sought.

In their clinical characters duodenal and gastric ulcers are as different as are measles and mumps. Thus duodenal ulcer is becoming more frequent. A factor in the aetiology of duodenal ulcer which appears in every clinical analysis is a psychological one; a perfectly happy man, however unsuitable his diet may be, never suffers from it. The duodenal type occurs oftener in males; they are usually intellectual, ambitious, and of a worrying nature. Anxiety and excessive smoking of cigarettes seem to be the chief causes of its onset and relapse, with exposure to cold, irregular meals and overwork as secondary factors. Duodenal ulcer is associated with a high and small stomach set transversely and emptying rapidly, and with a steep curve of acid production. If the cause of the patient's anxiety can be removed and smoking is abandoned, a duodenal ulcer responds well to treatment; it remains healed as long as the causative factors do not recur.

There are no such clearly linked primary causes of gastric ulcer as those which have been noted for duodenal ulcer, but in some patients oral sepsis and malnutrition seem to be partly responsible. Gastric ulcer occurs with much the same frequency in both sexes, and is commonly seen in the feeble, the listless, and in persons who are in poor general health. It is associated with a low and long stomach emptying slowly and, as a rule, with hypochlorhydria. Gastric ulcers at an early stage respond to treatment as favourably as duodenal ulcers, but at a later stage they tend to become refractory.

As to the prognosis, duodenal ulcers offer a better chance of cure than gastric ulcers but cause more deaths owing to perforation or haemorrhage. Gastric ulcers are less dangerous than duodenal ulcers, since perforation and severe haemorrhages are rare. Although patients with gastric ulcer seldom die from these complications they are liable to sink into a state of chronic invalidism which makes an operation advisable. Duodenal ulcers never become malignant, whereas the incidence of malignancy in gastric ulcer is from 2 to 5 per cent of the cases.

peptic

A peptic ulcer is an ulcer in the lining of the stomach, duodenum, or esophagus. Peptic ulcer disease can have symptoms that mimic colorectal cancer.

ulcers, ulceration

ulceration refers to the process or fact of being eroded away, as by an ulcer.

aphthous ulcer is a small sensitive painful ulcer crater in the lining of the mouth.

alimentary canal

alimentary is everything concerning food, nourishment, and the organs of digestion.

alimentary canal is the *digestive tract* and, perhaps most often in conversation, the *GI tract*.

cardiac orifice

cardiac orifice is the opening by which the *esophagus* communicates with the *stomach*.

The stomach has two *orifices*, two curvatures and two surfaces.

bile

Bile is a yellow-green fluid that is made by the liver and stored in the gallbladder.

Bile acid is an acid made by the liver that works with *bile* to break down fats.

papilla

papilla is a small nipple-like projection, such as a protuberance on the skin.

In pancreas divisum, the ventral duct drains into the major *papilla*.

duodenum

The *duodenum* is the first section of the small intestine in most higher vertebrates.

A *duodenal ulcer* is usually caused by an infection with a bacterium (germ) called *H. pylori*.

hydrochloric acid

Hydrochloric acid is a solution of hydrogen chloride (HCl) in water.

Hydrochloric acid is a strong mineral acid with many uses in industry.

hyperchlorhydria

Hyperchlorhydria is the state where gastric acid levels are higher than the normal range.

Hyperchlorhydria is a gastric maladaptive response to the changes in gastric ecology.

hypochlorhydria

hypochlorhydria refers to a deficiency in hydrochloric acid produced by the stomach.

Hypochlorhydria can also be a possible cause of *bad breath*.

sepsis

sepsis refers to a condition in which body is fighting a severe infection.

Sepsis is in fact *blood poisoning*, which can be a deadly infection.

listless

listless refers to having no interest in what is going on about one.

After that defeat they felt tired, rundown, *listless*.

incidence

incidence is the number of new cases of a condition that develop during a specific time period.

Incidence shows the likelihood that a person in a population will be affected by a condition.

haemorrhage

haemorrhage/hemorrhage can refer to profuse bleeding from ruptured blood vessels.

Splinter *hemorrhages* look like thin, red to reddish-brown lines of blood under the nails.

- **Your turn now! Make examples using:** *prerequisite, confined, abnormal, malnutrition, refractory, prognosis, severe, sink, perforation, oral, feeble, invalidism.*

44 A period of improved cleanliness

The Black Death, on its first visitation of Europe from some mysterious fountain-head of disease in the undiscovered East, swept off perhaps a third, possibly a half, of the compatriots of Boccaccio, Froissart, and Chaucer. The most terrible feature of its first advent was its ubiquity. In the most secluded English hamlets we often read, in the list of vicars in the parish church, the names of *two* incumbents under that fatal year. Some villages and hamlets ceased to exist, the whole population having died. In the winter of 1349 the plague was stayed, but it remained in the island, and was perpetually breaking out in one insanitary township after another. Its last appearance, as Charles II's 'Plague of London', seems to have been little, if at all, worse than several plagues that had devastated the capital in Lancastrian, Tudor, and Stuart times, with no Defoe to celebrate them. Plague was a black cloud, ever hovering over the filthy streets and brief lives of our ancestors. It was a frequent sequel to the famine of a bad harvest year.

The unexampled rise in population from 1760 onwards was due, not so much to earlier marriages and an increase in the crude birthrate, though these had a considerable part in the affair before 1790, as to the saving of life by improvements in medical science and practice, and to an improved standard of living which may to some extent be attributed to cheap goods produced by the new mechanical inventions. The disappearance of the Plague so long endemic in the island; the control of the ravages of scurvy and ultimately of small-pox; the reduction of ague and fever by the draining of the land; the advance of habits of cleanliness and the use of cheap cotton shirts; improvements in sanitation in London and elsewhere as compared to the past, however appalling the age of Howard appears to our nice senses to-day; and above all else, more and better hospitals and better medical care of mothers and infants which greatly reduced mortality at child-birth or by 'convulsions', rickets, and other infantile diseases – all these were features of the Eighteenth and early Nineteenth Centuries.

It is not impossible that until the very eve of the Twentieth Century the crude birth-rate has varied very little down the ages, and that the modern increase of population was due to the more successful efforts of society 'officially to keep alive'. At the end of George III's reign the French death-rate was twenty per cent higher than the English. With all its faults, the later Eighteenth Century in England was a period of improved science, cleanliness, and humanity.

compatriots

“Arise, O *Compatriots*” is the national anthem of the Federal Republic of Nigeria. We are eager to watch our *compatriots* competing in the Olympics.

advent

The word *advent* derives from the Latin word meaning *coming*. The Eastern churches’ equivalent of *Advent* is called the *Nativity Fast*.

ubiquity

Ubiquity is a synonym for omnipresence, the property of being present everywhere. *Propionibacterium acnes* is a *ubiquitous* skin-dwelling organism involved in causing acne.

incumbents

The *incumbent*, in politics, is the existing holder of a political office. *incumbens* in Medieval Latin meant *holder of a church position*.

insanitary

insanitary refers to, or pertains to, a lack of sanitation; sth. dirty, unhealthy. Territorial authorities are responsible for dangerous and *insanitary* buildings.

hovering

Hovering is the process by which an object is suspended by a physical force against gravity.

sequel

A *sequel* is a narrative, or other work of literature, film, theatre, music that continues the story. A *sequel* can lead to a *series*, in which key elements appear in a number of stories.

famine

A *famine* is a widespread scarcity of food, caused by crop failure, overpopulation, etc. *Famine* is the result of a process of “free market” restructuring of the global economy.

endemic

endemic may refer to *endemism*, the state of being unique to a defined geographic location. Chickenpox is *endemic* (steady state) in the UK, but malaria is not.

ravages

A month ago a tornado *ravaged* that little town. The *ravage*, the old age, the death of everything in nature reminds us that we are perishable.

scurvy

Scurvy is a disease that occurs when one has a severe lack of vitamin C (ascorbic acid). The name *scurvy* comes from the Latin *scorbutus*.

small-pox

Smallpox was an infectious disease unique to humans, caused by *Variola major/Variola minor*. *Smallpox* was once found throughout the world, causing illness and death wherever it occurred.

ague

Ague is a febrile condition in which there are alternating periods of chills, fever, and sweating. Among the many names for malaria are *ague*, jungle fever, marsh/swamp fever, and paludism.

convulsions

Convulsion is an abnormal, involuntary contraction of the muscles. Epilepsy is best known for causing *convulsions*.

rickets

Rickets is caused by a deficiency of vitamin D, calcium or phosphate. *Rickets* has declined in frequency but it is still a problem.

- **Can you give your own examples to illustrate the meanings of:** *visitation, cleanliness, fountain-head, secluded, hamlets, township, vicars, parish, perpetually, devastated, filthy, birthrate, unexampled, sanitation, appalling, eve, infantile?*

45 Reactions to being informed about HPV

Public understanding about HPV has lagged behind the scientific and technical advances. Because HPV testing has significant social and psychological consequences, there is an urgent need for health education. When women are tested for HPV, they want information and guidance both from their health care providers and through open sources. HPV information is complex, and many women remain confused after having read educational materials. Ensuring that HPV information is accessible to people at all levels of health literacy will be important. This should address many of the psychosocial issues posed by HPV testing and help ensure that women benefit from the scientific advances that will ultimately contribute to world-wide control of cervical cancer.

Qualitative studies with women from a range of backgrounds have explored reactions to receiving information about HPV. The information typically includes the name of the virus, the mode of transmission, the prevalence of transient infection and the associations with cervical abnormalities and cervical cancer. Most women are astonished by the information and many are shocked that they didn't know about it before. All the qualitative studies in the field find that women want more information about HPV. Women want their health providers to be well-informed about the disease in order to answer their questions without giving confusing and inconsistent information. Health professionals' knowledge of HPV has not received much attention, but the experience of women with positive test results suggests that many have limited knowledge about HPV. Education of health professionals should be a priority.

Women's reactions to hearing about the test include confusion and anxiety about the association with sexually transmissible infections (STIs) as well as issues of fidelity and trust in relationships. Identified was confusion about the relationship between Pap testing and HPV DNA testing, and uncertainty about the level of risk. Women from some ethnic and religious backgrounds express fears that community leaders could be less supportive of cervical screening if they were aware of the link with sexual transmission. The association between HPV and genital warts can compound women's worry about infection if warts already carry negative connotations. Most women outside of stable relationships express the wish to know their HPV status, expressing at the same time concern about preventing infection in the future, either for themselves or for their partners.

lag behind

lag behind means to move or develop slowly, as toward a goal or objective.
Trees *lag behind* climate change.

advances

A cash *advance* is a service provided by most credit card and charge card issuers.
Have you read about the *advances* in genetic engineering recently?

accessible

An *accessible* and genial man is a one easy to get along with or talk to.
Books are so inexpensive and *accessible* to all today!

literacy

Literacy refers to the ability to read for knowledge and write coherently.
Literacy represents the lifelong, intellectual process of gaining meaning from print.

ultimately

Is Life on Earth *ultimately* self-destructive?
Ultimately, we will have to make a decision before the end of the week.

transmission

A machine consists of a power source and a power *transmission* system.
transmission is the act of passing something on in another place.

confusing

We must admit that the term “intellectual property” is rather biased and *confusing*.
Confusion and inability to focus attention are the symptoms of a loss of normal brain function.

anxiety

Anxiety is a normal reaction to stress.
Anxiety helps one study harder for an exam, keep focused on an important speech, etc.

transmissible

Transmissible signals are those that can be transmitted.
Transmissible spongiform encephalopathies (TSEs) are also known as prion diseases.

fidelity

Fidelity is the quality of being faithful or loyal.
The original meaning of *fidelity* regarded duty to a lord or a king.

warts

Warts are small, rough lumps on the skin that are benign (non-cancerous).
Genital *warts*, common *warts*, facial *warts* are caused by the human papillomavirus.

compound

Chemical *compounds* are combinations of two or more elements.
Chances are everything we can see is one type of *compound* or another.

connotations

Connotations are the emotional implications and associations that a word may carry.
Connotations are not purely ‘personal’ meanings.

- **What do the abbreviations HPV, STIs, DNA stand for? Give some examples/sentences using: urgent, guidance, providers, ensure, posed, mode, astonished, status, concern.**

46 **A required activity, not an option**

Sleep is a behavioral state that is a natural part of every individual's life. We spend about one-third of our lives asleep. Nonetheless, people generally know little about the importance of this essential activity. Sleep is not just something to fill time when a person is inactive. Sleep is a required activity, not an option. Even though the precise functions of sleep remain a mystery, sleep is important for normal motor and cognitive function. We all recognize and feel the need to sleep. After sleeping, we recognize changes that have occurred, as we feel rested and more alert. Sleep actually appears to be required for survival. Rats deprived of sleep will die within two to three weeks, a time frame similar to death due to starvation.

It is not normal for a person to be sleepy at times when he or she expects to be awake. Problem sleepiness may be associated with difficulty concentrating, memory lapses, loss of energy, fatigue, lethargy, and emotional instability. The prevalence of problem sleepiness is high and has serious consequences, such as drowsy driving or workplace accidents and errors. Lifestyle factors and undiagnosed or untreated sleep disorders can cause problem sleepiness. Lifestyle factors include not getting enough sleep, having an irregular sleep schedule, and using alcohol or certain medications. Of the more than 70 known sleep disorders, the most common are obstructive sleep apnea, insomnia, narcolepsy, and restless legs syndrome. Large numbers of individuals suffering from these sleep disorders are unaware of – and have not been diagnosed or treated for – their disorder.

Problem sleepiness can be deadly. Approximately 100,000 automobile crashes each year result from drivers who were “asleep at the wheel.” In a survey of drivers in New York State, approximately 25 percent reported they had fallen asleep at the wheel at some time. Crashes in which the driver falls asleep are especially common among young male drivers. One large study found that in over 50 percent of fall-asleep crashes, the driver was 25 years old or younger. In addition to the high risk of automobile crashes, problem sleepiness can cause difficulties with learning, memory, thinking, and feelings, which may lead to poor school and work performance and difficulty with relationships. Furthermore, problem sleepiness leads to errors and accidents in the workplace.

behavioral

Behavior/behaviour provides outputs from the organism to the environment.
Behaviorism insisted on working only with what can be seen or manipulated.

rested

We should all learn tips on how to stay well rested and alert.
Older adults spend less time in the more restorative stages of sleep.

alert

He was tired and had trouble staying alert while he was driving.
The candidate was not mentally alert enough to answer the questions.

survival

The refugees depend on foreign aid for their survival.
Small businesses are fighting for survival.

deprived

You can eat small amounts of your favorite foods, so you won't feel deprived.
Deprived of the means of his livelihood, he sat down on the bank and lamented his hard fate.

starvation

Starvation is a severe deficiency in caloric energy, nutrient and vitamin intake.
He has witnessed the deaths of old and young, and even infants, from sheer starvation.

fatigue

Weakness and fatigue in fact describe two different sensations.
Fatigue may be due to medical causes, lifestyle or emotional concerns or stress.

lethargy

Fatigue is also called exhaustion, *lethargy*, languidness, languor, lassitude, listlessness.
Lethargy can be a normal response to inadequate sleep, overexertion, overworking, stress, ...

prevalence

Prevalence refers to the proportion of individuals in a population having a disease.
Cancer prevalence refers to the total number of people living with cancer at any point in time.

drowsy

drowsiness refers to feeling abnormally sleepy during the day.
How can one possibly avoid feeling drowsy after lunch?!

apnea

Sleep apnea is a disorder characterized by a reduction or pause of breathing during sleep.
Mild sleep apnea is usually treated by some behavioral changes.

insomnia

Insomnia is most often defined by an individual's report of sleeping difficulties.
Most adults have experienced insomnia or sleeplessness at one time or another in their lives.

narcolepsy

Narcolepsy is a neurological disorder that affects the control of sleep and wakefulness.
Narcolepsy (dyssomnia) is characterized by an excessive urge to sleep at inappropriate times.

memory

memory is an organism's ability to store, retain, and recall information and experiences.
Traditional studies of memory began in the fields of philosophy.

- **Make sentences of your own using:** *sleep, sleepy, sleepiness, asleep, awake, inactive, mystery, cognitive, irregular, schedule, performance, relationships.*

47 **Running in the family**

There is substantial evidence that suicidal behaviour is transmitted within families. This association is found across a range of psychiatric disorders and appears to be additional to that caused by familial transmission of the disorders themselves. Evidence that the mode of familial transmission is related, at least in part, to genetic factors has received support from twin studies where the concordance for suicidal behaviour between twin pairs is greater in monozygotic than dizygotic twins. Results of a Danish non-twin adoption study, in which suicidal behaviour in adoptees, adopting relatives and biological relatives was examined, suggested that the genetic predisposition for suicidal behaviour is independent of, and/or additive to, the genetic predisposition for major psychiatric disorder. In a further investigation from this study of adoptees with a history of affective disorder, the strength of the association between suicidal behaviour in adoptees and biological relatives was greatest in patients with suicidal behaviour in the context of an affective disorder associated with a situational crisis. As suicidal behaviour in these circumstances is often impulsive, it has been suggested that the genetic predisposition may be related to an inability to control responses. Post-mortem cerebrospinal fluid and twin studies suggest that the most likely biological basis for the genetic contribution to suicidal behaviour is reduced activity within the serotonin transporter systems. This system is thought to be important in the control of both aggression and impulsivity. It is perhaps of relevance therefore that familial transmission of suicidal behaviour may be particularly associated with violent suicide attempts. Family history of aggressive behaviour is common in children who engage in suicidal behavior. Also, among both adolescent suicides and suicide attempters those with a history of aggression are more likely to have a family history of suicidal behavior.

Little attention has been paid to the implications of a family history of suicidal behaviour in those who have already carried out an act of suicidal behaviour. Such information may have relevance not only to increasing the understanding of the aetiology of suicidal behaviour but also to treatment. This is why it is important to determine the prevalence of a family history of suicidal behaviour and to investigate whether there are differences between those with and those without a positive family history in terms of the nature of their deliberate self-harm (DSH), repetition of the behaviour, prevalence of psychiatric disorders, and their psychological characteristics, including aggression and impulsivity.

twin

A *twin* is one of two offspring produced in the same pregnancy.

The world's highest rates of twinning are found across Central Africa.

Siamese twins are identical (monozygotic) *twins* that did not separate fully from one another.

monozygotic twins

In common parlance, *monozygotic twins* are the twins that are “identical”.

Monozygotic twins originate from the same fertilized ovum, and thus the same sperm.

dizygotic twins

Dizygotic means “two eggs” – the twins develop side by side in the womb.

The more common *dizygotic* twins begin as two eggs separately fertilized by two sperm.

concordance

Concordance relates to the presence of the same trait in both members of a pair of twins.

Concordance correlation coefficient is a measurement of the agreement between two variables.

adoptees

Searching for birth parents might seem daunting to an *adoptee*.

Late discovery *adoptees*, LDAs, are those who learned of their adoptions at older ages.

affective disorder

Seasonal affective disorder, *SAD*, is also known as *winter/summer depression/blues*.

SAD is a form of depression that tends to occur as the days grow shorter in the fall and winter.

Bipolar affective disorder is also known as *manic depression* or *bipolar depression*.

suicidal behavior

Suicidal behavior is any action that could cause a person to die, e.g. taking a drug overdose.

Suicide and suicidal behaviors usually occur in people with depression or schizophrenia.

post-mortem

An *autopsy* is also known as a *post-mortem examination*.

Post-mortem examinations are performed by specialized medical doctors called *pathologists*.

serotonin

Serotonin or 5-hydroxytryptamine, 5-HT, is a monoamine neurotransmitter.

An imbalance in *serotonin* levels may influence mood in a way that leads to *depression*.

impulsivity

Impulsivity can lead to impulsive and often inappropriate social behaviour.

Impulsivity is among the characteristics of Attention Deficit Hyperactivity Disorder (ADHD).

implications

Logical implication is entailment, or consequence, a relation between statements.

implication is sth. not expressed; an inference, or something which may fairly be understood.

aetiology

aetiology/etiology (in medicine) is the science that deals with the causes or origin of disease.

When we hear that “the aetiology is unknown”, this means that we do not know the cause.

deliberate self-harm

Deliberate self-harm is a troubling aspect of adolescence that appears to be on the increase.

Deliberate self-harm is also known as *self-injury*.

- **Can you give your own definitions/explanations of:** *substantial, familial, adoption, predisposition, crisis, impulsive, post-mortem, aggression, impulsivity, adolescent, attempters, suicide attempts?*

48 The Shock Shop

“In there? You haven’t had the pleasure. Pity. An experience no human should be without.” Harding laces his fingers behind his neck and leans back to look at the door. “That’s the Shock Shop I was telling you about some time back, my friend, the EST, Electro-Shock Therapy. Those fortunate souls in there are being given a free trip to the moon. No, on second thought, it isn’t completely free. You pay for the service with brain cells instead of money, and everyone has simply billions of brain cells on deposit.” He frowns at the one lone man left on the bench. “Not a very large clientele today, it seems, nothing like the crowds of yesteryear. But then, *c’est la vie*, fads come and go... Our dear head nurse is one of the few with the heart to stand up for a grand old tradition in the treatment of the rejects of sanity: Brain Burning.”

“What they do is” – McMurphy listens a moment – “tab some bird in there and shoot electricity through his skull? What the hell for?”

“Why, the patient’s good, of course. Everything done here is for the patient’s good. EST isn’t always used for punitive measures, as our nurse uses it, and it isn’t pure sadism on the staff’s part, either. A number of supposed Irrecoverables were brought back into contact with shock, just as a number were helped with lobotomy and leucotomy. Shock treatment has some advantages; it’s cheap, quick, entirely painless. It simply induces a seizure.”

“What a life,” Sefelt moans. “Give some of us pills to stop a fit, give the rest shock to start one.”

Harding leans forward to explain it to McMurphy. “Here’s how it came about... It was known that men coming out of an epileptic convulsion were inclined to be calmer and more peaceful for a time, and that violent cases completely out of contact were able to carry on rational conversations after a convulsion. No one knew why; they still don’t. But it was obvious that if a seizure could be induced in non-epileptics, great benefits might result. And here, before them, stood a man inducing seizures every so often with remarkable aplomb.”

McMurphy shakes his head. “Hoo-wee! Electricity through the head. And you say it don’t hurt?”

“I personally guarantee it. Completely painless. One flash and you’re unconscious immediately. No gas, no needle, no sledgehammer. Absolutely painless. The thing is, no one ever wants another one. You ... change. You forget things.”

shock

Circulatory shock is commonly known simply as *shock*.

There are several types of medical *shock*, septic shock, anaphylactic shock, etc.

Electro-Shock Therapy – EST

Electroconvulsive therapy (ECT) was formerly known as *electroshock*.

Electroshock therapy is used for treatment of depression and manic depression.

frown

A *frown* (a *scowl*) is a facial expression in which the eyebrows are brought together.

to frown often means to regard something with disapproval or distaste.

fad

A *fad* is any form of behavior that develops among a large population, for some period.

Some *fads* from the past are hula hoops, disco dancing, flagpole sitting, Rubik's Cubes,...

tab

tab is a flap, or short strip attached to an object to facilitate opening, handling, or identification.

Today, *TAB* often means an acronym, an abbreviation, or a slang word.

irrecoverable, irrecoverables

irrecoverable is anything that is incapable of being recovered.

irrecoverable is everything that is incapable of being recovered or regained.

lobotomy

Lobotomy is a neurosurgical procedure, a form of psychosurgery, also known as a *leucotomy*.

Lobotomies first came to public notice because of *One Flew Over the Cuckoo's Nest*.

leucotomy

A *leucotomy* basically involved drilling holes in the skull in order to access the brain.

Prefrontal leucotomy was used as a treatment for disorders involving obsessive agitation.

seizure

Seizures happen because of sudden, abnormal electrical activity in the brain.

There are different types of *seizures* – grand mal, absence, myoclonic, clonic, tonic, etc.

moan

A low, sustained, mournful cry, usually indicative of sorrow or pain.

Moaning is a way of communicating or expressing excitement and pleasure.

fit

a *hissy fit* is a sudden outburst of temper, often describing female anger at something trivial.

A *fit*, a *tantrum* is an emotional outburst, associated with children or those in emotional distress.

convulsion

A *convulsion* is a condition where body muscles contract and relax rapidly and repeatedly.

Febrile *convulsions* occur in children when there is a rapid increase in their body temperature.

epileptic convulsion

Certainly *epilepsy* is a *convulsion* of all parts of the body.

What is the First aid treatment for *epileptic convulsion*?

aplomb

In classical ballet, *aplomb* refers to the basic law of ballet - stability.

I didn't like the trend the conversation was taking, but I preserved my *aplomb*.

- **Try to give your own examples using:** *deposit, on deposit, client, clientele, punish, punitive, sadist, sadism, rational, irrational, painless, flash, sledgehammer.*

49 Sleep is a dynamic process

Scientists study sleep by measuring the electrical changes in the brain using electroencephalograms (EEGs). Typically, electrodes are placed on the scalp in a symmetrical pattern. They measure very small voltages that scientists think are caused by synchronized activity in very large numbers of synapses (nerve connections) in the brain's outer layers (cerebral cortex). EEG data are represented by curves that are classified according to their frequencies. The wavy lines of the EEG are called brain waves. An electrooculogram (EOG) uses electrodes on the skin near the eye to measure changes in voltage as the eye rotates in its socket. Scientists also measure the electrical activity associated with active muscles by using electromyograms (EMGs). In this technique, in humans the electrodes are placed under the chin because muscles in this area demonstrate very dramatic changes during the various stages of sleep. In practice, EEGs, EOGs, and EMGs are recorded simultaneously on continuously moving chart paper or digitized by a computer and displayed on a high-resolution monitor. This allows the relationships among the three measurements to be seen immediately. The patterns of activity in these three systems provide the basis for classifying the different types of sleep. Studying these events has led to the identification of two basic stages, or states, of sleep: non-rapid eye movement (NREM) and rapid eye movement (REM).

The EEG, EMG, and EOG patterns change in predictable ways several times during a single sleep period. NREM sleep is divided into four stages according to the amplitude and frequency of brain wave activity. In general, the EEG pattern of NREM sleep is slower, often more regular, and usually of higher voltage than that of wakefulness. As sleep gets deeper, the brain waves get slower and have greater amplitude. NREM Stage 1 is very light sleep; NREM Stage 2 has special brain waves called sleep spindles and K complexes; NREM Stages 3 and 4 show increasingly more high-voltage slow waves. REM sleep is characterized by bursts of rapid eye movements. The eyes are not constantly moving, but they dart back and forth or up and down. They also stop for a while and then jerk back and forth again. Always, and just like waking eye movements, both eyes move together in the same direction. Some scientists believe that the eye movements of REM sleep relate to the visual images of dreams, but why they exist and what function they serve, if any, remain unknown. Additionally, while muscle tone is normal in NREM sleep, we are almost completely paralyzed in REM sleep.

electroencephalogram (EEG)

An *EEG* is a test that measures and records the electrical activity of your brain.

A secondary clinical use of *EEG* is in the diagnosis of coma, encephalopathies, and brain death.

electrodes

An electrode is an electrical conductor used to make contact with a nonmetallic part of a circuit.

For the purpose of electroencephalography, multiple electrodes are placed on the scalp.

scalp

The soft tissue envelope of the cranial vault is called the *scalp*.

At least half of all people with psoriasis have scalp psoriasis.

synchronized

Synchronized skating is a popular discipline around the world.

Synchronization is timekeeping which requires the coordination of events.

synapses

Synapse is the point of connection, usually between two nerve cells.

Synapses have neuroreceptors that are sodium channels.

electrooculogram (EOG)

The electro-oculogram (EOG) is a widely used electrophysiological test,

Electrooculography (EOG) is a technique for measuring the resting potential of the retina.

electromyogram (EMG)

An electromyogram (EMG) measures the electrical activity in one's muscles.

wakefulness

The explanation behind wakefulness and sleep is still in its infancy.

Wakefulness is a daily recurring brain state and state of consciousness.

amplitude

Amplitude is the magnitude of change with each oscillation within an oscillating system.

Amplitude is the objective measurement of the degree of change, positive or negative.

spindles

Spindle (in textiles) is a device to spin fibres into thread.

Spindle (tool) is the main rotating part of a machine tool, woodworking machine, etc.

bursts

The sacks were bursting with grain.

Gamma-ray *bursts* (GRBs) are flashes of gamma rays observed in distant galaxies.

dart

dart is a slender, pointed missile, often having tail fins, thrown by hand or shot from a blowgun.

The squirrel darted its head from side to side before scampering up the tree.

jerk

In physiology, *jerk* is a sudden reflexive or spasmodic muscular movement.

jerks refer to involuntary convulsive twitching often resulting from excitement.

muscle tone

muscle tone refers to the amount of tension or resistance to movement in a muscle.

We all know that exercise improves muscle tone.

- **Now you try to make sentences of your own with:** *pattern, voltages, chin, simultaneously, cerebral cortex, monitor, amplitude, curves, socket, predictable, stages, images, dreams, paralyzed.*

50 **Slowly progressive visual agnosia**

Visual agnosia is characterised by difficulty in recognising visually presented objects in the absence of impairment of primary visual and intellectual functions. Some scientists proposed the distinction between apperceptive agnosia, related to the perceptual analysis of the stimulus, and associative agnosia, related to the association between the conscious percept and its meaning. Patients with apperceptive agnosia cannot copy a design or match an object or a figure to a sample. Patients with associative agnosia cannot recognise or name an object but they can copy it, name it from verbal description, and mime its use. Different cases of apperceptive and associative visual agnosia have been described, and in a few cases visual agnosia has been included in a picture of multisensorial agnosia with tactile and auditory agnosia.

Most cases of visual agnosia follow acute vascular, traumatic, or tumour lesions in the occipital areas, herpes encephalitis, or carbon monoxide poisoning. In these conditions, apperceptive agnosia has been associated with bilateral damage of the occipital and posterior temporal areas, while associative agnosia has been related to left posterior cortical damage. Progressive visual agnosia is a particular condition that slowly worsens with the addition of different visually-mediated deficits all the way to a complete Balint-Holmes syndrome or global dementia. This picture resembles other chronic cognitive deficits, such as progressive aphasia, constructive apraxia, impairment of spatial exploration, and astereognosis, as all they are characterised by chronic worsening and focal cortical atrophy. Slowly progressive visual agnosia is associated with posterior cortical atrophy, which contrasts with the gross brain damage reported in other cases of visual agnosia. On these grounds, the question has been raised of whether the results of specific neuropsychological assessment, neuroimaging, and functional examination would indicate the same cortical region, clarifying the neuroanatomical correlates of primary visual agnosia.

To describe a case of slowly progressive visual agnosia that allows to document the relation of visual agnosia without dementia to left temporoparietal atrophy with decreased cortical metabolism, longitudinal clinical and neuropsychological assessment, combined with magnetic resonance imaging (MRI), spectroscopy, and positron emission tomography (PET) were used.

agnosia

agnosia refers to a loss of ability to recognize objects, people, sounds, shapes, or smells.

time agnosia is the loss of comprehension of the succession and duration of events.

apperceptive

apperceptive agnosia is the visual disorder that renders a person unable to recognize objects.

apperception refers to understanding something perceived in terms of previous experience.

associative

Associative operations are abundant in mathematics.

associativity is a property of some binary operations.

percept

percept refers to the object of perception.

percept also refers to the mental impression of something perceived by the senses.

multisensorial

A *multisensory* teaching approach helps a child to learn through more than one of the senses.

Multisensory instruction uses the visual, auditory, and kinesthetic learning.

lesions

A *lesion* is any abnormality in the tissue of an organism, usually caused by disease or trauma.

Most skin *lesions* presented by patients are benign.

herpes encephalitis

Herpes encephalitis is a rapidly progressing disease.

Herpesviral encephalitis is *encephalitis* associated with *herpes* simplex virus.

temporal areas

Brodmann area 22 is also known as *superior temporal area 22*.

The *medial superior temporal (MST) area* is a part of the cerebral cortex.

apraxia

apraxia is a disorder caused by damage to specific areas of the cerebrum.

Apraxia is a disorder of motor planning.

astereognosis

astereognosis is the inability to identify an object by touch without visual input.

Astereognosis is associated with lesions of the parietal lobe of the cerebral cortex.

temporoparietal

The *temporoparietal* junction is an area of the brain where the temporal and parietal lobes meet.

positron emission tomography (PET)

PET is a test that uses a special type of camera and a radioactive tracer.

PET is an imaging technology that allows to visualize the body's abnormal cellular activity.

spectroscopy

Spectroscopy is the study of the interaction between matter and radiated energy.

magnetic resonance imaging (MRI)

An *MRI* scan uses powerful magnets and radio waves to create pictures of the body.

MRI is used in detecting structural abnormalities of the body.

- **You should now try to explain the meanings of:** *intellectual, copy, design, match, sample, mime, auditory, tactile, exploration.*

51 Smoking worsens the prognosis

Multiple sclerosis (MS) is regarded as a chronic autoimmune disorder that selectively affects the central nervous system. Typically, in the early phase of the MS disease new symptoms appear and resolve (relapsing remitting MS – RRMS), whereafter a continuous deterioration occurs (secondary progressive MS – SPMS). It is assumed that these two phases correspond to an inflammatory process and neurodegeneration, respectively. Except for the primary-progressive (PPMS) clinical subtype, which affects about 10% of persons with MS and is characterised by a continuous progression in the absence of relapses, there is a 2:1 female surplus in MS incidence. The prognosis in MS varies between individuals, but depends mostly on how early the progressive MS disease course occurs.

Cigarette smoking is associated with a huge number of adverse health effects, such as cardiopulmonary disease, infections and cancer. Smoking is associated with an increased risk for autoimmune diseases, such as MS, rheumatoid factor positive rheumatoid arthritis (RA), systemic lupus erythematosus, and autoimmune thyroid disease. Smoking not only increases the risk for acquiring several diseases, but is also associated with worsening of the prognosis of lung cancer and cardiovascular disease. As for the effect from smoking in MS, an increased risk for conversion from RRMS to SPMS has been shown.

Past smoking, especially when started at an early age, is associated with a worsened MS prognosis. Ever smokers develop progressive disease earlier after MS onset, suggesting that toxic effects from smoking promote neurodegeneration in MS. Together with a higher prevalence of smokers among men, this may possibly explain why the gender difference in MS incidence, a 2:1 female surplus, is lacking for PPMS, where the incidence is similar for men and women.

An increased risk for conversion from RRMS to SPMS was shown in ever smokers compared with never smokers. The negative effect from smoking on prognosis was most evident in the subset with an early smoking start (<15 years of age). Whereas there was a trend for ever smokers with later smoking debut to fare worse than never smokers, the difference was not significant. Starting smoking in adolescence is associated with an increased likelihood for maternal smoking during pregnancy, but may also in itself affect future immune function.

autoimmune

There are more than 80 known types of autoimmune diseases.

Some autoimmune diseases are rare; others, such as Hashimoto's disease, affect many people.

selectively

Cell membranes are *selectively* permeable.

That college has a highly *selective* admissions process.

typically

The *typical* car owner drives 10,000 miles a year.

Köhler disease typically affects boys, but it can also affect girls.

deterioration

Deterioration (commonly used in health care), describes worsening of a patient's condition.

What are the key areas relating to recognition and treatment of the deteriorating patient?

respectively

respectfully and *respectively* often get misused in both spoken and written language use.

Listen to me, I'm referring to each of you *respectively*.

incidence

incidence relates to the risk of developing a new condition within a specified period of time.

We can speak of the high *incidence* of heart disease in men over forty.

adverse

Adverse interest, in law, is anything that functions contrary to a party's interest.

It is easy to confuse *adverse* and *averse* but their meanings are totally different!

cardiopulmonary

Cardiopulmonary syndromes are conditions of both the heart and the lung.

Some *cardiopulmonary* syndromes may be caused by cancer.

rheumatoid

Rheumatoid arthritis affects mostly women.

What are the symptoms and signs of *rheumatoid arthritis*?

arthritis

Arthritis is a form of joint disorder that involves inflammation of one or more joints.

Arthritis involves the breakdown of cartilage.

lupus erythematosus

Systemic lupus erythematosus (SLE) is an autoimmune disease.

Lupus erythematosus is a category for a collection of diseases with similar underlying problems.

thyroid

The *thyroid* gland, in vertebrate anatomy, is one of the largest endocrine glands.

Hypothyroidism refers to an underactive *thyroid*.

debut

debut (also spelled *début*) is a first appearance, a formal entrance into society.

The company *debuted* at the World Congress of Ultrasound in Medicine and Biology (WFUMB).

pregnancy

The *pregnancy* guide can help you find information on *pregnancy* and childbirth.

Pregnancy is a very special situation, so all mothers-to-be should be sure to enjoy it!

- **What do the abbreviations MS, RRMS, SPMS, PPMS stand for? Give your examples using: chronic, phase, surplus, associated, increased, toxic, rheumatoid arthritis, conversion.**

52 **That's why your sinuses are bunged up!**

Sinusitis is the medical term for inflammation in the sinuses, the small, air-filled cavities inside the skull. Each sinus is lined with the same sensitive tissue that covers the inside of the nose. This moist lining releases a constant supply of mucus that feeds down into the nose to keep the nasal passages moist and ensures dust, allergens and pollutants are trapped there before they can penetrate the lungs. Unfortunately, constant changes in atmosphere are putting this delicate system under pressure. The human nose evolved millions of years ago when changes in temperature happened gradually with the seasons. This meant it had time to adapt. Now, with central heating and air conditioning we are constantly exposing the nose and the sinuses to swings in temperature and humidity which affect the way the lining of the nasal passages works.

Most sinus infections start with a cold. The virus irritates the sensitive tissues, which then become inflamed, blocking the drainage hole, the ostium, so mucus cannot drain down into the nose. If the mucus contains the wrong mixture of bugs, then this can cause an infection. Symptoms include a fever, throbbing pain, tiredness, bad breath, a feeling of pressure in the ears. Up to one in 20 people suffer with a perfume allergy and it is a common cause of sinus problems, as well as other symptoms ranging from skin rashes and shortness of breath to nausea and dizziness. In a small number of cases, acute sinusitis can lead to the formation of tiny grape-like growths called polyps in the nostrils and inside the sinuses, which can block the sinuses and help create the right conditions for a bacterial infection. The problem with central heating is that drier indoor conditions, which can also be caused by air conditioning, reduce the amount of mucus we produce; this in turn causes inflammation in the lining of the sinuses. Mucus can start to accumulate inside the sinus space and any bacteria lurking inside get the chance to start breeding, causing an infection. Chlorine used to disinfect swimming pools and the bacteria that circulate in the water can both cause sinus problems. When a tooth in the upper jaw becomes infected, the bacteria can literally burrow through the bone structure above the teeth and into the sinus above. The reverse can also happen. Grass or birch tree pollen are major triggers for hay-fever sinusitis: as tiny fragments of pollen penetrate the airways, they irritate the mucus membranes in the same way a cold virus would. An infection is most likely to develop in the maxillary sinuses, the two larger cavities close to the nose behind the cheekbones.

skull

The skull supports the structures of the face and forms a cavity for the brain.

Animals that have skulls are called *craniates*.

mucus

mucus is a slippery secretion produced by, and covering, mucous membranes.

The average human body produces about a liter of mucus per day.

pollutants

Pollutants can be either foreign substances or naturally occurring contaminants.

It was the industrial revolution that gave birth to environmental pollution as we know it today.

ostium

In a frontal section, *ostium maxillare* is seen to be placed near the roof of the sinus.

In the developing heart, *ostium primum* lies below the free margin of the *septum*.

rash

A rash may be localized in one part of the body, or affect all the skin.

Rashes may cause the skin to change color, itch, become warm, bumpy, dry, or blistered.

nausea

nausea is a sensation of unease and discomfort in the upper stomach.

Medications taken to prevent nausea are called *antiemetics*.

dizziness

dizziness refers to an impairment in spatial perception and stability.

One can induce dizziness by engaging in disorientating activities such as spinning.

polyps

A *polyp* in zoology is cylindrical in shape and elongated at the axis of the body.

polyp, in medicine, is an abnormal growth of tissue projecting from a mucous membrane.

chlorine

chlorine is the chemical element with atomic number 17 and symbol *Cl*.

The most common compound of chlorine, sodium chloride, has been known for ages.

bacteria

Bacteria are a large domain of prokaryotic microorganisms, a few micrometres in length.

The ancestors of modern bacteria were the first forms of life to appear on Earth.

pollen

pollen is a fine to coarse powder containing the *microgametophytes* of seed plants.

Pollen grains come in a wide variety of shapes, sizes, and surface markings.

hay fever

Hay fever is another name for allergic rhinitis, or pollenosis.

Hay fever usually causes sneezing, itchy and watery eyes, an increase in mucus production.

membrane

The *cell membrane* separates the interior of all cells from the outside environment.

The *mucous membranes* are involved in absorption and secretion.

maxillary sinuses

The pyramid shaped *maxillary sinus* is the largest of the paranasal sinuses.

The maxillary sinus is present at birth as rudimentary air cells.

- **Think up your own sentences with:** *cavities, sensitive, moist, penetrate, evolved, irritate, bugs, humidity, burrow, birch, cheekbones, suffer, delicate, swings, nostrils, lurk.*

53 Some of the incidents he remembered...

There was no continuity in his recollection of his internship. He could never recall which wards he had been on, his only memory was that of scattered episodes, without relationship to the time when they occurred.

There was the patient who expired of cardiac arrest during an elective hernia repair; the surgeon cut into the chest and massaged the heart with his hand, and Crest got a chance to squeeze the flabby muscle of the heart; they kept the patient going artificially for hours, but he did not recover.

There was the woman who walked into the Accident Room with a ruptured eyeball and the contents of the eye running down her cheek. She had been struck in the eye by the point of a high-heeled slipper.

There was the baby who had fallen out a three-story window and had landed on a concrete pavement on its head and showed nothing whatever as a consequence: no laceration, no abrasion, no skull fracture, and no brain injury.

And there was the wino who had fallen on a railroad track and been run over by a freight, with total amputation at the level of the belly button. They brought the top half of him in, fully conscious, in no pain, drunk and happy as ever, and the top half of him lived on for a matter of many hours.

And the man who had been shot through the head, in one side of the skull and out the other, and there was a small collection of brain matter in his hat. The patient walked in and an hour later walked out, showing no apparent effects from the hole in his head.

And the time Crest saw a surgeon cut the cystic artery during a gall-bladder operation. The surgeon thought the artery had been clamped. Crest knew it hadn't. He tried to warn the surgeon. The surgeon cursed at him, and cut the artery. The wound was the approximate size and shape of a can containing tennis balls, and the surgeon lost his head completely and started grabbing around blindly in the pool of blood with a hemostat. He had to push the surgeon from the table forcefully, taking charge himself, compressing the aorta against the backbone with one fist, sucking out the blood with a suction tip held in his other hand, finding the end of the spurting artery, clamping it, and tying it. The surgeon was at the other side of the operating room, in a hysterical collapse, crying like a schoolgirl. This patient survived.

internship

Internship is a system of on-the-job training for white-collar jobs, similar to an apprenticeship. An *internship* is a great way for career changers to explore new career opportunities.

cardiac arrest

Cardiac arrest is also known as *cardiopulmonary arrest* or *circulatory arrest*.

In sudden *cardiac arrest* the heart develops an arrhythmia that causes it to stop beating.

elective

elective, used as an adjective, means that something is optional and chosen by election.

Elective surgery is scheduled in advance, because it does not involve a medical emergency.

hernia

A *hernia* is the protrusion of an organ through the wall of the cavity that normally contains it.

Hernia symptoms and signs include pain and swelling in the abdominal or groin area.

flabby

flabby flesh yields to the touch, and is easily moved or shaken.

flabby is an adjective, used in describing a body which is overweight, with hanging parts of fat.

laceration

A cut, also called a *laceration*, is a break or opening in the skin.

Crush injury from a direct blow may produce an irregular or stellate *laceration*.

amputation

amputation is the removal of a body extremity by trauma, prolonged constriction, or surgery.

As a surgical measure, *amputation* is used to control pain or a disease process.

cystic artery

The *cystic artery* supplies oxygenated blood to the gallbladder and cystic duct.

The *cystic artery* is a branch of the hepatic artery.

gall-bladder

In vertebrates the *gall bladder* (Biliary Vesicle) is a small organ that aids mainly in fat digestion.

The most common symptom of *gall-bladder* disease is intermittent pain called biliary colic.

clamped

A wheel *clamp*, (*wheel boot*) is a device that is designed to prevent vehicles from being moved.

When someone “clamps” you it means you’re wrong and you can’t make a come back.

hemostat

A *hemostat* (*hemostatic clamp*) is a vital surgical tool used in almost any surgical procedure.

Hemostats (*surgical forceps*) have a locking mechanism for clamping tubing.

suction

suction is the flow of a fluid into a partial vacuum, or region of low pressure.

That company is a large provider of aspirators and *suction* machines to hospitals.

spurting

spurting is a sudden short burst, as of energy, activity, or growth.

Blood *spurt* (blood *squirt*, blood *spray*, blood *gush*) is the effect when an artery is cut.

collapse

collapse is a sudden and often unannounced loss of postural tone (going weak).

When a *collapse* is accompanied by a loss of consciousness (often), the term *syncope* is used.

- **Try now to make sentences with:** *recall, recollection, ward, wards, scattered, expire, artificial, artificially, rupture, ruptured, fracture, abrasion.*

54 Specialized language areas

A key source of information about the function of the brain regions is the effects of damage to them. In humans, strokes have long provided a “natural laboratory” for studying the effects of brain damage. This is how it became known that the left hemisphere of the human brain usually contains the specialized language areas. While this holds true for 97% of right-handed people, about 19% of left-handed people have their language areas in the right hemisphere and as many as 68% of them have some language abilities in both the left and the right hemisphere. The two hemispheres are thought to contribute to the processing and understanding of language: the left hemisphere processes the linguistic meaning of prosody (or, the rhythm, stress, and intonation of connected speech), while the right hemisphere processes the emotions conveyed by prosody. Studies of children have shown that if a child has damage to the left hemisphere, the child may develop language in the right hemisphere instead. The younger the child, the better the recovery. So, although the “natural” tendency is for language to develop on the left, human brains are capable of adapting to difficult circumstances, if the damage occurs early enough.

The first language area within the left hemisphere to be discovered is Broca’s area, named after Paul Broca, who discovered the area while studying patients with aphasia, a language disorder. Broca’s area doesn’t just handle getting language out in a motor sense, though. It seems to be more generally involved in the ability to process grammar itself, at least the more complex aspects of grammar. For example, it handles distinguishing a sentence in passive form from a simpler subject-verb-object sentence – the difference between “The girl was hit by the boy” and “The boy hit the girl.”

The second language area to be discovered is called Wernicke’s area, after Carl Wernicke, German neurologist who discovered the area while studying patients who had similar symptoms to Broca’s area patients but damage to a different part of their brain. Wernicke’s aphasia is the term for the disorder occurring upon damage to a patient’s Wernicke’s area. Wernicke’s aphasia does not only affect speech comprehension. People with Wernicke’s aphasia also have difficulty recalling the names of objects, often responding with words that sound similar, or the names of related things, as if they are having a hard time recalling word associations.

damage

In biology and medicine, *damage* refers to any form of injury.

A disease can be explained as a somatic damage.

stroke

stroke was previously known medically as a *cerebrovascular accident (CVA)*.

A stroke is a medical emergency and can cause permanent neurological damage.

hemisphere

A cerebral hemisphere is a division of the cerebrum.

Macroscopically, the brain hemispheres are roughly mirror images of each other.

prosody

Prosody (linguistics) is the study of rhythm, intonation, stress, and related attributes in speech.

In poetry, *prosody* is the study of meters and forms of versification.

rhythm

In the performance arts rhythm is the timing of events on a human scale.

Rhythm may also refer to visual presentation, as "timed movement through space."

stress

The stress response is the body's way of protecting the person.

The term *stress* was first employed in a biological context in the 1930s.

intonation

Intonation (in linguistics) is the variation of tone used when speaking.

conveyed

A fleet of trucks will convey the produce to the market.

Nerve cells convey and receive nervous impulses.

aphasia

Aphasia is a condition that is the result of damage to portions of the brain.

Auditory aphasia is impairment in the understanding of auditory language and communication.

disorder

Bipolar disorder (manic depression) is a mental illness characterized by severe mood swings.

Antisocial personality disorder (ASPD) has many symptoms, signs, and causes.

neurologist

A neurologist specializes in the diagnosis and treatment of disorders of the nervous system.

Some of the conditions treated by neurologists include headaches, neuropathy, dementia,...

comprehension

Comprehension, in general usage, has roughly the same meaning as *understanding*.

Reading comprehension is defined as the level of understanding of a text.

recalling

recall may refer to *recollection*, recall from memory.

recall is synonymous to *remember*, *recollect*.

associations

To avoid insomnia, recondition yourself to associate the bed with sleep.

Lipoproteins are proteins that associate with cholesterol

- **Now you make sentences with:** *key, function, effects, specialized, abilities, process, motor, aspects, distinguishing.*

55 **The tragical relationship**

In some parts of the United States, community violence has reached epidemic proportions, as findings suggest that one third or more of inner city children have been directly victimized and almost all inner city children have been exposed. Although one may assume that inner city youth from other Western countries also experience exposure to violence, no epidemiological studies from outside North America have addressed this issue. Therefore, research on the prevalence of exposure to violence in non-American communities should be conducted.

Over the last decade of the twentieth century, research documented a link between adolescent exposure to community violence and a series of mental health problems, including internalizing symptomatology, low self-esteem, posttraumatic stress, externalizing behavior, and approval of aggression. Follow-up studies have demonstrated that community violence is associated with an increase in internalizing symptomatology and aggressive and antisocial behavior, even when controlling for earlier levels of such psychopathology. Related to the issue of exposure to community violence are findings on the psychological consequences of child abuse. The plethora of studies on this topic described strong relationships between traumatization and psychopathology. Specific associations were suggested by type of abuse and by gender. Girls were found to react more with internalizing symptomatology whereas boys showed more externalizing behavior. Suicidal tendencies were demonstrated to be higher in abused than in non-abused children and adults, although some controversy surrounds the prevalence of suicidality in physically abused children.

Research on the consequences of exposure to community violence is growing, but only a few studies have sought to elucidate the link with suicidal behavior, and all have reported a positive relationship between suicide risk and exposure to violence. Given the high rates of suicide throughout the world, it is important to identify the specific risk factors, including violence exposure, for such destructive behavior. The current study addresses the relationship between violence exposure and suicide risk by examining community violence in a European inner city and then analyzing the prevalence of suicidal ideation and deliberate self-harm in adolescents exposed to violence. In addition, to be assessed is the degree to which the relationship between violence exposure and suicidal behavior would be reduced when controlling for depressive symptomatology, aggressive antisocial behavior, or both.

victimized

Child *peer victimization* is the case of being a target of aggressive behavior of other children. The whole family were *victimized* because of their religion.

assume

assume means to believe something is true based upon general unproven observations. In logic, an *assumption* is a proposition that is taken for granted.

adolescent

Adolescents are young people between the ages of 10 and 19. A society needs to invest in the health and development of *adolescents*.

internalizing

internalization is the long-term process of embedding one's own beliefs, attitudes, and values. Internalization is also often associated with learning (for example, learning ideas or skills).

symptomatology

symptomatology is the science that studies the symptoms of diseases. "Symptomatology" was first used in popular English literature sometime before 1784.

externalizing behavior

Externalizing behaviors are actions directed out toward others. *Externalizing* problems are associated with health-damaging *behaviour* and bullying others.

self-esteem

Self-esteem is a term reflecting one's overall evaluation or appraisal of his or her own worth. Building *self esteem* and self confidence is the key to happiness and success.

posttraumatic stress

Posttraumatic stress disorder is a serious mental condition. *Post-traumatic stress* disorder can occur after you've seen or experienced a traumatic event.

child abuse

Child abuse is the physical, sexual, emotional mistreatment, or neglect of a child. Is there an association between poverty and *child abuse*?

suicidality

suicidality refers to suicidal thinking or behavior. Factors such as unemployment, poverty, homelessness,... may trigger *suicidal* thoughts.

elucidate

elucidate means *to give an explanation* that serves to clarify. *elucidation* is an *interpretation* that removes obstacles to understanding.

risk factors

A *risk factor* is something that is likely to increase the chances that a particular event will occur. A *risk factor* is a variable associated with an increased risk of disease or infection.

destructive

Destructive storms wipe out whole towns and cause billions of dollars worth of damage. *Destructive* criticism is intended to disprove or discredit, offering no positive suggestions.

ideation

Ideation (idea generation) is the process of creating new ideas. People strong in the *ideation* theme are fascinated by ideas.

- **Now you make sentences with:** *epidemic, proportions, exposed, conduct, link, approval, aggression, antisocial, antisocial behavior, gender, plethora.*

56 A typhoid carrier somewhere in the hospital...

– To begin with, let's summarize. – Harvey Chandler was holding his page of notes, and his glance moved theatrically around the room. He's enjoying this, O'Donnell thought; but then he always does enjoy attention. The medical chieftain went on – The picture so far is that we have two definite cases of typhoid and four suspected. All of the cases are hospital employees, and we may count ourselves fortunate that no patients are affected yet. Because of the number of cases I'm sure it's evident to you, as it is to me, that we have a typhoid carrier somewhere in the hospital. Now, I may say I'm as shocked as everyone else must have been to learn that examination of food handlers here hasn't been done for...

Then, after a barely perceptible pause, he went on – For the benefit of those of you who are not familiar with typhoid, and I realize there will be some, because there isn't too much of it around nowadays, I'll run over the principal early-stage symptoms. Generally speaking, there's a rising fever, chills, and a slow pulse. There's also a low blood count and, naturally, the characteristic rose spots. In addition to all that a patient will probably complain of a dull headache, no appetite, and general aching. Some patients may say they're drowsy in the daytime and that they're restless at night. One thing to look out for also is bronchitis; that's quite common with typhoid, and you may encounter nosebleed too. And, of course, a tender, swollen spleen.

The chief of medicine sat down. O'Donnell asked – Any questions?

Lucy Grainger asked – I take it that typhoid shots are being arranged.

– Yes – Chandler said – for all employees and staff, also patients who are well enough to have them.

– The immediate problem – Pearson now said – is to locate the source of infection. Because of the failure to check food handlers properly over the past six months it is logical that we should suspect food as a means of contamination and should begin our search there. For this reason there must be a medical inspection of all food handlers before the next hospital meal is served. The time is now 2:15 p.m. That gives us two and three-quarter hours. In that time every employee who has any part in the preparation and serving of hospital food is to be given a thorough physical check. Facilities are being set up now in the outpatient clinics. I understand that all the internists and house staff were notified before this meeting.

typhoid

Typhoid is caused by an infection with bacteria called *Salmonella Typhi*.

For *typhoid* fever, the patient should drink orange juice as it hastens recovery and gives energy.

theatrically

theatrical means marked by exaggerated self-display, unnatural behavior; affectedly dramatic.

– I cannot show my face at her house! – he declared *theatrically*.

chieftain

chieftain is the chief of a clan or a tribe; a leader of a group, band, etc.

Chieftain was the main battle tank of the United Kingdom during the 1960s and 1970s.

carrier

Carrier protein is a protein that facilitates the transport of another molecule.

carrier is a catalyst or other intermediary in a chemical reaction.

Genetic *carrier* is an organism inheriting a genetic trait or mutation, but displaying no symptoms.

food handlers

A *food handler* is sbd. who handles food, or surfaces that are likely to be in contact with food.

Food handlers have specific responsibilities related to their health and hygiene.

What must a *food handler* do if she or he is sick?

chills

chills refers to feeling cold after an exposure to a cold environment.

chills can also refer to a sudden numbing fear or dread.

At that moment the bad news put a *chill* on the celebration.

drowsy

Somnolence (*drowsiness*) is a state of near-sleep, a strong desire for sleep.

One's daytime *drowsiness* can perhaps be related to his feelings about his work.

bronchitis

Symptoms of acute *bronchitis* usually begin 3 to 4 days after an upper respiratory infection.

When a person has *bronchitis*, it may be harder for air to pass in and out of the lungs.

nosebleed

Nosebleeds are fairly common, particularly in children, and can often be treated at home.

Nosebleeds usually originate from the septum, just inside the nose.

tender

tender is something that is easily crushed or bruised, something fragile.

A *tender glance* is a one characterized by or expressing gentle emotions; loving.

contamination

Contamination is the presence of a minor and unwanted constituent (contaminant).

Radioactive contamination, also called *radiological contamination*.

outpatient clinics

Outpatient clinic is a health care facility primarily devoted to the care of *outpatients*.

An *outpatient clinic* can also be called an *ambulatory care clinic*.

internists

Internists are qualified physicians with postgraduate training in internal medicine.

Internists should not be confused with *interns*, doctors in their first year of residency training.

Internists may act as primary care physicians, but they are not "family physicians" or GPs.

- **Think up your own sentences with:** *summary, summarize, suspect, suspected, employ, employees, employers, principal, principle, complain, rest, restless, bare, barely, barely perceptible, immediate, shots, check.*

57 **When economics and endocrinology meet...**

Given the stereotypes about what can be met on the trading floor, it should be no surprise that a study linking trading and testosterone has attracted attention. Researchers from Cambridge University studied 17 male traders at work and discovered that for each individual, temporarily higher testosterone levels seemed to be both cause and consequence of a profitable trading day. Yet one can have too much of a good thing. On volatile days the traders are flooded with cortisol, a stress hormone, while too much testosterone turns calculated risk-taking into recklessness.

One of the researchers, himself once a Wall Street trader, comments that, contrary to macho stereotypes, these hormonal surges are masked by demeanours of icy calm. Alas, rational judgment is suspended nonetheless!

This is certainly not the first research to suggest that traders are sometimes irrational. It is not even the first study to investigate the physiology of traders: earlier researchers discovered that traders experienced “arousal” during moments of volatile trading. (It is with some relief that we discover that “arousal” referred to skin conductivity.)

What may catch attention, then, is the speculation that markets might be more stable if more traders were women. That is certainly an interesting possibility. Education researchers have already found that girls are a positive influence in the classroom, both on each other and on boys. Might not the same be true on the trading floor? The trading room that played host to this study had only four female traders out of 260, but if the hunch is correct that will need to change. Managers could hire traders after holding blind trials of trading ability: it is possible that women, at lower risk of testosterone poisoning, might excel at such trials. Another bastion of masculinity, the world of professional US orchestras, unexpectedly found itself hiring women when blind auditions were introduced, so such a recruitment scheme is surely worth a try.

But what if few women win such trials, or few have a taste for life on the trading floor? In that case, testosterone and cortisol must be drained from the system whenever they build to dangerous levels. Elevator music, fish tanks on desks, tai chi: all must be considered as vital tools for reducing stress.

endocrinology

Endocrinology is a branch of biology and medicine dealing with the endocrine system.
Endocrinology is the study of the biosynthesis, storage, chemistry, and function of hormones.

testosterone

Testosterone is a steroid hormone from the androgen group, found in vertebrates.
Testosterone helps to develop the primary and secondary sexual characteristics in males.

volatile

In chemistry, *volatile* is a substance evaporating readily at normal temperatures and pressures.
Volatile anaesthetics is a class of anaesthetics which evaporate easily.

cortisol

Cortisol (hydrocortisone) is a steroid hormone, or glucocorticoid, produced by the adrenal gland.
A *cortisol level* is a blood test that measures the amount of *cortisol*.

hormonal surges

Testosterone levels *surge* in people and animals who win important competitions.
With high *hormonal surges*, we lose any sense of responsibility.

demeanours

demeanour/demeanor is the way a person behaves towards others, his/her conduct.
Her dignified *demeanour* was what impressed us the most.

suspended

In persons nearly drowned the vital functions have been temporarily *suspended*.
As a punishment for what he had done, the student was suspended from school.

arousal

Arousal is a physiological and psychological state of being awake or reactive to stimuli.
Arousal is an aspect of learning theories, related to concepts such as anxiety, attention, stress.

speculation

speculation refers to contemplation or consideration of a subject; meditation.
speculation also has to do with taking large risks, esp. with respect to trying to predict the future.

hunch

hunch is an *intuitive feeling* or a *premonition*.
Hunch refers to a forward bend in one's body, such as that from a crushed vertebra.

hire

hire can mean *payment for the temporary use of something*.
That company offers a vast range of tools and equipment *to hire*.

excel

excel means to show superiority, to surpass others.
As a lawyer, she even *excelled* her father!

drained

drain means to draw off (a liquid) by a gradual process.
Drainage is the natural or artificial removal of surface and sub-surface water from an area.

recruitment

recruitment is the process of attracting, screening, and selecting qualified people for a job.
Recruitment consultants work to match their pool of candidates to their clients' open positions.

- **Now you try to make sentences of your own with: economy, economics, stereotypes, cause, consequence, profitable, trade, trader, trading, trading day, trading floor, reckless, recklessness, irrational, bastion of masculinity.**

58 Why do you feel so tired?

Struggle to get out of bed in the morning? Worn out all the time? You are not alone. Chronic tiredness is one of the most common reasons people go to their GPs. At any time, one in every five people feels unusually tired and one in ten has prolonged fatigue. Of course, feeling exhausted or run down could be down to the breakneck pace of our 24/7 lifestyle, which can play havoc with sleeping patterns, but doctors must not exclude the possibility of serious illness. Tiredness itself is not an illness, but rather will be the symptom of a condition – whether it's physical, psychological or social. But if this doesn't appear to be the case, it could be that being tired is due to an underlying medical problem. With the help of a range of experts, we can examine what could be causing *your* tiredness...

If you are tired, for example, feeling weak and breathless, if your other symptoms include swollen ankles, feet, legs, stomach and veins in the neck, chest pain after heavy meals or exercising, a possible cause could be cardiomyopathy – a disease of the heart muscle. This causes the heart walls to thicken, particularly in the left ventricle, which is the main pumping chamber. As a result, the heart stops pumping blood effectively round the body. As the heart muscle isn't working properly, there is less oxygen circulating around the body, which is why the condition causes such tiredness. The condition can be inherited, or triggered by heart disease or even an infection. Around 125,000 Britons suffer from it and, untreated, it can be fatal. And what about the treatment? Drugs known as ace inhibitors improve the symptoms by relaxing the blood vessels, improving blood flow from the heart. Beta-blockers can also reduce the heart's workload and increase its efficiency.

When you are feeling foggy, dazed, groggy, with dry mouth, constipation or diarrhea, many would think allergies such as hay fever are to blame. In fact, what makes sufferers tired is their anti-histamine medication. These drugs act on receptors in the brain that make you feel sleepy. That is why it is vital not to give children some of the so-called older generation antihistamine tablets for allergies at exam time. A 2007 study in Britain found that nearly three-quarters of students taking hay fever medication could expect to drop a grade in their exams! Remember thus that older forms of antihistamine, though highly effective at treating allergies, are more likely to make you feel tired.

fatigue

Mining is fatiguing work.

The air crash was caused by metal fatigue in a wing section.

havoc

His sudden illness *played/wreaked* havoc *with* our plans.

The hurricane created havoc over a wide area.

breathless

He gasped for *breath* as he surfaced from the dive.

People with emphysema *breathe* with difficulty.

swollen

The painful *swelling* was caused by an insect bite. Her hand *swelled up* from the bee sting.

Mumps give you swollen glands.

myopathy

A myopathy is a muscular disease resulting in muscular weakness.

Metabolic myopathies are genetic diseases, usually inherited, that affect the body's muscles.

ventricle

The ventricles of the heart function to pump blood to the entire body.

Within the cerebral hemispheres and brain stem there are a series of cavities called ventricles.

chamber

The heart has four compartments or cavities called chambers.

There's a *chamber pot/chamber* under your bed in case you need it.

triggered

My migraine was triggered by too many late nights.

A trauma trigger is an experience that triggers a traumatic memory.

fatal

He suffered fatal injuries and died before reaching the hospital.

Two people were fatally wounded in the shoot-out.

treatment

Treat the skin rash with this ointment!

Cancer is treatable if detected in time.

inhibitors

Vaccinations inhibit the spread of infectious diseases.

The inhibition of a child's natural curiosity slows down his or her intellectual development.

foggy

I'm afraid I have only a foggy idea of what you mean – could you explain that again, please?

I haven't the foggiest idea where she is at the moment.

groggy

The hard blow left the boxer *groggy* – weak and dizzy.

She stood up groggily after her fall.

constipation

Lack of fibre in your diet can make you constipated, with difficulty in emptying the bowels.

Stewed prunes can relieve constipation.

- **Try now to make sentences of your own using:** *struggle, worn out, GP, GPs, sleeping patterns, symptom, condition, cardiomyopathy, disease, oxygen, circulate, suffer, relax, allergy, anti-histamine.*

59 Working together for the benefit of the total being...

The human body is made up of billions of smaller structures of four major kinds. Billions of microscopic parts, each with their own identity, work together in an organized manner for the benefit of the total being.

Cells, long recognized as the simplest units of living matter that can maintain life and reproduce themselves, compose all living things, from single-celled plants to multibillion-celled animals. The human body begins as a single, newly fertilized cell. According to some estimates, an average-sized adult body consists of 100 trillion cells.

Tissues are more complex units than cells. A tissue is an organization of great many similar cells that have similar structure and that function together as a unit, with varying amounts and kinds of nonliving, intercellular substance between them. A nonliving material, called the intercellular matrix, fills the spaces between the cells. This may be abundant in some tissues and minimal in others. The intercellular matrix may contain special substances such as salts and fibers that are unique to a specific tissue and give that tissue distinctive characteristics. There are four main tissue types in the body, each designed for specific functions: epithelial, connective, muscle, and nervous.

Organs are more complex units than tissues. An organ is an organization of several different kinds of tissues so arranged that together they can perform a special function. For example, the stomach is an organization of muscle, connective, epithelial, and nervous tissues. Muscle and connective tissues form its wall, epithelial and connective tissues form its lining, and nervous tissue extends throughout both its wall and its lining.

Systems are the most complex. A system is an organization of varying numbers and kinds of organs so arranged that together they can perform complex functions for the body. Ten major systems compose the human body: skeletal – bones, tendons, cartilage, ligaments; muscular – skeletal and smooth muscles; nervous – brain, spinal cord, nerves; endocrine – glands (hypothalamus, pituitary, thyroid, adrenal); cardiovascular – heart, blood vessels; lymphatic – lymph, lymph nodes and vessels, white blood cells, T- and B-cells; respiratory – nose, trachea, lungs; digestive – mouth, oesophagus, stomach, small and large intestine; urinary – kidneys, ureters, bladder, urethra; reproductive – ovaries, oviducts, uterus, vagina, testes, seminal vesicles, penis.

matrix

matrix is a situation or substance within which something originates, develops, or is contained. In anatomy, *matrix* is a formative part, as the corium beneath a nail.

salts

Salt (*table salt*, or *rock salt*) is a mineral that is composed primarily of sodium chloride (NaCl). Salts are ionic compounds that result from the neutralization reaction of an acid and a base.

epithelial

Epithelium is one of the four basic types of animal tissue.

Epithelial tissue covers the whole surface of the body.

tendons

tendon (*sinew*) is a tough band of fibrous connective tissue, usually connecting muscle to bone. When muscles contract, *tendons* pull on bones.

cartilage

Cartilage is the tough but flexible tissue that covers the ends of bones at a joint.

Fibrocartilage is the strongest and most rigid type of cartilage.

spinal cord

The *spinal cord* is part of the central nervous system (CNS) and is connected to the brain.

The human *spinal cord* is protected by the bony spinal column.

endocrine

Endocrine glands release hormones into the bloodstream.

endocrine system is a collection of glands that secrete chemical messages we call hormones.

digestive

The *digestive system* breaks down the food we eat.

The human digestive system is a complex series of organs and glands that processes food.

oesophagus

Oesophagus is the muscular tube through which food travels from the mouth to the stomach.

The human *oesophagus/esophagus* is about 23 cm (9 in) long.

large intestine

The *large intestine* ("large bowel") is the third-to-last part of the digestive system in vertebrates.

The large intestine is about 4.9 feet (1.5 m) long, about 1/5 of the length of the intestinal canal.

urinary

The *urinary (excretory) system* is the organ system that produces, stores, and eliminates urine.

In a sense, the *urinary tract* is a pretty simple system.

kidneys

The *kidneys* are a pair of vital organs that perform many functions to keep the blood clean.

In producing urine, the kidneys excrete wastes such as urea and ammonium.

bladder

The *bladder* is a hollow organ in the lower abdomen that stores urine.

The human urinary bladder is derived in embryo from the urogenital sinus.

seminal vesicles

A *seminal vesicle* is one of a pair of small tubular glands that are near the prostate.

The seminal vesicles secrete a significant proportion of the fluid that ultimately becomes semen.

- **Can you explain the meanings of:** *benefit, microscopic, identity, reproduce, maintain, fertilized, estimates, intercellular, tissue, connective, muscle, nervous, ligaments, system, skeletal, organ, function?*

60 The X-factor

In February, 2001, there was an air of euphoria in the corridors of the Necker Hospital for Sick Children in Paris. An incredible transformation was happening to an 11-month-old baby boy in an airtight bubble. In fact, history was being made there. For the first time, doctors had used their knowledge of the genes involved in a fatal disease to cure it. After years of experiments, gene therapy's promise to correct nature's flaws was being brought to life. Now that the human genetic code has been cracked, more and more of those flaws will come within reach of repair.

When the little boy was admitted to hospital, he was facing death from a rare inherited disorder called 'X-linked SCID', a disease that causes children to be born without a working immune system. The slightest infection can be deadly. For several days, the boy lay in his bubble and his only direct contact with his mother, father and nurse was through plastic gloves.

Meanwhile, doctors took out a few million of his bone marrow cells and managed to insert a healthy gene in them. Then they put them back – a single, simple infusion of 20 to 30 millilitres of fluid. In every person's bone marrow there is a group of cells known as 'stem' cells. When they receive the right chemical signals, they multiply to become red and white blood cells. It took half an hour to give the boy what they hope will be a lifetime of normal immunity.

Within 15 days, doctors knew from tests that the new gene was working. But the marvel for the parents was watching the change in their sickly, underweight boy. Before their eyes, he began to get better. The ugly red blotches on his skin faded away, his diarrhoea disappeared, he put on weight and his breathing became easier. Three months after the infusion, the boy's astonished parents were told they could take him home. There he remains, a normal, healthy child.

Despite the initial optimism, this first achievement of gene therapy will have to be further proved over time, as it might not be so successful in treating other genetic diseases. Nevertheless, it is a major step forward in gene therapy. Since that first step, treatment of three other children in the Hospital has also turned out well. A fifth boy has done less well, because the disease had already caused serious complications, but the doctors are pressing ahead with further trials, and similar gene therapy is to be carried out in London.

euphoria

Euphoria has often been defined as an “affective state of exaggerated well-being or elation”. Euphoria may also occur with diseases affecting the nervous system.

flaws

Flaws are like the flip side of feats.

We all have *flaws*, but I unfortunately have far more than many.

cracked

Cracking is the process whereby complex organic molecules are broken down.

Cracked was a famous American humor magazine, founded in 1958.

infection

infection relates to invasion of pathogenic microorganisms in a bodily part or tissue.

Over 30 different types of Staphylococci can *infect* humans.

stem

A *stem* is one of two main structural axes of a vascular plant.

The *stem* is normally divided into nodes and internodes.

multiply

Rule of *multiplication*: segregation of the alleles into gametes is like a coin toss.

multiplication (botany) is an increase above the normal number of parts, especially of petals.

marvel

marvel is most often used to denote *strong surprise, astonishment*.

We *marveled* that they walked away unhurt from the car accident.

underweight

The term *underweight* refers to a human who is considered to be under a healthy weight.

A number of *underweight* people are fit and well, they simply have a slender constitution.

blotches

Genetic predisposition and autoimmune diseases are the major causes of *blotches* on skin.

Look, my pen leaked and *blotched* my shirt pocket!

fade away

fade away means to become weaker, to dissolve, to fade out.

As they went *away* from us the sound of their voices gradually *faded out*.

diarrhoea/diarrhea

Diarrhoea is the passage of three or more loose or liquid stools per day, or more.

Diarrhoea often goes away without treatment after a few days.

infusion

Economies of many countries are in need of regular capital *infusions* today.

infusion refers to the therapeutic introduction of fluid other than blood into a vein.

optimism

Optimism psychology is in the field of cognitive science, it is not magic.

optimism can be understood as positive thinking, the state of having hopefulness.

complications

Complication, in medicine, is an unfavorable evolution of a disease.

Alcoholism is a common disorder that leads to significant *medical complications*.

- **Give your own examples using:** *transformation, airtight, airtight bubble, code, repair, admit, admitted to hospital, inherited, insert, deadly.*

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Test 1

ACH DRUG INTAKE AND DELIRIUM

- 1 We know that ___ patients frequently use ACH drugs.
A older
B elderly
C oldest
D elders
- 2 They are expected to be particularly ___ to central ACH side-effects.
A sensible
B saturated
C sensitive
D received
- 3 Of course, ___ studies are needed to unequivocally prove the link.
A further
B farthest
C faraway
D furthest
- 4 Can you tell us what ACH drugs are, ___ the first place?
A on
B in
C at
D from
- 5 ACH drugs are strongly ___ to have negative effects on cognition.
A susceptible
B suspicious
C suspected
D suspecting
- 6 Cautious attitude suggests that ___ should be aware of ACH properties of drugs.
A physicists
B pacemakers
C proprietors
D physicians
- 7 What does the abbreviation ACH stand ___? Can you guess?
A at
B on
C for
D about
- 8 Quite naturally, there are ___ methodological differences among these numerous studies.
A considerable
B considerate
C connected
D consequence
- 9 Numerous factors can ___, precipitate or perpetuate development of delirium.
A project
B predispose
C prevent
D prolong
- 10 Most studies have found that ACH drugs may be a ___ risk factor.
A constant
B correlating
C contained
D common
- 11 They can be a risk factor for precipitating delirium in ___ patients.
A sustained
B susceptible
C spontaneous
D situated
- 12 The association between ACH drug ___ and delirium can perhaps be explained.
A information
B incision
C intersection
D intake
- 13 This association seems to have a high biological ____ .
A penetration
B plausibility
C penalty
D practice
- 14 The theory says that a central cholinergic ___ is to blame for delirium onset.
A improvement
B deficit
C support
D inclusion

- 15 The truth is that ACH drugs are frequently ___ in the elderly.
 A prescription
 B prescribed
 C proscribed
 D postponed
- 16 They should at least replace such drugs with ___ that have less anticholinergic properties.
 A this
 B them
 C those
 D the one
- 17 Attention should be paid, especially in those particularly ___ to ACH drug side-effects.
 A present
 B proved
 C patient
 D prone
- 18 Delirium, unfortunately, is a relatively ___ disorder.
 A playful
 B common
 C correct
 D commercial
- 19 In older people with physical ___, delirium has a high morbidity and mortality.
 A influenza
 B influence
 C illness
 D impact
- 20 Identifying ___ factors for delirium is of great importance for the effective prevention.
 A risk
 B risky
 C risked
 D prevented
- 21 The sad truth is that it is often under-recognized and ____ .
 A rated
 B under-treated
 C understood
 D underlined
- 22 An increasing number of ___ have examined the risk factors of delirium in recent decades.
 A study
 B studies
 C students
 D statistics
- 23 What is the most widely ___ theory at the moment?
 A inhibited
 B inherited
 C accepted
 D accused
- 24 Delirium represents the clinical manifestation of a diffuse imbalance of ___ neurotransmission.
 A certified
 B certain
 C celebrity
 D cerebral
- 25 Several neurotransmitters are probably ___ in the pathogenesis of delirium.
 A imprisoned
 B impregnated
 C involved
 D imploded
- 26 Any drug ___ with neurotransmission may in fact facilitate delirium onset.
 A intensifying
 B interfering
 C inserting
 D interpreting
- 27 So far, research findings are still rather ____ .
 A contemporary
 B controversial
 C complying
 D constricted
- 28 Most published studies considered ACH drug ___ to be a precipitating factor.
 A usefulness
 B usage
 C use
 D usury
- 29 This is why a ___ on a complete and updated list of ACH drugs is needed.
 A compatibility
 B connection
 C consensus
 D completion
- 30 Such a complete and updated list is needed ___ for clinical and research purposes.
 A basing
 B because
 C but
 D both

Test 2

ACTING THROUGH CHEMICAL MESSENGERS

- 1 The endocrine system functions in the regulation of body ____ .
A advantages
B action
C actions
D activities
- 2 The endocrine system does this along with the ____ system.
A nervous
B nerve
C neuron
D nerves
- 3 Electrical ____ and neurotransmitters cause muscle contraction.
A impressions
B impression
C impulses
D impulse
- 4 This effect is of short duration – it is measured ____ seconds.
A by
B at
C with
D in
- 5 The endocrine system acts ____ chemical messengers.
A through
B by
C with
D from
- 6 These chemical messengers ____ hormones.
A are called
B called
C act
D call
- 7 We know that hormones influence ____, development, and metabolism.
A growth
B care
C growing
D grew
- 8 The Greek word “krine” means to separate, to ____ .
A channel
B choose
C secrete
D challenge
- 9 The secretory ____ of endocrine glands are called hormones.
A prospects
B proposals
C production
D products
- 10 Hormones are secreted directly ____ the blood.
A in
B into
C at
D from
- 11 After reaching the blood, they are carried ____ the body.
A into
B to
C through
D throughout
- 12 Hormones influence only those cells that have the corresponding receptor ____ .
A sights
B sites
C cites
D sides
- 13 Hormones are chemical substances that ____ metabolism.
A treat
B penetrate
C regulated
D regulate
- 14 They are also very important for ____ .
A contraction
B proposition
C production
D reproduction

- 15 The action of the endocrine system is ___ in minutes, hours, or weeks.
 A most
 B made
 C minimum
 D measured
- 16 The action of the endocrine system is ___ than that of the nervous system.
 A more generalized
 B general
 C generalized
 D most generalized
- 17 There are two ___ categories of glands in the body.
 A mayor
 B major
 C maximum
 D majors
- 18 Exocrine glands have ducts that carry their ___ product to a surface.
 A severe
 B secret
 C expectancy
 D secretory
- 19 Among these glands there are also the ___ that secrete digestive enzymes.
 A ones
 B gland
 C one
 D such
- 20 Endocrine glands ___ have ducts to carry their product to a surface.
 A does not
 B do
 C do not
 D not
- 21 This is exactly why the endocrine glands are called ___ glands.
 A different
 B difficult
 C duct
 D ductless
- 22 The word *endocrine* is ___ from the Greek terms "endo" and "krine".
 A described
 B determined
 C executed
 D derived
- 23 Some hormones ___ certain tissues and organs specifically.
 A affect
 B in effect
 C effect
 D implant
- 24 This is why they travel only short ____ .
 A distant
 B distances
 C relatives
 D disciplines
- 25 Other hormones are transported in the blood ___ to all parts of the body.
 A stream
 B suspense
 C treatment
 D station
- 26 The organs affected by hormones are called ____ .
 A internal organs
 B the hormones
 C the organs
 D target organs
- 27 Chemically, hormones ___ into two main categories.
 A fits
 B fail
 C fit
 D fall
- 28 These two main categories are *amino acid* ____, and *steroids*.
 A compounds
 B complex
 C products
 D complexion
- 29 Steroids hormones are produced by the adrenal cortex and the ___ glands.
 A several
 B sexuality
 C sexual
 D sex
- 30 Progesterone, testosterone, etc., are examples of ___ hormones.
 A such
 B that
 C this
 D ones

Test 3

ALL THE UNPLEASANTNESS HAD GONE...

- 1 As the days passed, I just could not get better beyond a certain ____ .
A place
B palace
C point
D pointer
- 2 Colin simply had to ____ the dose of the dwindling store of antibiotics.
A replace
B retake
C undertake
D reduce
- 3 Every time he did that, my stomach would swell ____ in taut protest.
A on
B up
C about
D in
- 4 He had to ____ the supply in the emergency barrel.
A rise
B ride
C raid
D read
- 5 I seemed a ____ of the fit woman of only a week ago.
A trick
B traverse
C trade
D travesty
- 6 My skin was all shiny and ____ from stretching suddenly.
A held
B hurled
C high
D hurt
- 7 It was almost impossible for me ____ my bladder.
A to emphasize
B emptied
C emptying
D to empty
- 8 The doctor told me in ____ English to relax.
A broken
B braking
C brought
D bright
- 9 I had to relax because he wanted to make a ____ examination.
A taking
B trying
C thorough
D thoroughly
- 10 Then a smiling nurse came in with an injection served on a silver ____ .
A salver
B salvation
C solution
D plate
- 11 In a few minutes I began to feel pleasantly ____ .
A smiling
B easy
C dizzy
D noisy
- 12 Then the nurse dressed me in a surgical ____ .
A gown
B dress
C trousers
D towel
- 13 What she dressed me ____ felt finer than any clothes I had of my own.
A to
B of
C in
D at
- 14 They wheeled me briskly down in a trolley to the operating ____ .
A entrance
B hall
C theatre
D cinema

- 15 Dimly I realized what the problem really ____ .
 A exclude
 B include
 C was
 D is
- 16 If I were ashore, this would ____ going to hospital urgently.
 A make
 B meant
 C meaning
 D mean
- 17 In other words, my condition required blood ____ and a few days in hospital.
 A transfusion
 B treatment
 C transplant
 D transplantation
- 18 Two hours later I was ____ on my back on a cool high bed.
 A lay
 B lied
 C lying
 D laying
- 19 The doctor seemed pleased when he ____ our son's name.
 A received
 B loved
 C liked
 D learned
- 20 Yes, the truth was we had named our son ____ him.
 A against
 B after
 C afterwards
 D about
- 21 The nurses rushed ____ taking my temperature.
 A round
 B always
 C around
 D after
- 22 They also ____ my blood pressure several times.
 A tried
 B made
 C took
 D executed
- 23 I woke up back in my room ____ the sound of torrential tropical rain.
 A about
 B in
 C into
 D to
- 24 The rain was crashing ____ from the huge green leaves.
 A down
 B downstairs
 C up
 D upwards
- 25 The huge green leaves ____ outside my window.
 A held
 B hanging
 C hanged
 D hung
- 26 She washed me with cotton wool held by a long pair of ____ .
 A tongues
 B knife
 C tongs
 D things
- 27 Then another nurse came in and ____ me an injection.
 A asked
 B tried
 C gave
 D made
- 28 The trouble I had had at sea had been a ____ .
 A misunderstanding
 B miracle
 C mistake
 D miscarriage
- 29 I could have ____ if we had continued on to England without stopping.
 A dead
 B dying
 C death
 D died
- 30 I really ____ with the thousands of other women who have these problems.
 A sympathized
 B sympathetic
 C sympathy
 D sympathies

Test 4

ANAESTHESIA

- 1 The word *anaesthesia* was first used ___ Oliver Wendell Holmes, Sr. in 1846.
A by
B from
C with
D from the
- 2 The word *anaesthesia* is based on Greek words ___ "lack of sensation".
A getting
B meaning
C going
D stating
- 3 *Anaesthetics* cause reversible depression of the normal ___ of practically all cells.
A application
B actions
C action
D activities
- 4 *Anaesthetics* must be used in ___ concentrations, of course.
A suitable
B complete
C certainly
D carefully
- 5 The mode of action of anaesthetics is still a matter ___ debate.
A to
B of
C from
D in
- 6 The thermodynamic activity is almost the same thing as the ___ saturation.
A percent
B percentage
C per cent
D proportion
- 7 This activity is the same in all parts of a ___ mixture under conditions of equilibrium.
A complicated
B complex
C complexity
D certified
- 8 The active anaesthetics are usually very ___ in lipoids.
A soluble
B solved
C resolved
D rare
- 9 What do you think the possible ___ is?
A explaining
B explain
C effort
D explanation
- 10 It is suggested that their action is due to ___ in the lipoids of the cells.
A accumulate
B accumulation
C accumulates
D action
- 11 When tissues are anaesthetized they lose ____ .
A weigh
B white
C wait
D weight
- 12 What really ___ when tissues are anaesthetized?
A happened
B happens
C happening
D hopes
- 13 This has been attributed to a fall in the ___ of their colloids for water.
A attraction
B attention
C effort
D affinity
- 14 This is put forward as the ___ change in anaesthesia.
A finding
B founding
C funding
D fundamental

- 15 A given anaesthetic ___ can be produced by different substances.
 A effective
 B effect
 C effort
 D affect
- 16 This, of course, happens at about the same level of ___ activity.
 A temperature
 B thermometer
 C thermodynamic
 D thermal
- 17 Under such ___, most of the differences between different anaesthetics disappear.
 A curriculum
 B circumstance
 C condition
 D circumstances
- 18 What does the pharmacological activity depend ___?
 A about
 B on
 C of
 D at
- 19 What ___ is the amount of anaesthetic to be used to get a given effect.
 A works
 B makes
 C matters
 D manners
- 20 Substances with a high boiling ___ are likely to be particularly active as vapours.
 A point
 B place
 C position
 D plate
- 21 What about substances which are not very ___ in water?
 A difficult
 B soluble
 C difference
 D saved
- 22 It follows from this that they are likely to be particularly active when ___ to water.
 A aided
 B added
 C addition
 D arranged
- 23 Is it true that anaesthetics ___ cells easily?
 A perform
 B inhibit
 C penetrate
 D pretend
- 24 Anaesthetics have been ___ to cause changes in viscosity in the cells' interior.
 A preserved
 B observed
 C obtained
 D reserved
- 25 Anaesthesia, however, is not produced by the injection of ___ inside cells.
 A allergic
 B allergy
 C anaesthetics
 D anaesthesia
- 26 It is probably due to an ___ on the plasma membrane.
 A effects
 B effective
 C affect
 D effect
- 27 The word is of the membrane which bounds the cell and is rich ___ lipoids.
 A of
 B by
 C at
 D in
- 28 Anaesthetics usually ___ the oxygen uptake of tissues.
 A drive
 B press
 C depress
 D deform
- 29 It has been suggested that this effect is the ___ of anaesthesia.
 A case
 B casing
 C cause
 D form
- 30 Brain is particularly ___ on carbohydrate metabolism.
 A deformed
 B dependent
 C dependant
 D derived

Test 5

**ANTIOXIDANTS COULD BE DOING
MORE HARM THAN GOOD**

- 1 Antioxidants are specific substances or ___ in our food.
A nutrients
B nitrates
C nitrogen
D nuts
- 2 They can prevent or slow the oxidative ___ to our body.
A indemnification
B damages
C damage
D debt
- 3 When our body cells ___ oxygen, they naturally produce free radicals.
A make
B accept
C produce
D use
- 4 Free radicals are exactly the by-products which can ___ harm.
A invent
B produce
C combine
D protect
- 5 Antioxidants act as "free radical ___".
A scouts
B scavengers
C suspects
D service
- 6 Antioxidants in fact prevent and ___ what has been done by these free radicals.
A present
B prepare
C repair
D review
- 7 Antioxidants may also ___ immune defense and lower the risk of cancer and infection.
A embody
B enhance
C enter
D effect
- 8 These destructive groups of atoms cause other atoms to ___ electrons.
A lose
B loose
C lost
D lease
- 9 Can you describe the ___ known as oxidative stress?
A process
B procedure
C performance
D position
- 10 Many serious disorders are wholly or partly blamed ___ free radicals.
A from
B to
C about
D on
- 11 Such disorders ___ from heart disease to cancer.
A range
B raid
C report
D raise
- 12 However, scientists believe now that there is a flip ___ to the coin.
A space
B pride
C size
D side
- 13 They say that high levels of antioxidants could make atoms ___ electrons.
A gain
B guide
C guard
D grasp
- 14 This "reductive ___" causes untold damage.
A stop
B stress
C support
D inclusion

- 15 Many different health problems are ___ by oxidative damage.
 A contributed
 B copied
 C cleared
 D certified
- 16 What are the most ___ known antioxidants?
 A actively
 B strictly
 C commonly
 D certainly
- 17 So, how could antioxidants be doing more ___ than good?
 A harmless
 B harmful
 C harm
 D health
- 18 A study claims that antioxidant ___ could be very dangerous.
 A overweight
 B overload
 C underweight
 D offer
- 19 It can be behind diseases such as ___ heart problems.
 A imploded
 B inherited
 C inheritance
 D improper
- 20 These ___ are mostly found in fruit and vegetables.
 A compounds
 B connections
 C component
 D contrasts
- 21 Until recently, they have been ___ as beneficial to our health.
 A lauded
 B loaded
 C uploaded
 D founded
- 22 It is known, of course, that they ___ free radicals.
 A pulverize
 B neutralise
 C advertise
 D perform
- 23 What were the US researchers ___ this time?
 A staying
 B studying
 C standing
 D hopping
- 24 The mice were carrying a human mutation linked to ___ skeletal and heart muscle.
 A liked
 B worked
 C worrying
 D weakened
- 25 The mice developed similar symptoms to those seen ___ human patients.
 A for
 B on
 C in
 D at
- 26 The scientists suspected that oxidative stress levels were ____ .
 A irresponsible
 B responsible
 C respected
 D unprotected
- 27 Something interesting happened, ___ their surprise.
 A to
 B on
 C at
 D about
- 28 The mutant mice were producing ___ amounts of a natural antioxidant.
 A external
 B excellent
 C excess
 D creative
- 29 This study explains the ___ that reductive stress can play in disease.
 A place
 B role
 C rate
 D form
- 30 The doctors believe that there may be ___ for human neurodegenerative diseases.
 A collections
 B collisions
 C complications
 D implications

Test 6

**AREA EQUAL TO ONE SIDE
OF A TENNIS COURT!**

- 1 The human lungs are the organs of ____ in humans.
A respiration
B perspiration
C perspective
D aspiration
- 2 Is one side of a tennis court a ____ area?
A hidden
B large
C forbidden
D largest
- 3 Humans have two lungs, with the left being divided into two ____ .
A balls
B sides
C poles
D lobes
- 4 Together, the lungs contain approximately 2,400 km of ____ .
A airways
B stairways
C air
D sideways
- 5 We know that the lungs also contain 300 to 500 million ____ .
A alveoli
B alveolar
C alveolus
D all ways
- 6 Their total ____ area is about 70 square metres in adults.
A surface
B surrounding
C surrender
D interface
- 7 This is ____ the same area as one side of a tennis court.
A roughly
B carefully
C rough
D eventually
- 8 The conducting zone ____ the air to 37 degrees Celsius.
A channels
B warns
C warms
D wears
- 9 And can you tell us where the air is ____?
A heater
B humidify
C watered
D humidified
- 10 This zone also cleanses the area by ____ particles.
A restructuring
B removing
C relating
D repeating
- 11 That task belongs to cilia ____ on the walls of all the passageways.
A implanted
B introduced
C implemented
D located
- 12 The lungs are surrounded by the rib ____ .
A cave
B care
C cage
D case
- 13 The respiratory zone is the ____ of gas exchange with blood.
A site
B side
C sight
D tight
- 14 The sympathetic nervous system ____ bronchodilation.
A causes
B proposes
C cases
D casts

- 15 If all the capillaries were unwound, they would ___ for about 992 km!
 A exclude
 B extension
 C exemplify
 D extend
- 16 The word is, of course, of the capillaries ___ the alveoli.
 A surrounding
 B swaying
 C standing
 D concerning
- 17 What is the approximate ___ of one lung? Do you know the answer?
 A way
 B weight
 C whale
 D wait
- 18 Each lung weighs 1.1 kilograms, the ___ organ about 2.3 kilograms – approx. 5 pounds.
 A expert
 B enforced
 C enable
 D entire
- 19 What is the difference between the bronchioles and the ___ bronchioles?
 A terminal
 B thermal
 C trial
 D trendy
- 20 The conducting zone has no gas ___ with the blood.
 A explanation
 B exploitation
 C exchange
 D express
- 21 The conducting zone is ___ with cartilage.
 A recorded
 B forced
 C different
 D reinforced
- 22 The cartilage is necessary in order to ___ open the airways.
 A stay
 B stand
 C have
 D hold
- 23 The system does this via noradrenaline acting on the beta ____ .
 A receptors
 B perception
 C receivers
 D revolvers
- 24 The parasympathetic nervous system ___ via acetylcholine.
 A acquires
 B acts
 C applies
 D assists
- 25 This system maintains the resting ___ of the bronchiolar smooth muscle.
 A tone
 B time
 C treatment
 D trade
- 26 Many other stimuli are ___ in the regulation process.
 A involved
 B inside
 C inherited
 D improved
- 27 The lungs are ___ by the visceral pleura.
 A lined
 B closed
 C opened
 D left
- 28 Diseases of the human lung belong to ___ diseases.
 A respiratory
 B retained
 C pretended
 D creative
- 29 Many of such diseases are caused or ___ by smoking, of course.
 A worse
 B weakened
 C worsened
 D wasted
- 30 Lung disorders are generally ___ by general practitioners.
 A handed
 B handled
 C headed
 D heated

Test 7

A BIG GLOBAL PUBLIC HEALTH PROBLEM

- 1 Cervical cancer ___ an important global public health problem.
A reacts
B represents
C receives
D rewrites
- 2 We can say that because it is a ___ cause of death in women.
A common
B complete
C courageous
D coronary
- 3 Today scientists know what causes this terrible ____ .
A doctor
B pension
C condition
D correction
- 4 Cervical cancer is attributable to human papillomavirus (HPV) ____ .
A reaction
B infection
C interaction
D combination
- 5 Can you ___ what the so-called Pap smear is?
A explain
B execute
C excuse
D effect
- 6 The Pap smear has been ___hailed as a landmark achievement of cancer prevention.
A appropriately
B approximately
C alternatively
D allegedly
- 7 Its ability to detect cellular abnormalities is really ____ .
A remarkable
B relative
C referential
D represented
- 8 False-negative results lead to the need for ___ screening at relatively short intervals.
A connect
B previous
C repeat
D cardinal
- 9 The screening ___ beyond the economic resources of nations in the developing world.
A retains
B remains
C reveals
D relieves
- 10 This is why the cervical cancer incidence in the developing world has ___ high.
A reported
B represented
C remanded
D remained
- 11 The same, unfortunately, applies to ___ rates in the developing nations.
A morality
B mortality
C moral
D mortal
- 12 Large reductions in these rates are ___ primarily to the industrialized world.
A lost
B lowered
C left
D limited
- 13 Consequently, about 80 per cent of cervical cancers now ___ in developing nations.
A obtain
B occur
C occupy
D organize
- 14 In such countries it is frequently the most usual cause of death from cancer ___ women.
A at
B in
C off
D from

- 15 This ability has resulted in the reduction of incidence and ___ from cervical cancer.
 A quality
 B mortality
 C quantity
 D abnormality
- 16 The said ___ led to a greater emphasis being given to prevention of this cancer.
 A advance
 B condition
 C procedures
 D articles
- 17 Yes, but what have been the ___ to this success?
 A development
 B understanding
 C story
 D keys
- 18 These have ___ the role of high-grade dysplasia and its cytological counterpart.
 A infected
 B included
 C inserted
 D contracted
- 19 It has been recognized that they represent the main ___ to invasive cervical cancer.
 A precursor
 B preposition
 C proposition
 D proposal
- 20 Regular Pap smear screening can ___ most of these pre-cancerous lesions.
 A introduce
 B indemnify
 C identify
 D ignore
- 21 The timely treatment of these lesions can effectively ___ them.
 A catch
 B cure
 C differ
 D construct
- 22 Despite the success, there ___ two limitations of the Pap smear.
 A explain
 B exist
 C executes
 D persists
- 23 The reduction of cervical cancer in developing nations remains an ___ need of high priority.
 A unmet
 B unseen
 C uninteresting
 D infrequent
- 24 In ___ to the Pap smear, there is another pioneering achievement.
 A advancement
 B advance
 C attention
 D addition
- 25 All cases of cervical cancer are attributable to infection by a ___ of HPVs.
 A subset
 B allergy
 C pole
 D treatment
- 26 The link to HPV was initially suggested from ___ analysis of cervical lesions.
 A historic
 B histologic
 C historical
 D pathology
- 27 This hypothesis was given a firm molecular ____ .
 A bases
 B basis
 C base
 D basic
- 28 HPV infection is the primary cause of ___ 100% of cervical cancers.
 A close to
 B close
 C closing
 D closing at
- 29 Research provided ___ into basic aspects of HPV.
 A insight
 B information
 C guides
 D interest
- 30 Also important is the role of HPV in other ___ tumors.
 A general
 B genuine
 C genial
 D genital

Test 8

THE BODY ACHED DULLY...

- 1 You are about to ___ when you dream that you are dreaming.
A wake
B awake
C awaken
D awakened
- 2 He was permanently in this ___ for the next two days.
A standing
B stations
C statement
D state
- 3 He never for a moment regained ___ during the next two days.
A conscience
B consciousness
C conscientious
D conscious
- 4 The procession of his dreams ___ by without his effort to disturb their sequence.
A running
B competed
C went
D was
- 5 Many of these dreams were really ___, and all were painful.
A tenderness
B terrorist
C terrified
D terrifying
- 6 He knew that he was in a bed and that he was ___ on his back.
A letting
B liking
C laying
D lying
- 7 Of course, he also knew that he ___ not move.
A has to
B must
C can
D could
- 8 The rest of his body ached dully as if he had been ___ all over.
A bit
B beaten
C beat
D beet
- 9 His unshaven neck and chin prickled ___ the sheets.
A from
B about
C against
D after
- 10 He knew that he must have been at least three days without ____ .
A shaving
B saving
C saying
D shedding
- 11 At that moment the door opened and the doctor came in ___ by a nurse.
A inherited
B forgetting
C followed
D following
- 12 You know, I have been sent ___ from England to look after you!
A over
B about
C away
D after
- 13 Your ___ are serious, but your life is not in danger!
A injury
B inventions
C injuries
D injured
- 14 Well, yes, the truth is that you have ___ a lot of blood.
A lose
B loosed
C lost
D loser

- 15 In one of his twilight moments
he thought there were people round ____ .
A from him
B himself
C him
D to him
- 16 He made no ____ , however,
to open his eyes and reenter the world.
A affection
B effortless
C effect
D effort
- 17 When he awoke again
some hours later all his ____ had gone.
A terrifying
B horrified
C terrors
D terrified
- 18 Yes, all of a sudden he felt
really ____ and languorous.
A worn
B warn
C warm
D warmth
- 19 He closed his eyes
and mentally ____ his body
A excluded
B explained
C exploded
D explored
- 20 The worst pain was in his wrists
and ____ and in his right hand.
A uncles
B ankles
C uncle
D articles
- 21 In other words, he felt pain
everywhere ____ they had cut him.
A weather
B why
C where
D whether
- 22 He ____ that he had been given
a local anaesthetic.
A thickened
B proposed
C assumed
D persisted
- 23 If all goes well,
you will ____ completely!
A restore
B report
C receive
D recover
- 24 None of the functions of your body
will be ____ , I sincerely hope.
A impaired
B implemented
C repaired
D imploded
- 25 It will be my endeavour to give
you as much ____ as possible.
A comfortably
B hospital
C connection
D comfort
- 26 When you sleep – the nurse
has orders to ____ your arms again.
A surrender
B ensure
C secure
D safe
- 27 Above all, it is important that
you rest and regain your ____ .
A strong
B string
C strength
D breadth
- 28 For how long were you
maltreated, do you have any ____ ?
A ideals
B ideas
C intention
D idea
- 29 ____ his mind back to the scene
awoke the whole nightmare again.
A Confirming
B Carrying
C Creating
D Casting
- 30 Again, a deep ____ of pain
started up in his body.
A throb
B knob
C slob
D state

Test 9

THE BODY'S LARGEST ORGAN

- 1 We all know that the skin is the ___ covering of the body.
A former
B outer
C onset
D free
- 2 In humans, the skin is the largest organ of the ___ system.
A integrated
B integumentary
C internal
D informal
- 3 We have learned that the skin has ___ layers of ectodermal tissue.
A master
B more
C multiple
D much
- 4 Our skin ___ the underlying muscles, bones, ligaments, and internal organs.
A guards
B completes
C combines
D cares
- 5 Human skin is ___ to that of most other mammals.
A certain
B broad
C similar
D tighter
- 6 The difference certainly is in that it is not protected by a ____ .
A part
B pelt
C path
D felt
- 7 The adjective *cutaneous* ___ means "of the skin".
A carefully
B library
C literally
D literary
- 8 In humans, skin pigmentation can ___ from dry to oily.
A retain
B resist
C rate
D range
- 9 Such skin variety provides a rich and diverse ___ for bacteria.
A habitat
B habit
C habits
D happening
- 10 The skin melanin is ___ by melanocytes.
A preferred
B pretended
C provided
D divided
- 11 Melanocytes ___ some of the potentially dangerous ultraviolet radiation in sunlight.
A implement
B adhere
C absorb
D intact
- 12 The skin also ___ DNA-repair enzymes that help reverse UV damage.
A ceases
B confirms
C contains
D connects
- 13 People who ___ the genes for these enzymes suffer high rates of skin cancer.
A lack
B save
C exclude
D lean
- 14 Malignant melanoma, produced by UV light, is particularly ____ .
A invasive
B improved
C supported
D informal

- 15 The adjective *cutaneous* comes ___ the Latin noun *cutis*, skin.
 A from
 B by
 C in
 D of
- 16 The skin, of course, ___ with the environment.
 A instructs
 B implements
 C interfaces
 D interferes
- 17 Our skin protects the body against pathogens and ___ water loss.
 A expressive
 B extorted
 C excessive
 D expressed
- 18 Its other functions ___ insulation, temperature regulation, sensation, ...
 A insert
 B include
 C intensify
 D invert
- 19 The skin is also responsible for the ___ of vitamin D.
 A supplies
 B synthesis
 C surroundings
 D surfaces
- 20 Severely damaged skin will try to ___ by forming scar tissue.
 A hop
 B heap
 C heal
 D heat
- 21 The scar tissue is often ___ and depigmented.
 A discolored
 B distorted
 C difficult
 D distracted
- 22 In humans, skin pigmentation ___ among populations.
 A thickens
 B paints
 C persists
 D varies
- 23 Unfortunately, malignant melanoma spreads quickly, and can often be ____ .
 A inhibited
 B deadly
 C dead
 D deranged
- 24 Human skin pigmentation differs among populations in a striking ____ .
 A maintenance
 B moment
 C manner
 D means
- 25 This has ___ to the classification of people(s) on the basis of skin color.
 A leaded
 B left
 C led
 D lead
- 26 There are at least five different pigments that ___ the color of the skin.
 A defend
 B determine
 C demonstrate
 D deny
- 27 *Oxyhemoglobin* is also ___ in blood and is not a pigment of the skin.
 A found
 B find
 C founded
 D finding
- 28 For the average ___ human, the skin has a surface area of 1.5-2.0 square metres!
 A additional
 B adhesive
 C admirer
 D adult
- 29 The most of the skin is between 2-3 mm (0.10 inch) ____ .
 A thin
 B thick
 C thorough
 D taken
- 30 The average square inch (6.5 cm²) of skin holds as ___ as 650 sweat glands!
 A most
 B more
 C many
 D much

Test 10

CAUSES OF AXON DAMAGE IN MS

- 1 Do you know what the abbreviation *MS* stands ___ in this title?
A from
B for
C of
D about
- 2 What is central ___ the development of therapies for multiple sclerosis?
A into
B onto
C to
D at
- 3 Very important is a precise understanding of the ___ cascade of pathological events.
A territorial
B temptation
C *tempus*
D temporal
- 4 What has, traditionally, been thought to be the ___ event in this disease?
A primary
B prepositional
C provisory
D provided
- 5 What about the acute inflammatory attack ___ myelin?
A to the
B on
C to
D in
- 6 It was assumed that inflammation is the precursor to the ___ history of the disease.
A commonly
B totally
C entire
D entity
- 7 The progression depended on the previous or ___ inflammation.
A moment
B general
C going on
D ongoing
- 8 It is difficult to ___ the environment of the axon throughout its entire length.
A defend
B determine
C devise
D do
- 9 The length of axons ___ for such a difficulty.
A pretends
B plays
C makes
D takes
- 10 Another factor ___ to this difficulty is the complexity of interactions.
A containing
B circling
C colliding
D contributing
- 11 Degeneration of the axon may occur some ___ away from a specific insult.
A definition
B distance
C difference
D determination
- 12 This is what makes ___ between pathological processes difficult
A combinations
B cores
C correlations
D companies
- 13 Epidemiological studies included ___ of patients with the disease.
A contents
B cooperatives
C containers
D cohorts
- 14 Also included were those ___ to specific therapies.
A exposed
B explained
C expressed
D prepared

- 15 The driving dogma has been to prevent relapses by immunosuppressive ____ .
 A therapies
 B therapeutical
 C therapeutists
 D therapeutically
- 16 What has been the importance of the epidemiological data ____ ?
 A preferred
 B presented
 C prescribed
 D prevented
- 17 Such data and other observations have prompted a re-evaluation of this ____ .
 A hypotheses
 B hyphen
 C hypothesis
 D humidity
- 18 It was suggested that a neurodegenerative ____ may be the primary pathological event.
 A procedure
 B pretending
 C prospects
 D process
- 19 Evidence concerning the likely cause of axon loss comes from a variety of ____ .
 A sources
 B resources
 C saucers
 D scissors
- 20 Pathological studies have a certain ____ here.
 A atmosphere
 B attainment
 C advantage
 D attention
- 21 Are pathological studies able to define ____ mechanisms occurring in tissue?
 A protected
 B preferred
 C precise
 D perfect
- 22 However, they only ____ a 'snap-shot' of what may be occurring at a given time.
 A make
 B take
 C took
 D protect
- 23 Of course, such studies ____ precise tissue analysis.
 A lake
 B lack
 C luck
 D lock
- 24 Experimental models are ____ used and may overcome many of these issues.
 A wrong
 B wait
 C widely
 D windy
- 25 The degree to which inflammation ____ axon damage in MS is of great interest.
 A takes
 B treats
 C positions
 D produces
- 26 Studies showed high levels of APP accumulation within acute active ____ .
 A lesions
 B lessons
 C lenses
 D locals
- 27 The abbreviation *APP* ____ for *axonal amyloid precursor protein*.
 A stays
 B stands
 C states
 D stops
- 28 Inflammation ____ is responsible for axonal pathology to a large extent.
 A *per diem*
 B *per cent*
 C *per se*
 D percentage
- 29 What do ____ to correlate inflammation and axonal pathology suggest?
 A acceptance
 B atmosphere
 C alignment
 D attempts
- 30 Such attempts have suggested that this ____ may be too simplistic.
 A formulation
 B form
 C formality
 D former

Test 11

**THE CENTER OF THE HUMAN
NERVOUS SYSTEM**

- 1 The human brain ___ in the cranium.
A is enclosed
B is closed
C closes
D includes
- 2 The human brain has the same ___ structure as that of other mammals.
A genetic
B general
C going
D good
- 3 However, it is ___ three times larger than the brain of a typical mammal.
A much more
B more
C over
D less
- 4 The word is of a typical mammal with an equivalent body ___, of course.
A system
B size
C state
D slice
- 5 Most of the ___ expansion comes from the cerebral cortex.
A state
B sporadic
C spatial
D spade
- 6 Cerebral cortex is a convoluted ___ of neural tissue.
A liar
B lay
C layer
D laid
- 7 This neural tissue covers the ___ of the forebrain.
A care
B preface
C surface
D survey
- 8 Due to evolution, the modern human brain has been ___ !
A shrinking
B choosing
C shining
D sinking
- 9 This has been happening ___ the past 28,000 years.
A around
B from
C after
D over
- 10 The brain continuously receives ___ information.
A sensual
B sensory
C sample
D circular
- 11 It ___ analyzes this data and then responds accordingly.
A tastefully
B ready
C reading
D rapidly
- 12 Of course, the brain responds by controlling ___ actions and functions.
A readily
B bodily
C formerly
D sincerely
- 13 The brain ___ controls breathing and other autonomic processes.
A state
B expand
C stand
D stem
- 14 Autonomic processes are the ___ that are independent of conscious brain functions.
A such
B those
C these
D ones

- 15 The frontal lobes of the human brain are especially ____ .
 A excluded
 B expanded
 C intensified
 D expansive
- 16 They are associated with ____ functions – planning, abstract thought,...
 A export
 B expert
 C executive
 D exceptional
- 17 The portion of the human brain ____ to vision is also greatly enlarged.
 A deemed
 B dependent
 C destroyed
 D devoted
- 18 That portion of the human brain is called the occipital ____ .
 A globe
 B lobe
 C line
 D load
- 19 Brain evolution is marked by a steady ____ in encephalization.
 A invention
 B crest
 C increase
 D creased
- 20 Estimates vary for the number of neuronal and non-neuronal cells ____ in the brain.
 A carried
 B confused
 C contained
 D complicated
- 21 The cells ____ signals to each other, obviously.
 A play
 B pass
 C pretend
 D prefer
- 22 They do it ____ as many as 1,000 trillion synaptic connections.
 A why
 B via
 C when
 D vary
- 23 The neocortex is the center of ____ thinking, learning, and memory.
 A happening
 B orders
 C higher-order
 D ordeal
- 24 The cerebellum is ____ for the body's balance, posture,...
 A reading
 B ready
 C referred
 D responsible
- 25 The human brain is susceptible to many types of ____ and disease.
 A dating
 B dangerous
 C damage
 D damages
- 26 All this – despite the brain's being protected by the ____ bones of the skull.
 A thin
 B thick
 C trial
 D thorough
- 27 Infection of the brain, though serious, is ____ due to the biological barriers which protect it.
 A rude
 B rare
 C raw
 D often
- 28 ____ head injuries such as a blow to the head are very common, unfortunately.
 A Clear
 B Close
 C Closed
 D Careful
- 29 The brain is also susceptible to degenerative ____ .
 A distances
 B distributions
 C disorders
 D dangers
- 30 A number of psychiatric ____ are thought to be associated with brain dysfunctions.
 A combinations
 B connections
 C containers
 D conditions

Test 12

CHILDREN CAN'T HELP GETTING DISTRACTED

- 1 Getting a child to concentrate on just one thing ___ can be impossible.
A at once
B at one
C at a
D one
- 2 Yes, it can be impossible sometimes, any parent ___ that.
A know
B knows
C can
D knowing
- 3 But do you think it is simply because they are being ___ ?
A nausea
B no thing
C naughty
D naught
- 4 If you really think that, you know you ___ be wrong.
A may
B should
C shall
D have to
- 5 What do you know about the ___ the young children's brains work?
A whatever
B way
C weight
D what
- 6 It is impossible for them to ___ other things that come along and attract their attention.
A ignore
B implement
C invest
D imply
- 7 It is only as they get older that their brains are able to tell some parts to ___ off.
A play
B switch
C better
D take
- 8 "Far peripheral" vision ___ at the edges of the field of view.
A expells
B explains
C exists
D extremes
- 9 "Mid-peripheral" vision is in the ___ of the field of view.
A middle
B make
C meddle
D master
- 10 "Near-peripheral" vision is sometimes referred ___ as "para-central" vision.
A too
B about
C to
D after
- 11 Children of four to six had enormous difficulty ___ themselves looking at the other object.
A swaying
B taking
C staking
D stopping
- 12 This time Dr Paul van Donkelaar was the research ____ .
A connection
B former
C leader
D leading
- 13 He said that the problem was much more muted in the ___ to nine-year-olds.
A seven-
B seventh
C seventeen
D seventy
- 14 He believes young children cannot help ___ be distracted.
A too
B on
C to
D but

- 15 This discovery was made by a team ____ University of Oregon
 A at the
 B at
 C at an
 D on the
- 16 Children asked to look at one object often rapidly ____ towards other things.
 A glanced
 B glued
 C glancing
 D wrote
- 17 The researchers took 41 people ____ from four to twenty-nine.
 A aching
 B ages
 C aged
 D advanced
- 18 Each group were given an object to look ____ .
 A at
 B afterwards
 C from
 D abruptly
- 19 After that another item was ____ in their peripheral vision.
 A placed
 B position
 C to play
 D penetrate
- 20 Peripheral vision is a part of vision that occurs outside the very center of ____ .
 A gauze
 B gas
 C gaze
 D guess
- 21 What is included in the ____ of peripheral vision?
 A notion
 B motion
 C potion
 D lotion
- 22 A broad set of non-central ____ in the field of vision is included.
 A points
 B places
 C parts
 D presents
- 23 This is because of the way different parts of the brain ____ with each other.
 A inhibit
 B interact
 C inherit
 D implement
- 24 The frontal cortex controls ____ , movement, and social behaviour.
 A impress
 B import
 C impulses
 D implant
- 25 The brain stem controls the basic ____ of the body.
 A activity
 B allergy
 C actual
 D affection
- 26 Included are eye movement and the ____ of other major organs.
 A function
 B style
 C place
 D friction
- 27 These findings were ____ on August 15, 2006.
 A presented
 B present
 C medication
 D surgical
- 28 The team hopes their discovery could also ____ light on cerebral palsy.
 A shed
 B spend
 C add
 D steal
- 29 In those with the condition, development of the frontal cortex may be ____ .
 A demonstrated
 B delayed
 C determined
 D devastated
- 30 This may help explain why they have problems ____ up objects, for instance.
 A playing
 B picking
 C plastering
 D persuading

Test 13

**CLEANING THE BLOOD
AND REMOVING WASTE PRODUCTS**

- 1 Can you give a ___ answer to what cleans your blood?
A dedicated
B definite
C decide
D devoted
- 2 What about the ___ and processes removing waste products?
A access
B active
C agents
D body
- 3 In osmosis, molecules of ___ move through a semi-permeable membrane.
A system
B safety
C solvent
D sugar
- 4 They move through the membrane to the more ___ solution.
A complete
B concentrated
C connected
D careful
- 5 This is due to the ___ of the molecules compared to the holes in the membrane.
A state
B site
C size
D stand
- 6 The holes ___ the small water molecules through.
A pend
B penetrate
C permit
D pronounce
- 7 Of course, there is a tendency for the molecular concentrations to approach ____ .
A certification
B combination
C equality
D equity
- 8 What is the role of the outer ___ of skin or cuticle in land-dwelling animals?
A circumstance
B covering
C coverage
D chamber
- 9 They are a kind of a ___ to excess water gain or loss.
A definition
B banner
C barrier
D stimuli
- 10 Other mechanisms are also at work, including kidneys, sweating, ____, etc.
A panting
B connecting
C completing
D addition
- 11 In humans, there is a pair of kidneys situated at the back of the ____ .
A navel
B calf
C abdomen
D abundance
- 12 They are responsible ___ cleaning the blood, of course.
A for
B about
C from
D through
- 13 They remove waste products, which are then ____ .
A surrendered
B exclusive
C excreted
D untouched
- 14 The kidney ___ numerous tubules called *nephrons*.
A improves
B predicts
C contains
D invests

- 15 *Osmoregulation* ____ a process in animals.
 A exclude
 B depends
 C describes
 D defends
- 16 This process regulates the ____ of salts and water in the body.
 A distraction
 B symptom
 C connection
 D concentration
- 17 There is always a tendency for water ____ into/out of the body by osmosis.
 A to pass
 B passing
 C underlining
 D to position
- 18 The concentration of salts ____ a fresh water animal is higher than that outside.
 A from
 B without
 C within
 D herein
- 19 Animals have a ____ of structures to rid the body of excess water.
 A variable
 B water
 C varying
 D variety
- 20 What happens in marine animals when the concentration of salts in the ____ is higher?
 A exercises
 B surrounding environment
 C surroundings
 D environments
- 21 What is the ____ of kidneys in vertebrate animals?
 A reading
 B rating
 C role
 D rate
- 22 What are the ____ osmoregulatory organs in vertebrate animals?
 A maintenance
 B mating
 C main
 D mate
- 23 The final looped portion ____ the distal convoluted tubule.
 A are called
 B is contained
 C is called
 D calls
- 24 Blood enters the Bowman's capsules from ____ capillaries which form a knot.
 A tin
 B stain
 C pin
 D tiny
- 25 This blood is brought to the kidney by the ____ artery.
 A secondary
 B penal
 C renal
 D treated
- 26 Water and waste substances ____ along the length of the nephrons.
 A past
 B pass
 C pretend
 D protect
- 27 Useful substances, including water and ____ are reabsorbed.
 A syringes
 B salts
 C knees
 D tendons
- 28 The cleaned or filtered blood ____ leaves the kidney in the vein.
 A before
 B often
 C eventually
 D frequently
- 29 The waste products which have not been reabsorbed are ____ into a collecting duct.
 A intruded
 B exemplified
 C emptied
 D formed
- 30 The ____ which is left enters a narrow tube leading to the bladder.
 A size
 B treatment
 C lotion
 D liquid

Test 14

CLOSELY ALIGNED WITH W.H.O.

- 1 Do you know what the ___ WHO stands for?
A appliance
B complication
C accommodation
D abbreviation
- 2 What can you tell us about the UNICEF procurement ___ ?
A services
B seasons
C sides
D citation
- 3 They provide a broad approach ___ management, building on national capacities.
A wear
B supply
C to supply
D swarm
- 4 This approach includes technical ___, management services, etc.
A acquisition
B aspirations
C persistents
D assistance
- 5 And what is the central ___ of this service?
A objective
B object
C offer
D odour
- 6 Development partners ___ in the procurement of quality vaccines.
A are assisted
B assistance
C affect
D to participate
- 7 Vaccines are expected to be ___, and to come from reliable manufacturers.
A affordable
B affected
C understood
D arranged
- 8 Procurement services are also provided for philanthropic ___ and universities.
A characters
B choices
C certainty
D organizations
- 9 Services are not provided to individuals or profit-making ___.
A entities
B managers
C doctors
D nurses
- 10 UNICEF ensures that vaccines are financed adequately in the countries ___ them.
A referring
B representing
C receiving
D recovering
- 11 GAVI stands for: Global Alliance for Vaccines and ___.
A Immunization
B Imports
C Implications
D Inheritance
- 12 UNICEF'S Supply Division ___ the procurement of vaccines.
A applies
B gives
C oversees
D supplies
- 13 This Division ___ many future challenges.
A faces
B treats
C cures
D forgets
- 14 One of such is the growing divergence of vaccines used in ___ and developing countries.
A industrialized
B industry
C invested
D import

- 15 In all this, UNICEF is one of the ___ partners.
 A donor
 B date
 C determination
 D debtor
- 16 UNICEF provides ___ procurement services for low-income countries.
 A co-ordination
 B critical
 C connective
 D careful
- 17 The Organization helps low-income countries, ___ primarily on Africa and Asia.
 A frustrating
 B focusing
 C fighting
 D founding
- 18 We know that PAHO stands for: Pan American ___ Organization.
 A Health
 B Home
 C Hope
 D History
- 19 UNICEF and PAHO are the two United Nations procurement ___ for vaccines.
 A alterations
 B agencies
 C assignment
 D agency
- 20 They share similar interests and ___ with their respective supply chains.
 A chains
 B checks
 C challenges
 D charges
- 21 In 2006, for instance, UNICEF procured vaccines for 40% of the ___ children.
 A world's
 B world
 C worlds
 D wording
- 22 UNICEF is closely aligned with WHO and its ___ initiatives.
 A global
 B gold
 C goods
 D gains
- 23 UNICEF is one of the partners working to secure the ___ of vaccines for children.
 A finances
 B financing
 C friends
 D foremost
- 24 One problem is the unpredictability of ___ funding.
 A expressed
 B external
 C impress
 D implicit
- 25 Vaccine supply ___ to the poorest countries is the most challenging to maintain.
 A chain
 B chance
 C change
 D choice
- 26 What to say about the need to guarantee vaccine ___ !
 A surrounding
 B system
 C safe
 D safety
- 27 It is also extremely important to guarantee good injection ___ .
 A practices
 B practises
 C practise
 D practical
- 28 To that end, UNICEF has been promoting auto-disable ___ .
 A syringes
 B plate
 C needle
 D gauze
- 29 Also promoted are the so-called pre-filled auto-disable injection ___ .
 A devises
 B devices
 C tablets
 D pills
- 30 Do you understand the ___ of the text and this test now?
 A trade
 B title
 C tend
 D brand

Test 15

**COMMUNICATING WITH ONE ANOTHER
ACROSS A GAP...**

- 1 Nervous system is a network of ___ cells and tissues.
A specialised
B surrounding
C specialty
D speciality
- 2 This system is present in all multicellular animals to a greater or ___ degree.
A least
B lost
C lesser
D last
- 3 Of course, there is one ___ – that of sponges.
A exclusion
B expert
C expectation
D exception
- 4 The activity of the nervous system consists of electrical ____ .
A impressions
B impulses
C combinations
D care
- 5 These are caused by the ___ of sodium and potassium ions.
A mood
B movement
C making
D demonstration
- 6 The nervous system includes receptors, which are called ____ .
A serum
B sentimental
C sensory
D sensible
- 7 They receive information from the ___ environment.
A sure
B surrounding
C round
D surround
- 8 Within the central nervous system all the information is ____ .
A decoded
B determined
C destroyed
D deemed
- 9 After that, a response ____, if appropriate.
A is initiated
B initiate
C installed
D is interpreted
- 10 This often consists of a signal being sent ____ along a nerve.
A around
B round
C outwards
D about
- 11 The signal then travels along a nerve called a ____ nerve.
A mounted
B motor
C cycling
D tactful
- 12 The signal travels to a muscle, causing a ____ to occur.
A condition
B connection
C contraction
D compact
- 13 What is a part of the nervous system concerned ____ in vertebrates?
A with
B at
C away
D from
- 14 What about the control of the ____ or smooth muscle of the body?
A improved
B involuntary
C special
D insecure

- 15 The receptors are concerned with the ____ such as sight, sound, touch and pressure.
 A spaces
 B senses
 C sides
 D singles
- 16 They transmit the information which they ____ along nerves.
 A arrest
 B detect
 C destroy
 D affect
- 17 The projection running out from the neuron cell ____ is called an axon.
 A bright
 B band
 C bond
 D body
- 18 The information then ____ to the central nervous system.
 A travel
 B effect
 C expect
 D take
- 19 What about the ____ animals, such as invertebrates?
 A system
 B certain
 C simpler
 D similar
- 20 Their swellings along the length of a ____ nerve cord are called *ganglia*.
 A singles
 B exploited
 C port
 D paired
- 21 The central nervous system is highly ____ in vertebrate animals.
 A difficult
 B complex
 C hard
 D certified
- 22 In vertebrate animals it consists of the brain and the spinal ____ .
 A cord
 B core
 C cork
 D board
- 23 This is called the ____ nervous system.
 A inhibited
 B autonomic
 C intransitive
 D automated
- 24 The two ____, the sympathetic and parasympathetic, are antagonistic.
 A deviations
 B provisions
 C divisions
 D divide
- 25 They are antagonistic, which means that they act in ____ ways.
 A supported
 B oriented
 C opposite
 D positioned
- 26 Its activity regulates the ____ environment of the body.
 A internal
 B intestinal
 C inspected
 D informal
- 27 A nerve is made ____ of numerous nerve cells or neurons.
 A up
 B out
 C approximately
 D into
- 28 Some nerves are sensory, others are motor and yet others are ____ .
 A moderate
 B modern
 C mixed
 D made
- 29 Each neuron has a cell body and many ____ projections called dendrites.
 A first
 B fine
 C found
 D founded
- 30 Dendrites from surrounding neurons are ____ to communicate with one another.
 A capable
 B carried
 C arranging
 D able

Test 16

A CURE FOR LOSING ONE'S VOICE?

- 1 Do you believe that there ___ be a cure for losing one's voice?
A can
B are to
C possibly
D potentially
- 2 A new type of gel has been created by scientists to tackle ___ voice boxes.
A conditioned
B treatment
C damages
D damaged
- 3 And this has been ___ by the singer Julie Andrews.
A wearing
B premature
C penetrated
D prompted
- 4 This new gel is injected directly into the vocal ___ !
A cores
B cords
C coordinates
D connections
- 5 What do the team behind this ___ say?
A side
B research
C find
D search
- 6 They say that the gel could ___ the treatment of voice complaints.
A revolutionise
B reach
C reverse
D return
- 7 What are voice ___ in many of the cases the result of?
A drums
B boxes
C certificates
D disorders
- 8 That gentleman is the professor of ___ surgery at Harvard Medical School.
A larynx
B later
C laryngeal
D lateral
- 9 This happened to her after throat surgery ___ non-cancerous growths.
A removed
B to remove
C remote
D reflected
- 10 Professor Zeitels ___ do nothing at that time.
A can
B may
C might
D could
- 11 It was then, however, that he started his early-stage research on ___ treatments.
A imported
B injectable
C improvised
D informal
- 12 His contact with the singer inspired him to follow this ___ of research.
A afterwards
B avenue
C awesome
D arrangements
- 13 The vocal cords are also known as vocal ___ .
A fundamental
B folds
C friends
D fabrics
- 14 The vocal cords ___ as air passes between them
A improve
B vertebratae
C vertebrate
D vibrate

- 15 In many of the ____ they are the result of scarring of the vocal cords
 A cases
 B courts
 C intensities
 D influences
- 16 You know that ____ of the vocal cords is common in teachers.
 A cover
 B overture
 C overuse
 D using
- 17 Causes can also include surgery to remove cancerous or benign ____ .
 A detection
 B general
 C gains
 D growths
- 18 Scarring can also result ____ damage to the larynx.
 A for
 B from
 C at
 D on
- 19 Damage to the larynx can originate from disease or from ____ .
 A acquire
 B count
 C accident
 D account
- 20 A breathing tube is placed down the throat during prolonged ____ .
 A explanation
 B physician
 C surgery
 D surgeon
- 21 As a result of the scarring, the patient suffers from loss of voice ____ .
 A strength
 B start
 C different
 D strong
- 22 In extreme cases, a patient can ____ lose his voice.
 A competently
 B completely
 C thorough
 D thoughtful
- 23 This is what ____ the sound during speaking or singing.
 A plays
 B reports
 C produces
 D injects
- 24 The vocal cords have a soft ____ cover.
 A outside
 B attachment
 C attraction
 D outer
- 25 Damage leads to ____ car tissue replacing this normal soft tissue.
 A start
 B stiff
 C positioned
 D proper
- 26 ____ of the scarring include hoarseness or a rough, scratchy voice.
 A States
 B Symptoms
 C Condition
 D Opinions
- 27 It is also difficult to ____ the high notes during singing.
 A tip
 B hit
 C pit
 D heave
- 28 The new treatment does not ____ on the scar tissue as a problem.
 A force
 B focus
 C fail
 D foresee
- 29 It is rather aimed at improving the ____ of the remaining healthy tissue.
 A flexibility
 B fortune
 C foreword
 D forceps
- 30 By ____ the molecules of the material, the researchers changed its elasticity.
 A affecting
 B altering
 C arising
 D appointing

Test 17

**DIABETICS ARE USUALLY TOLD TO EAT
PLENTY OF CARBS...**

- 1 There is no doubt carbohydrate is an important ____ for the body.
A form
B fuel
C fuse
D fierce
- 2 Why do you think it is a good ____ of energy?
A solvent
B saucer
C source
D sauce
- 3 It is important because it is easily ____ into glucose.
A composed
B worn
C supported
D converted
- 4 What does eating too much carbohydrate ____ ?
A contain
B mean
C correct
D infect
- 5 Eating too much carbohydrate brings a constant ____ for insulin.
A formulation
B relief
C demand
D destiny
- 6 Cells in the body can then become insulin-____ .
A proposed
B reported
C resistant
D reflected
- 7 This produces a vicious ____ of events.
A concern
B core
C cycle
D certificate
- 8 Dr Tony Leeds is an ____ specialist at the Whittington Hospital in London.
A obvious
B careful
C erroneous
D obesity
- 9 The evidence now ____ we should be using a slightly higher-protein diet.
A stands
B suggests
C stays
D seeks
- 10 This – not just for people ____ diabetes, but perhaps for everyone.
A in
B of
C with
D from
- 11 This ____ blood glucose levels and therefore the need for insulin.
A leaks
B lowers
C implements
D contains
- 12 Earlier in 2011, this sea change was given official ____ .
A banking
B ranking
C backing
D lacking
- 13 This followed a growing ____ of research.
A place
B body
C size
D season
- 14 The research suggests that a low-carb diet is good for Type 2 ____ .
A diabetes
B diabetics
C distances
D determinations

- 15 What does the body do ____ with the insulin resistance?
 A to strengthen
 B to deal
 C fight
 D dealt
- 16 The body keeps producing higher and higher ____ of insulin.
 A members
 B addicts
 C levels
 D articles
- 17 This, ____, makes the cells more resistant.
 A in the play
 B in nature
 C in turn
 D in advance
- 18 As the cells are more resistant, the blood sugar levels ____ high.
 A report
 B remain
 C react
 D exact
- 19 Excess sugars become ____ as fat, which causes weight gain.
 A sliced
 B created
 C stored
 D strained
- 20 This can ____ to the development of Type 2 diabetes.
 A leave
 B look
 C leak
 D lead
- 21 The new ____ about Type 2 diabetes are a result of a review of medical evidence.
 A guides
 B guidelines
 C generation
 D gender
- 22 Is a high-carbohydrate ____ really best for people with diabetes?
 A pain
 B diet
 C difference
 D prescription
- 23 An interesting study was ____ in 2004 in the journal *Diabetes*.
 A escorted
 B corrected
 C published
 D ready
- 24 Another important study ____ the same year in *Annals of Internal Medicine*.
 A arrived
 B cured
 C appeared
 D cared
- 25 The American Diabetic Association ____ its advice on low-carb diets in 2008.
 A controlled
 B compiled
 C changed
 D charged
- 26 And, yes, the UK ____ have followed suit.
 A advisor
 B authorities
 C advanced
 D author
- 27 What about the new ____ from Diabetes UK for people with Type 2 diabetes?
 A adverbs
 B advice
 C mode
 D arrival
- 28 Less than 45 per cent of ____ should come from carbohydrates.
 A doers
 B containers
 C calories
 D connections
- 29 The new advice was ____ issued in March, 2011.
 A quiet
 B quote
 C quietly
 D quite
- 30 How can ____ people suffering from Type 2 diabetes lose weight?
 A obstacle
 B obtain
 C obese
 D obvious

Test 18

THE DIFFERENT TYPES OF *H* AND *N*...

- 1 People often speak ____ when they use the word *flu*.
A difficult
B loosely
C loose
D light
- 2 This is perhaps because we do not ____ how serious it really is.
A resort
B resolve
C realise
D refrain
- 3 The fact is that “ordinary” seasonal flu ____ up to half a million lives a year!
A wears
B claims
C tears
D complains
- 4 Many people die in the tropics, where flu generally goes ____ .
A undiagnosed
B diagnostical
C incorrect
D infectious
- 5 Did you know that the modern flu research began ____ in 1933!
A formulated
B seriously
C considerate
D determined
- 6 It was in 1933 that scientists first ____ the human influenza virus.
A insulated
B ensured
C employed
D isolated
- 7 A virus is a microscopic ____ that works a bit like a parasite.
A particular
B particle
C pendulum
D precaution
- 8 He thought that “an effective competitor poison” for the virus enzyme could prevent ____ .
A opportunity
B infection
C introduction
D care
- 9 What did Burnet’s protégés find ____ by his ideas?
A introduced
B informed
C invested
D inspired
- 10 One spike-like protein on the ____ of the virus was named *haemagglutinin (H)*.
A stream
B surface
C system
D source
- 11 *Haemagglutinin* binds ____ sialic acid on the cell.
A to
B low
C in
D from
- 12 After that it ____ the cell and infects it.
A ranks
B penetrates
C backs
D lacks
- 13 Another protein – *neuraminidase (N)* – cleaves ____ the sialic acid.
A past
B after
C off
D of
- 14 Thus the multiplying virus is allowed ____ the cell to infect other ones.
A lowering
B to lower
C leaving
D to leave

- 15 Unlike parasites, a virus is not, ___ speaking, "alive".
 A strictly
 B strangely
 C strongly
 D systematically
- 16 They cannot reproduce unless they ___ themselves to the cell of some organism.
 A affect
 B attach
 C attack
 D addict
- 17 When they do so, they ___ that organism, whether it be plant, animal, or human.
 A invent
 B intact
 C infect
 D insect
- 18 In the 1940s it was found that it was an enzyme on the virus that ___ the damage.
 A made
 B put
 C reacted
 D did
- 19 The damage is produced to the human organism by destroying certain ____ .
 A producers
 B receptors
 C reformers
 D receivers
- 20 The damage is produced on the red blood ____ .
 A cells
 B tissues
 C cores
 D leaders
- 21 MacFarlane Burnet was drawing on this knowledge in seeking some sort of ___ or cure.
 A proposal
 B prevention
 C prestige
 D position
- 22 He had that idea about a drug ___ "an effective competitor poison".
 A preserving
 B dieting
 C representing
 D prescribing
- 23 The different types of *H* and *N* make up all ___ of flu virus.
 A worms
 B varieties
 C variables
 D voices
- 24 In the early 1970s Laver was researching the connection between ___ flu and birds.
 A pandemic
 B personal
 C phonetic
 D presented
- 25 The Australian scientist collected and analysed samples from ___ on the Great Barrier Reef.
 A nest
 B nesting sites
 C next sites
 D charges
- 26 He found that *neuraminidase* could be ___ into a crystalline form.
 A spoilt
 B spoiled
 C spun
 D spiced
- 27 This was ___ to do using a centrifuge, of course.
 A potential
 B possible
 C provoked
 D positioned
- 28 The ___ *neuraminidase* form was amorphous, we come to know.
 A usually
 B using
 C confused
 D usual
- 29 Nowadays you could use a computer, but then it was done more or less ____ .
 A mortally
 B manually
 C morphologically
 D momentarily
- 30 The important thing is to keep the virus ___ to an infected cell and unable to spread.
 A glued
 B growing
 C general
 D generated

Test 19

**A DISEASE MORE SEVERE
THAN THE COMMON COLD**

- 1 *Influenza* is ____ referred to as the *flu*.
A commonly
B momentarily
C preparedly
D cardinally
- 2 It is an ____ disease caused by RNA viruses of the family *Orthomyxoviridae*.
A interesting
B infectious
C interpreting
D immediate
- 3 This disease ____ birds and mammals.
A affects
B explains
C arranges
D admires
- 4 The most common ____ of the disease are chills, fever, sore throat, muscle pains, headache, ...
A happenings
B cores
C symptoms
D stations
- 5 It is often ____ with other influenza-like illnesses, especially the common cold.
A confused
B contained
C corrected
D defined
- 6 However, influenza is more severe than the common cold, ____ by a different type of virus.
A happening
B held
C certified
D caused
- 7 Influenza may ____ nausea and vomiting, particularly in children.
A produce
B perform
C to bring
D clear
- 8 This means that frequent hand washing reduces the ____ of infection.
A construction
B choice
C risk
D road
- 9 Influenza spreads around the world in ____ epidemics.
A seasonal
B spreading
C seasoned
D simultaneous
- 10 These epidemics result in the ____ of between 250,000 and 500,000 people every year.
A demonstration
B deaths
C circulation
D amendments
- 11 These numbers can rise up to millions in some ____ years.
A pandemic
B possession
C vaccine
D past
- 12 You know that three influenza pandemics ____ in the 20th century.
A relieved
B revealed
C obtained
D occurred
- 13 These pandemics killed ____ of millions of people.
A tens
B ten
C sets
D seats
- 14 Each of them was caused by the appearance of a new ____ of the virus in humans.
A support
B strain
C system
D train

- 15 Gastroenteritis is sometimes, _____, referred to as "stomach flu".
 A exclusively
 B inaccurately
 C chronically
 D surgically
- 16 Flu can occasionally cause direct _____ pneumonia.
 A viral
 B spinal
 C cerebral
 D viruses
- 17 It can occasionally also cause secondary _____ pneumonia.
 A bacteria
 B healthy
 C bacterial
 D certain
- 18 Typically, influenza is _____ through the air by cough or sneezes.
 A transmitted
 B transgressed
 C tortured
 D portrayed
- 19 Influenza can also be caught in direct contact with bird droppings or nasal _____.
 A secrets
 B certificates
 C contact
 D secretions
- 20 Airborne _____ have been thought to cause most infections.
 A aerosols
 B episodes
 C exercises
 D entertainment
- 21 However, which means of transmission is most important is not _____ clear.
 A discretely
 B absolutely
 C differently
 D already
- 22 Influenza viruses can be _____ by sunlight, disinfection, and detergents.
 A inactivated
 B inaugurated
 C implemented
 D imported
- 23 This often happens when an existing flu virus spreads to humans from other animal _____.
 A species
 B stocks
 C stations
 D representatives
- 24 What about vaccinations _____ influenza?
 A counting
 B around
 C against
 D after
- 25 Unfortunately, they are usually made _____ to people in developed countries.
 A available
 B subsequent
 C according
 D admitted
- 26 Farmed poultry is often vaccinated to avoid _____ of the flocks.
 A definition
 B decimation
 C distance
 D protection
- 27 The most common human vaccine is the _____ influenza vaccine – TIV.
 A trivalent
 B three-dimensional
 C tradition
 D surgical
- 28 The TIV contains _____ and inactivated antigens against three viral strains.
 A petrified
 B conical
 C purified
 D qualified
- 29 The TIV _____ no risk of transmitting the disease.
 A carries
 B takes
 C makes
 D forms
- 30 A vaccine formulated for one year may be _____ in the following year.
 A intransitive
 B inspected
 C influential
 D ineffective

Test 20

DOES MOTHER NATURE KNOW BEST?

- 1 Have you ever thought about ____
Mother Nature really knows best?
A weather
B whether
C whoever
D whatever
- 2 Does Mother Nature know best when
it comes to the question of ____ ?
A clone
B getting
C cloning
D engineer
- 3 It is using genetic engineering to make
____ copies of living plants and animals.
A effortless
B effort
C effect
D exact
- 4 Cloning has been in science
____ for many years now.
A fiction
B foundation
C formation
D friction
- 5 It has even become
part of ____ life, you know.
A realistically
B real
C reality
D realm
- 6 It became the ____
of public life in 1997.
A success
B standing
C subject
D object
- 7 That year it all ____ with
the cloning of a sheep, Dolly.
A cared
B played
C being
D started
- 8 Human tissue can also be
cloned for use in ____ therapy.
A general
B genetics
C engineering
D gene
- 9 Also, organs could be
____ by human clones.
A pretended
B proscribed
C provided
D prescribed
- 10 What could happen when a child ____ from
a fatal disease and needs an organ donor?
A represents
B is suffering
C is susceptible
D is making
- 11 Parents could have the child's
younger ____ brother or sister.
A cloned
B certain
C postponed
D prepared
- 12 This would effectively be
an identical ____ .
A trends
B taking
C twofold
D twin
- 13 Of course, this would provide
100% donor ____ .
A connection
B treatment
C compatibility
D comprehension
- 14 Couples who cannot have children
may wish to clone a child from ____ .
A their
B themselves
C them
D the ones

- 15 In February, 1997, scientists in Scotland claimed they successfully ___ a ewe.
 A produced
 B revitalised
 C promoted
 D constructed
- 16 Ewe is the ___ of the sheep, especially when mature.
 A woman
 B female
 C first
 D formality
- 17 Dolly was cloned from another ___ ewe.
 A adverse
 B administered
 C adult
 D advertised
- 18 What ___ possibility was conceded later?
 A remote
 B reference
 C previous
 D popular
- 19 Dolly might have been cloned from foetal cells that were ___ in the ewe's bloodstream.
 A cycling
 B circulating
 C cruising
 D circling
- 20 Is human cloning ___ for all people?
 A accommodated
 B accused
 C acceptable
 D added
- 21 For some people, human cloning is OK in medicine despite all the ____ .
 A reviews
 B reviewers
 C critics
 D criticisms
- 22 For example, human tissue can be cloned for use in organ ____ .
 A replacement
 B connection
 C construction
 D recovery
- 23 ___ animals could be cloned to increase their numbers.
 A Prehistoric
 B Affected
 C Implanted
 D Endangered
- 24 On the other hand, there are many arguments ___ cloning.
 A afterwards
 B arranged
 C against
 D after
- 25 Many people saw the cloning of Dolly as a major ____ .
 A thorough
 B breakthrough
 C broke
 D through
- 26 In reality, it is just another ____ towards 'playing with nature'.
 A step
 B stops
 C spot
 D stream
- 27 Scientists have no idea of the ____ effects of genetic engineering.
 A thermal
 B terminal
 C long
 D long-term
- 28 More and more genetically ____ plants are being produced.
 A tender
 B accepted
 C altered
 D tolerated
- 29 Creating 'perfect' plants and animals could eliminate the great variety of ____ .
 A systems
 B species
 C stations
 D formality
- 30 It is ___ that we need to regulate genetic engineering now, before it is too late!
 A clear
 B clean
 C cleaned
 D cloned

Test 21

DOWN THE HATCH!

- 1 From brain tissue to gallstones – doctors have long preserved ____ .
A speculation
B specialization
C specimens
D spectacles
- 2 They have preserved them as trophies, as teaching ____, curiosities, or even art.
A circumstances
B technology
C tools
D tissues
- 3 In all that, Dr. Chevalier Jackson went much ____ than most.
A favourable
B farther
C father
D further
- 4 He was a laryngologist who worked in the late 19th and early 20th ____ .
A contemporaries
B connection
C centuries
D century
- 5 He preserved more than 2,000 ____ that people had swallowed or inhaled.
A subjects
B circumstances
C objects
D instances
- 6 Among other things, there is a medallion that says ____ *me for good luck*.
A *Cost*
B *Care*
C *Carry*
D *Can't*
- 7 Dr. Jackson ____ these from people's upper torsos.
A remarked
B respected
C retrieved
D revoked
- 8 Dr. Jackson experimented ____ on mannequins and dogs.
A phonetically
B availably
C exaggerated
D extensively
- 9 In those days surgery was ____ with high mortality, of course.
A continued
B opened
C associated
D explained
- 10 Few physicians were willing or able to peer into the air and food ____ .
A positions
B propositions
C passages
D pastures
- 11 The survival ____ among his patients was better than 95 percent!
A rate
B state
C rare
D reason
- 12 Jackson ____ the world as a precarious place.
A moved
B stared
C viewed
D looked
- 13 As a child, he endured ____ torment and bullying.
A intense
B initiated
C intensive
D intuitive
- 14 Other children once blindfolded him and ____ him into a coal pit.
A draw
B pulled
C threw
D throw

- 15 He generally did this with little or ____ anaesthesia.
 A nothing
 B nowhere
 C no
 D notify
- 16 Ms Cappello is the author of a new book about Jackson and his ____ collection.
 A bookish
 B bizarre
 C genius
 D general
- 17 The truth is that his ____ had the effect of saving lives.
 A obstetrician
 B order
 C obsession
 D ophthalmologist
- 18 Lucky for us that his ____ made possible forms of rescue!
 A mechanics
 B momentary
 C madness
 D moments
- 19 Jackson was an ____ and a mechanical prodigy.
 A artefact
 B artisan
 C artistic
 D physicist
- 20 He was an ascetic whom colleagues sometimes described as ____ or cold.
 A exported
 B about
 C a loaf
 D aloof
- 21 He spent hundreds of hours ____ peanuts with forceps.
 A combining
 B craving
 C crushing
 D caring
- 22 He did that in order to learn exactly how much pressure ____ .
 A to escort
 B exerted
 C to exert
 D extend
- 23 He was ____ only after a dog happened to find him unconscious.
 A received
 B rescued
 C reported
 D revealed
- 24 In a sense, he was saving lives, but he was also saving ____ .
 A it
 B him
 C himself
 D hour
- 25 Gradually he ____ to be a pioneer of the upper body.
 A grow
 B growth
 C grew
 D greeted
- 26 He developed new endoscopic techniques for peering into dark ____ .
 A recesses
 B reports
 C reminders
 D prospects
- 27 Physicians who used endoscopes had ____ worked with light held outside the body.
 A conditionally
 B instantly
 C previously
 D roughly
- 28 He was an outspoken safety advocate, particularly when it ____ to children.
 A come
 B came
 C famed
 D created
- 29 What does it mean to be "foreign-body-conscious" ____ swallowing?
 A of
 B on
 C about
 D from
- 30 He would quarter parents who fed peanuts to children without ____ .
 A males
 B holes
 C moles
 D molars

Test 22

**ELEMENTS OF THE HUMAN
MUSCULAR SYSTEM**

- 1 The study of muscles is called ____ , did you know that?
A biology
B myology
C pedagogy
D laryngology
- 2 The muscular system is composed of specialized cells called muscle ____ .
A settings
B tones
C fibers
D grains
- 3 Have you learned already that there are three kinds of muscle ____ ?
A form
B wire
C wear
D tissue
- 4 Smooth muscles ____ the walls of the hollow body organs.
A correct
B make up
C continue
D care for
- 5 They move involuntarily and produce wavelike ____ .
A stations
B notions
C motions
D moments
- 6 They are also present in the walls of the blood vessels and ____ passageways.
A dormitory
B hospital
C respiratory
D renewed
- 7 With their peristalsis they move ____ through a system.
A care
B substances
C tissues
D cells
- 8 Nearly all movement in the body is the result of muscle ____ .
A effort
B indication
C condition
D contraction
- 9 Why is the ____ action of joints, bones, and skeletal muscles important?
A integrated
B initiated
C intransitive
D intuitive
- 10 It is so important because it produces ____ movements such as running, e.g.
A connective
B representative
C obvious
D dividing
- 11 Skeletal muscles also produce some more ____ movements.
A subtle
B pretended
C pretentious
D secret
- 12 Such movements result in facial ____ , eye movements, and respiration.
A extensions
B expansion
C expressions
D expressiveness
- 13 The skeletal muscles are continually making fine ____ that hold the body.
A adjustments
B additions
C adversaries
D advantages
- 14 The tendons of many muscles ____ over joints, you know.
A enlarge
B extend
C expect
D exert

- 15 Cardiac muscle tissue creates the ___ action of the heart.
 A putting
 B penetrating
 C pulsing
 D moving
- 16 The cells of cardiac muscle are striated, like those of ___ muscle.
 A additional
 B linear
 C mental
 D skeletal
- 17 They differ in having one ___ per cell and branching interconnections.
 A nucleus
 B core
 C care
 D kernel
- 18 Skeletal muscle tissue ___ heavily striated cells.
 A forms
 B exams
 C features
 D expects
- 19 Such cells are very long and cylindrical, and they have ___ nuclei.
 A mild
 B momentary
 C mutual
 D multiple
- 20 When stimulated, they can contract as a large ____ .
 A uniform
 B unit
 C united
 D unnoticed
- 21 The ___ characteristic of the muscle fibers is *contractibility*.
 A different
 B difficul
 C predominant
 D preposterous
- 22 When stimulated, muscle cells have the ability to shorten or ____ .
 A contain
 B confer
 C contract
 D connect
- 23 This is very important, because in this way they ___ to joint stability.
 A inhibit
 B contribute
 C introduce
 D control
- 24 Heat production serves to ___ body temperature.
 A mitigate
 B mention
 C maintain
 D memorize
- 25 Heat production is an important by-product of muscle ____ .
 A aspiration
 B affection
 C malnutrition
 D metabolism
- 26 Another characteristic of all muscles is that they ___ *responsiveness*.
 A demonstrate
 B defect
 C derange
 D devastate
- 27 How do muscle cells respond to various forms of ____ ?
 A novation
 B stimulation
 C pronunciation
 D preparation
- 28 They respond through an electrical change across their plasma ____ of the cell.
 A member
 B manifestation
 C membrane
 D moderation
- 29 Another very important common ____ of all muscles is their *conductivity*.
 A train
 B thorn
 C wrinkle
 D trait
- 30 The *extendibility* of muscle cells is the ____ of their *contractibility*.
 A opposite
 B opportunity
 C obtained
 D original

Test 23

ENZYMES

- 1 Can you give an ____ definition of enzymes?
A acceptable
B according
C advantage
D understanding
- 2 Enzymes are macromolecular catalysts of biological ____ .
A organization
B origin
C generation
D standard
- 3 All of the enzymes ____ have been found to be proteins, did you know that?
A investigated
B inspired
C intrinsic
D invented
- 4 This is why we can also define enzymes as catalytically ____ proteins.
A complicated
B active
C common
D arranged
- 5 Like other catalysts, enzymes ____ chemical reactions.
A disclose
B analyse
C accelerate
D accept
- 6 What ____ are called *substrates*?
A substances
B circumstances
C concoctions
D performances
- 7 These are the substances which ____ a chemical reaction due to an enzyme.
A contain
B undergo
C bring
D characterize
- 8 Body temperatures can be 0°C – in ____ plants and cold-blooded animals.
A anorexic
B arctic
C edible
D chance
- 9 The presence of enzymes allows the ____ of organic substances in the living cells.
A structure
B conglomerate
C combustion
D comprehension
- 10 It also allows a variety of other reactions to take ____ at these low temperatures.
A precautions
B place
C position
D penetration
- 11 Temperatures of several hundred degrees are ____ for the same reactions *in vitro*.
A required
B recommended
C replaced
D revitalised
- 12 This does not mean, however, that enzymes affect the energy ____ of a reaction.
A morbidity
B bulletin
C mandate
D balance
- 13 To put it in a simple way: enzymes do not ____ energy.
A switch
B supply
C exclude
D treat
- 14 They merely ____ reactions which will bring the system closer to equilibrium state.
A form
B frustrate
C facilitate
D forbid

- 15 Is it true that many of the catalyzed reactions are ____ ?
 A reversible
 B excluded
 C intensified
 D double
- 16 Both the ____ and the reverse reaction may be catalyzed by the same enzyme.
 A frowned
 B forward
 C frequent
 D often
- 17 Theoretically, a catalyst is not used ____ in the catalyzed reaction.
 A to
 B under
 C up
 D away
- 18 Very small amounts of an enzyme ____ for the turnover of large amounts of the substrate.
 A suffice
 B effect
 C affect
 D suffocate
- 19 However, being proteins, the enzymes suffer the ____ of all proteins.
 A fact
 B fate
 C face
 D fortune
- 20 In other words, they are ____ metabolized and degraded.
 A slowly
 B severely
 C extremely
 D cautiously
- 21 This is why they have to be continually regenerated in the ____ .
 A division
 B organism
 C volume
 D organisation
- 22 The function of enzymes is to make ____ reactions possible at body temperature.
 A thorough
 B painful
 C persistent
 D metabolic
- 23 What is one of the ____ chemical reactions?
 A enclosed
 B simplest
 C swallowed
 D surgical
- 24 It is the combination of oxygen with hydrogen to ____ water: $O_2 + 2H_2 \rightarrow 2H_2O$.
 A form
 B demonstrate
 C downgrade
 D defect
- 25 In this reaction the equilibrium ____ far to the right.
 A surrenders
 B waits
 C treats
 D lies
- 26 It is so far to the right that the reverse reaction cannot be ____ .
 A tormented
 B observed
 C named
 D practised
- 27 The reaction proceeds with the ____ of an enormous amount of energy.
 A release
 B medication
 C meditation
 D repetition
- 28 A mixture of hydrogen and oxygen can be ____ practically indefinitely.
 A exchanged
 B stored
 C circulated
 D summoned
- 29 Yes, practically indefinitely – without any ____ of explosion!
 A drawing
 B dentistry
 C danger
 D disturbance
- 30 If a trace of activated platinum is ____ into that mixture, it acts as a catalyst.
 A inspired
 B invented
 C important
 D introduced

Test 24

EYE IMPLANT FOR MACULAR OEDEMA

- 1 Does retinal vein ____ come with any warning?
A occlusion
B obstacle
C system
D plasma
- 2 It can be very ____ exactly because it comes with no warning!
A free
B frightening
C wearing
D understandable
- 3 Very often, a patient wakes up with poor vision ____ one eye.
A on
B at
C in
D from
- 4 Many wake up with a black spot in the centre of the ____ of vision.
A complexion
B field
C combination
D form
- 5 If ____, macular oedema can cause blindness.
A direct
B untreated
C treated
D definite
- 6 The condition occurs when a blood ____ forms in a retinal vein.
A cleft
B clot
C knot
D node
- 7 Retinal veins are ____ to drain blood from the eye.
A sent
B leaned
C meant
D lent
- 8 This condition can lead to a ____ visual impairment.
A selected
B safe
C sever
D severe
- 9 Macular oedema can also be caused by wet age-related macular ____, and diabetes.
A degeneration
B frustration
C prohibition
D prevalence
- 10 The fact is that high blood-sugar levels damage the blood ____ next to the retina.
A cells
B clots
C vessels
D vertebratae
- 11 Could *Ozurdex*, the treatment they are ____ now, help all these patients?
A connecting
B making
C trialling
D playing
- 12 It was ____ for use in June, 2011.
A surrendered
B advanced
C asked
D approved
- 13 Trials are also ____ for its use on other causes of macular oedema.
A underway
B unknown
C untreated
D unimportant
- 14 The treatment ____ injecting a steroid into the eye.
A involves
B improvises
C informs
D insulates

- 15 Blood supplies essential ___ and oxygen to the retina.
 A intensity
 B nutrients
 C nuts
 D enzymes
- 16 Can you explain to us what retina is, ___ the first place?
 A at
 B in
 C from
 D on
- 17 Retina is the light-sensitive ___ at the back of the eye.
 A disease
 B condition
 C trend
 D tissue
- 18 It is the light-sensitive retina that ___ us to see, you know.
 A explains
 B allows
 C expects
 D operates
- 19 Do you know what happens when a retinal vein is ___ ?
 A lighted
 B locked
 C banned
 D blocked
- 20 Due to this, blood and other fluids ___ into the retina.
 A tender
 B leave
 C leak
 D look
- 21 The main ___ is atherosclerosis, or hardening of arteries.
 A volume
 B vessel
 C connection
 D cause
- 22 Atherosclerosis is most ___ in those aged 65 and older.
 A common
 B penetrating
 C careful
 D positioned
- 23 *Dexamethasone* is injected into the eye to ___ the inflammation of the retinal vein.
 A report
 B reduce
 C introduce
 D implant
- 24 In this way damage to the retina can be ___, hopefully.
 A deformed
 B demonstrated
 C creased
 D decreased
- 25 I hear that this steroid has been ___ since the 1970s.
 A planted
 B used
 C allergic
 D synthesized
- 26 Until now, however, it only had a short-lived ___, researchers say.
 A affect
 B effect
 C apparatus
 D effort
- 27 In this new trial they implant the steroid in a biodegradable capsule, just 6 mm ____ .
 A stitched
 B strong
 C long
 D heavy
- 28 This dissolves over months, slowly ___ the drug.
 A administering
 B releasing
 C maintaining
 D making
- 29 That way, it lasts longer and can ___ vision loss for good.
 A contribute
 B reverse
 C contrast
 D collide
- 30 This is a major step ___ in treating this condition and could help many thousands.
 A forgot
 B followed
 C frowned
 D forward

Test 25

FIGHTING FOR THE BREATH OF LIFE...

- 1 At that moment Crest made his own ___ without any doubt.
A diagnostics
B diagnostic
C diagonals
D diagnosis
- 2 Yes, he knew he was ___ a coronary heart attack.
A getting
B making
C having
D receiving
- 3 He was drowning in a sea of ___ and pain.
A pressure
B presence
C pest
D position
- 4 One small part of his consciousness was somehow uninvolved in this ___ struggle.
A lean
B leak
C like
D life
- 5 That part of his consciousness was able to study the scene with scientific ____ .
A devoted
B definite
C detachment
D detached
- 6 The ____, with X-ray eyes, seemed to be looking at his heart.
A opportunity
B obsolete
C observer
D observance
- 7 The heart is a tough elastic bundle of interconnected ___ strands.
A ulcer
B mucus
C muscle
D mucous
- 8 There were sludgy ___ of cholesterol, like rust in a dirty pipe.
A patches
B choices
C cubes
D positions
- 9 The sludge in that vessel had caused ____, and he knew that.
A connection
B attraction
C statement
D narrowing
- 10 Clotting suddenly occurred to block ___ the vessel completely.
A on
B off
C about
D onto
- 11 An area of heart muscle supplied by the blocked vessel was ___ of blood.
A uncertain
B injected
C implemented
D deprived
- 12 That area was blanching white, which means – critically ____ .
A measured
B injured
C made
D opened
- 13 Pain impulses from the dying muscle caused the pressure and ___ in the chest.
A colour
B string
C point
D pain
- 14 He knew that the area of affected ___ would die.
A intake
B projection
C system
D tissue

- 15 The heart is a big fist, squeezing tight with a ____ motion, once a second.
 A rotating
 B round
 C retinal
 D rounded
- 16 It squeezes tight every second, from ____-uterine life to the moment of death.
 A instant
 B intra
 C infra
 D inter
- 17 Inside, there are four ____ leaflets, opening and snapping shut.
 A venal
 B vary
 C valve
 D vascular
- 18 The mitral one is ____ like a bishop's miter.
 A shaped
 B examined
 C shared
 D extracted
- 19 Can you tell us something about the electrical ____ controlling the beat?
 A importance
 B impulses
 C inspection
 D intestine
- 20 The coronary arteries are small ____ vessels off the main aorta.
 A tricuspid
 B tendon
 C treated
 D tributary
- 21 They hook back to supply the ____ of the heart itself with blood.
 A muscle
 B moment
 C monitor
 D measure
- 22 One of the ____ vessels in his heart showed corrosion in the lining.
 A coronary
 B care
 C coordinated
 D concrete
- 23 If that area was big ____, the heart would stop and he would die.
 A inhibited
 B sufficient
 C enough
 D thorough
- 24 If the mass of uninjured muscle could limp along efficiently – he would ____ .
 A satisfy
 B survive
 C promote
 D vaccinate
- 25 After that the area of injury would ____ dark and rot.
 A return
 B make
 C turn
 D take
- 26 And then, he thought, the process of ____ would begin.
 A shock
 B record
 C study
 D repair
- 27 Collagen ____ would creep into the area of decay.
 A methods
 B membership
 C finds
 D fibers
- 28 If he was lucky, after some eight weeks his heart would be almost as ____ as it was before.
 A certain
 B new
 C strong
 D creative
- 29 If he was half lucky, his heart would function under ____ activity.
 A lateral
 B preliminary
 C limited
 D performed
- 30 If the ____ that formed was too weak, it might blow out like a badly patched tire.
 A seat
 B scar
 C bone
 D organ

Test 26

**THE FRAMEWORK
WHICH SUPPORTS THE BODY**

- 1 Have you ever ___ about what really supports your body?
A taught
B sought
C fought
D thought
- 2 Human ___ consists of both fused and individual bones.
A system
B skeleton
C standing
D stature
- 3 The bones are supported and ___ by ligaments, tendons, muscles and cartilage.
A supplemented
B implemented
C born
D aroused
- 4 The skeleton serves as a ___ which supports organs.
A scaffold
B situation
C twofold
D care
- 5 It ___ muscles, and protects organs such as the brain, lungs and heart.
A anchors
B rivets
C turns
D destroys
- 6 The biggest bone in the body is the femur, in the ____ .
A thigh
B tough
C thought
D tight
- 7 The smallest bone in the body is the stapes bone in the ___ ear.
A master
B medium
C mild
D middle
- 8 The long bones and most other bones ___ form from the cartilaginous skeleton.
A busily
B temporarily
C incidentally
D gradually
- 9 They form ___ the remaining gestation period.
A throughout
B round
C through
D around
- 10 They continue to form for years after ___ in a process called endochondral ossification.
A berth
B precaution
C birth
D demonstration
- 11 What about the ___ bones of the skull and the clavicles?
A first
B foreign
C flat
D floor
- 12 They are formed from ___ tissue in a process of intramembranous ossification.
A connective
B hard
C straight
D compound
- 13 Ossification of the mandible ___ in the fibrous membrane.
A schedules
B visits
C expands
D occurs
- 14 A ___ baby has over three hundred bones, can you imagine that!
A newborn
B new
C heavy
D strong

- 15 In an adult, the skeleton ___ around 30-40% of the total body weight.
 A comprises
 B intensifies
 C connects
 D charges
- 16 Fused bones ___ those of the pelvis and the cranium.
 A add
 B include
 C mount
 D operate
- 17 Not all bones are interconnected ____ .
 A conditionally
 B solely
 C directly
 D densely
- 18 The ossicles, for instance, ___ only with each other.
 A express
 B impress
 C articulate
 D cure
- 19 The hyoid bone is ___ in the neck.
 A studied
 B located
 C served
 D trusted
- 20 That bone serves as the point of ___ for the tongue.
 A attachment
 B exploitation
 C collection
 D membership
- 21 It does not articulate ___ any other bones in the body.
 A for
 B at
 C with
 D from
- 22 Early in gestation, a ___ has a cartilaginous skeleton.
 A woman
 B youth
 C fetus
 D parent
- 23 And did you know that ___ average an adult human has 206 bones?!
 A in
 B on
 C at
 D after
- 24 Of course, these numbers can ___ slightly from individual to individual.
 A very
 B verify
 C vary
 D warrant
- 25 The difference comes from a number of small bones that fuse together during ____ .
 A gestation
 B summer
 C growth
 D treatments
- 26 The skeleton provides the framework which supports the body and ___ its shape.
 A offers
 B maintains
 C donates
 D performs
- 27 What do the pelvis and ___ ligaments provide?
 A associated
 B membrane
 C medical
 D surgical
- 28 Yes, they provide a ___ for the pelvic structures.
 A table
 B sphere
 C floor
 D ceiling
- 29 The ___ between bones permit movement, of course.
 A gums
 B teeth
 C jokes
 D joints
- 30 Skeletal muscles are attached to the skeleton at ___ sites on bones.
 A variable
 B various
 C varied
 D variety

Test 27

THE HOUSE OF ILL REPUTE

- 1 What is the ___ of the Latin word *diverticulum*?
A application
B master
C meaning
D most
- 2 Can you give your own ___ of “the wayside house of ill repute”?
A imagination
B interpretation
C importance
D implementation
- 3 *diverticulae* are small pouches that ___ from any tubular structure in the body.
A position
B prepare
C penetrate
D protrude
- 4 *Diverticulae* are most commonly seen, however, in the large ____ .
A testicle
B intestine
C system
D head
- 5 These pouches occur at a ___ in the muscle walls of a tubular structure.
A worst
B warmth
C weekly
D weakness
- 6 In other words, these pouches cause the lining to ___ out.
A build
B bulge
C happen
D stare
- 7 The ___ of multiple *diverticulae* is referred to as *diverticulosis*.
A performance
B position
C presence
D epidemic
- 8 The cause of *diverticulosis* is thought to be a lifelong low-fibre ____ .
A charity
B viscosity
C density
D diet
- 9 The condition can also be observed incidentally, during ____, for instance.
A surrounding
B surgical
C surgery
D surgeon
- 10 What happens when you increase the ___ contents of what you eat?
A brave
B bulk
C brown
D brand
- 11 Counter-intuitively, this ___ the chances of diverticulosis.
A demonstrated
B minimises
C insides
D prepares
- 12 Ten to twenty percent of patients will experience painful ___ at some stage.
A inflammation
B magnitude
C certainty
D malnutrition
- 13 It can usually be treated ___ antibiotics to kill the bacteria.
A with
B by
C to
D under
- 14 Unfortunately, this is often a ___ problem.
A renowned
B revealed
C repetition
D recurrent

- 15 It is interesting to note that 70 percent of those with *diverticulosis* have no ____ .
 A symptoms
 B prospects
 C characteristics
 D security
- 16 Do you know that *diverticulae* can ____ from 3mm to 3 cm?!
 A address
 B be
 C seem
 D articulate
- 17 What happens when the *diverticulae* become ____ ?
 A optional
 B resumed
 C inflamed
 D underlined
- 18 When they start to ____ – the condition starts to cause problems.
 A summon
 B bright
 C bore
 D bleed
- 19 This ____ condition is called *diverticulitis*.
 A neurological
 B operated
 C interchanged
 D aggravated
- 20 *Diverticulitis* is characterised by ____ pain, temperature, blood in stools.
 A surgical
 B vascular
 C abdominal
 D cerebral
- 21 *Diverticulosis* is ____ in people under the age of 40.
 A dissected
 B rare
 C right
 D voluminous
- 22 It becomes increasingly common with ____ .
 A age
 B ambulance
 C hospital
 D perception
- 23 If the poroblem becomes that serious, the section of ____ might have to be removed.
 A box
 B bowel
 C scope
 D sequence
- 24 Why do you think the patients are ____ to avoid eating seeds?
 A affected
 B accomplished
 C advised
 D advocated
- 25 The belief is that seeds might become ____ in one of these pouches.
 A irritated
 B impacted
 C imposed
 D impersonal
- 26 The waves of movement invariably ____ the material from the pouches, of course.
 A dislodge
 B found
 C demonstrate
 D service
- 27 The ____ to the patients is to eat a high-fibre contents of fruit, salads, grains...
 A message
 B medication
 C memory
 D mentor
- 28 What does it mean “to shut the ____ door after the horse has bolted“?
 A strong
 B stable
 C standing
 D station
- 29 However, this can at least ____ the pressure inside.
 A like
 B lower
 C approximate
 D reject
- 30 Hopefully, this can minimise the ____ of *diverticulosis*.
 A plastering
 B frightening
 C worsening
 D tightening

Test 28

HOW BENEFICIAL IS A CUPPING TREATMENT?

- 1 Can you explain what a *cupping treatment* is, in the ___ place?
A first
B front
C foundation
D formation
- 2 Who discovered the ___ of blood?
A conglomerate
B characteristic
C circulation
D circumference
- 3 It was William Harvey ___ did that, four hundred years ago
A whoever
B why
C what
D who
- 4 Medical science has come a long ___ in these four hundred years.
A way
B why
C warrant
D warmth
- 5 Can you mention some of Medicine's more notable ___ ?
A advertisements
B achievements
C annexes
D atmospheres
- 6 What can ___ us of some forms of traditional treatment?
A uphold
B remind
C arrange
D detect
- 7 What can we see on the backs of some film stars ___ low-cut dresses?
A playing
B wearing
C bringing
D operating
- 8 The ___ glass cups should preferably be of thick glass.
A holding
B heightened
C heated
D hold
- 9 As the air inside the cup ___, it creates a vacuum.
A gets
B cools
C comprises
D sucks
- 10 The theory ___ that this stimulates blood flow.
A begins
B works
C asks
D goes
- 11 This stimulates blood flow and ___ the "toxins" out of the body.
A puts
B sucks
C implements
D cuts
- 12 Mr. Nish Yoshi is described in London as "the super-___ man to the stars".
A impersonal
B immunity
C immature
D indefinite
- 13 He offers a ___ of alternative treatments.
A range
B treatment
C size
D implant
- 14 His alternative treatments ___ acupuncture, homeopathy, Ayurvedic medicine...
A transplant
B prepare
C include
D impress

- 15 The large, round red weals are in fact ___ of a kind.
A measurements
B marks
C moments
D starts
- 16 These marks are caused by an ___ therapy known as "cupping".
A adjoining
B assisted
C artificial
D alternative
- 17 This treatment is credited with everything from ___ aches and pains.
A retaining
B refraining
C revealing
D relieving
- 18 It is believed to have ___ in China, you know.
A obtained
B originated
C arranged
D extracted
- 19 It was ___ to Europe by the Jesuits in the 13th or 14th century.
A shared
B connected
C brought
D operated
- 20 It is sometimes described as a "___ of acupuncture".
A fight
B focus
C frame
D form
- 21 Some also ___ it a "middle-class leeching".
A care
B call
C cure
D count
- 22 It involves placing a heated glass cup upside ___ on the skin.
A around
B down
C up
D behind
- 23 Pulse and tongue ___ are used to assist in the herbal treatment.
A difference
B diagnosis
C preferences
D incisions
- 24 The herbal treatment of medical conditions is without the ___ effects of modern medicine.
A seed
B seemed
C site
D side
- 25 Toxins are ___ in the tissues and lymphatic channels.
A grabbed
B stayed
C trapped
D treated
- 26 He says that "cupping" works by ___ these toxins into the blood stream.
A drawing
B doing
C lining
D protecting
- 27 To many medical ___ all this is only comic.
A specialties
B statisticians
C specialists
D surgeons
- 28 The gentleman is the head of the department of ___ medicine at the University of Exeter.
A completion
B compliment
C complete
D complementary
- 29 "Cupping" has been ___ for thousands of years but there is no evidence it works.
A round
B about
C around
D formally
- 30 In any case, we already have a number of organs that ___ the body.
A obstruct
B intensify
C attract
D detoxify

Test 29

HYPOTHYROIDISM AND THE HARM IT CAUSES

- 1 Which is one of the most common ___ disorders?
A endocrinal
B endocentric
C experimental
D exaggerated
- 2 What is the ___ of hypothyroidism in the general population?
A getting
B going
C prevalence
D termination
- 3 It can cause a ___ of signs and symptoms.
A vary
B various
C variety
D war
- 4 These can reflect the ___ of central nervous system, for instance.
A induction
B instruction
C involvement
D interpretation
- 5 Also affected can be ___ nerves and muscles.
A ones
B peripheral
C preposterous
D interesting
- 6 Entrapment neuropathies and myopathies are most ___ observed.
A seriously
B frequently
C stealthily
D joyfully
- 7 Axonal sensorimotor polyneuropathy has been ___ in about 40% of patients.
A cared
B submitted
C recovered
D reported
- 8 This reflected the ___ of both large and small fibres.
A reporting
B standing
C cover
D recovery
- 9 Previous ___ said that replacement hormone treatment can improve symptoms.
A operations
B arrangements
C outstanding
D authors
- 10 ___ some patients neurophysiological abnormalities improved in about 3 months.
A To
B On
C In
D At
- 11 What do you know about the skin innervation ___ ?
A poles
B tact
C density
D dance
- 12 Its ___ with neuropathic pain remains partly unaddressed.
A relative
B relationship
C internship
D application
- 13 Painful neuropathies of different ___ have been studied.
A atmosphere
B aetiology
C treatment
D exclusion
- 14 Can serious neuropathies be diabetes-___ ?
A related
B refracted
C regained
D circled

- 15 Painful small fibre ____ have also been described.
 A neuropathies
 B nervousness
 C nerve
 D nervous
- 16 Whether subclinical hypothyroidism can affect peripheral nerves – remains ____ .
 A uncertain
 B additional
 C unintelligible
 D unemployed
- 17 Axonal neuropathy has been described in patients with normal thyroid hormone ____ .
 A lining
 B leukocytes
 C level
 D lenses
- 18 Are peripheral nerve ____ found in all patients with similar hormone dysfunctions?
 A examples
 B expectations
 C abnormalities
 D appearances
- 19 Do all patients ____ to replacement hormone therapy in the same manner?
 A share
 B respond
 C implant
 D constrict
- 20 Can pain ____ be achieved without any analgesic treatment?
 A increase
 B decrease
 C crease
 D exercise
- 21 It paralleled the improvement of sensory nerve ____ .
 A contrast
 B conglomerate
 C container
 D conduction
- 22 The ____ of cutaneous nerves also occurred.
 A thickened
 B painful
 C refrigeration
 D regeneration
- 23 Patients with pain had a lower innervation density than ____ without pain.
 A that
 B those
 C this
 D therapy
- 24 When can they ____ some improvement?
 A extract
 B experience
 C extinguish
 D expel
- 25 On the basis of the abovesaid, what can be currently ____ ?
 A instant
 B abandoned
 C positioned
 D assumed
- 26 The loss of IENF is associated with the ____ of developing neuropathic pain.
 A readership
 B renown
 C regime
 D risk
- 27 What is skin biopsy a ____ technique for?
 A reliable
 B relative
 C reveal
 D respiratory
- 28 It is a good technique ____ early neuropathy.
 A to detect
 B to project
 C detect
 D grafting
- 29 It is also a good technique to monitor its ____ .
 A present
 B prospective
 C progression
 D penalty
- 30 Therefore, it can be used as an outcome ____ to assess the response to treatments.
 A moisture
 B measure
 C multiplication
 D pleasure

Test 30

I'VE CAUGHT THAT NEW COMPUTER VIRUS!

- 1 She has an Internet history that ____ like an Anatomy textbook!
A writes
B reads
C supposes
D creates
- 2 She thinks that she has many different ____ .
A leukocytes
B ale
C ailments
D ally
- 3 Of course, there is a ____ for her condition.
A stimuli
B warn
C number
D name
- 4 It is called, as she puts it, *cyberchondria*, and it is ____ fast.
A standing
B spreading
C clinic
D membrane
- 5 She admits that she is ____ familiar with the symptoms of a brain tumour.
A overly
B medical
C clinically
D healthy
- 6 She also says that she has a rich ____ vocabulary.
A medicinal
B medical
C medicine
D drugs
- 7 Of course, she is not the only one who ____ from it!
A heal
B cures
C brings
D suffers
- 8 Psychologists reckon this is because men will not allow themselves to be ____ .
A criticise
B daily
C vulnerable
D clearance
- 9 Her personal ____ is that it is just laziness.
A opinion
B ophthalmologist
C opportunity
D obstacles
- 10 Women, naturally, have to remain ____ about everything.
A completion
B representing
C vigilant
D hospital
- 11 She says that women are the guardians of the family's ____ .
A healthy
B health
C helping
D handouts
- 12 She has been ____ with *cybechondria* for some time now.
A supporting
B healing
C struggling
D hoping
- 13 Her most recent ____ came when she was sent for a health MOT.
A suture
B session
C scar
D scare
- 14 This health MOT was for a work ____ .
A assignment
B aspiration
C assumption
D ambition

- 15 GPs spend the ____ of one day a week reassuring such patients.
 A equivalent
 B intensity
 C exquisite
 D external
- 16 Many of them turn ____ clutching reams of printed symptoms.
 A add
 B up
 C ad
 D on
- 17 These are the findings of a ____ by a hospital in London.
 A resource
 B research
 C respect
 D refraction
- 18 Such patients are ____ they are suffering from everything.
 A convinced
 B concluded
 C plastered
 D supposed
- 19 Yes, suffering from everything from Turner ____ to a TIA!
 A Retina
 B Axon
 C Syndrome
 D Sympathy
- 20 The abbreviation TIA stands here for Transitory Ischaemic ____ .
 A Atmosphere
 B Alignment
 C Alienation
 D Attack
- 21 She admits that the fact she even knows these words is ____ in itself.
 A wonder
 B worrying
 C wander
 D whine
- 22 Women are more likely ____ cyberchondriacs than men.
 A being
 B to be
 C extracted
 D perspire
- 23 What are the ____ of having a health check MOT?
 A inhibitors
 B benefits
 C introductions
 D business
- 24 What does the ____ MOT really stand for?
 A verb
 B shortage
 C acronym
 D opportunity
- 25 MOT is "Ministry Of ____ test for car safety".
 A Trade
 B Transport
 C Transit
 D Treatment
- 26 – You have a ____ of blood in your urine – the doctor said at one moment.
 A thorn
 B trace
 C tendon
 D tentacle
- 27 And he told her ____ worry about something like that!
 A no one to
 B noting
 C not to
 D nothing
- 28 Her husband was really less than ____ .
 A sympathy
 B sympathetic
 C sympathize
 D symptomatic
- 29 He calmly made her ____ the website again.
 A to check
 B chess
 C check
 D choice
- 30 Bladder cancer generally ____ in men over 70 who are heavy smokers.
 A arrives
 B posts
 C occurs
 D chooses

Test 31

IMAGES TRAVEL AS ELECTRICAL IMPULSES

- 1 The eye is a ___ organ, protected by a number of structures.
A strict
B careful
C different
D delicate
- 2 The skull bones form the walls of the eye ___ (cavity).
A form
B hole
C frame
D orbit
- 3 They protect more than half of the ___ part of the eyeball.
A weak
B worn
C previous
D posterior
- 4 The upper and lower eyelids aid in protecting the eye's ___ portion.
A anterior
B back
C side
D lateral
- 5 The eyelashes and eyebrow help to keep foreign ___ out of the eye.
A matter
B membrane
C master
D moment
- 6 The conjunctiva lines the inner ___ of the eyelids.
A surface
B surroundings
C crest
D stadium
- 7 It covers the visible portion of the ___ of the eye (sclera).
A whet
B white
C wet
D whole
- 8 Light ___ the eye through the cornea.
A enters
B escapes
C cares
D chances
- 9 Cornea is a ___ on the front surface of the eye.
A dome
B deed
C needle
D pipe
- 10 The cornea serves as a ___ covering for the front of the eye.
A traditional
B trade
C transparent
D tendon
- 11 It also helps ___ light on the retina at the back of the eye.
A form
B find
C focus
D frame
- 12 Having passed through the cornea, light ___ through the pupil.
A touches
B mixes
C travels
D slips
- 13 Pupil is the black ___ in the middle of the iris.
A dot
B stop
C full stop
D dart
- 14 Pupil is actually a ___ through the iris.
A whole
B hole
C pit
D part

- 15 Tears are produced by the so-called ____ glands.
 A endocrine
 B lacrimal
 C pituitary
 D lacteal
- 16 Tears lubricate the eye and contain an enzyme that protects ____ infection.
 A of
 B against
 C off
 D about
- 17 What is the name of the bony ____ that contains the eyeball?
 A roof
 B cranium
 C cavity
 D cave
- 18 It also contains muscles, nerves... and the structures that produce and ____ tears.
 A draw
 B drop
 C drain
 D develop
- 19 The eye has a relatively tough white outer ____ called sclera.
 A socket
 B cover
 C layer
 D stratum
- 20 The sclera is covered by a ____ mucous membrane.
 A thorough
 B tin
 C torn
 D thin
- 21 The conjunctiva runs to the ____ of the cornea.
 A fence
 B wall
 C effect
 D edge
- 22 It also covers the ____ back surface of the eyelids.
 A moist
 B most
 C moisture
 D mild
- 23 The iris is the ____ colored area of the eye.
 A circus
 B circular
 C careful
 D covered
- 24 It controls the ____ of light that enters the eye.
 A arrangement
 B angle
 C amount
 D aspect
- 25 As necessary, the pupil dilates (enlarges) and ____ (shrinks).
 A corrects
 B creases
 C circles
 D constricts
- 26 What is the size of the pupil ____ by?
 A controlled
 B performed
 C counted
 D presented
- 27 This is done by the action of the pupillary ____ muscle and dilator muscle.
 A sphere
 B sphincter
 C sclerotic
 D surgeon
- 28 By changing its ____, the lens focuses light onto the retina.
 A sway
 B state
 C shape
 D share
- 29 The most ____ part of the retina is a small area called the macula.
 A sensible
 B separated
 C serious
 D sensitive
- 30 The photoreceptors in the retina ____ the image into electrical impulses.
 A certify
 B construct
 C collect
 D convert

Test 32

INFECTIOUS DISEASES

- 1 Many diseases are caused by a ___ or remote invasion or infection.
A recent
B pregnant
C close
D modern
- 2 The word is of infection of the ___ by a parasite.
A microorganism
B test
C tissue
D healing
- 3 In case of an infection, that parasite is the so-called ___ organism.
A cardinal
B carefree
C caustic
D causal
- 4 The parasite is potentially transmissible from one ___ to another.
A host
B guest
C star
D hostage
- 5 This is exactly why such diseases are ____ .
A festering
B infested
C infective
D dressed
- 6 Among them are some caused by ___ transmissible specific parasites.
A upward
B downward
C steadily
D readily
- 7 Such specific, or ___ specific, infectious diseases are known as "fevers".
A cute
B acute
C standard
D certified
- 8 Does a carrier necessarily ___ from the specific disease?
A care
B create
C suffer
D become
- 9 A carrier is one who harbours and potentially spreads ___ parasites.
A ready
B harmful
C round
D allmighty
- 10 The carrier state may ___ for a varying period.
A perform
B project
C pretend
D persist
- 11 Yes, for a varying period after a ___ clinical attack of the disease.
A frank
B false
C favourable
D feverish
- 12 Such persons are ___ "convalescent carriers".
A nicknamed
B termed
C mentioned
D meant
- 13 Persons who have passed through no ___ clinical attack can be immune to the disease.
A popular
B recognisable
C reddish
D reminding
- 14 Yes, they can ___ specific organisms and be immune to the disease.
A drag
B wear
C carry
D lift

- 15 "Fever" imply ___ temperature and quickened pulse, of course.
 A excellent
 B intensified
 C raised
 D risen
- 16 Infection is commonly ___ from one person to another.
 A requested
 B called
 C counted
 D conveyed
- 17 In the so-called enteric group of diseases infection is ___ by articles of drink or food.
 A satiated
 B stated
 C spread
 D swayed
- 18 In plague, typhus, and malaria infection is ___ by the medium of infected insects.
 A transmitted
 B translated
 C transformed
 D transplanted
- 19 How can sneezing and coughing ___ dangerous?
 A pretend
 B list
 C move
 D prove
- 20 With sneezing and coughing, ___ of droplets are projected through short distances.
 A bars
 B extremes
 C rays
 D sprays
- 21 The role played by fomites is ___ increasing importance.
 A assuming
 B understanding
 C differing
 D occurring
- 22 *Fomites* is the ___ term referring to utensils, bedding, letters, dust, etc.
 A neurological
 B proficiency
 C collective
 D conductive
- 23 For them we say that they are ___ or contact carriers.
 A heat
 B healthy
 C sick
 D health
- 24 Their immunity has been ___ by small repeated sub-clinical doses of infection.
 A learned
 B exported
 C acquired
 D purchased
- 25 The carrier state may be transient or ____ .
 A preposterous
 B purposeful
 C predominant
 D permanent
- 26 The so-called non-___ may carry temporarily.
 A immunes
 B immunity
 C immunization
 D immense
- 27 *Temporarily* here means during ___ infection or while incubating the disease.
 A late
 B latent
 C latest
 D lasting
- 28 ___ infection and clinical attack is a period termed the incubation period.
 A Meantime
 B Before
 C Between
 D After
- 29 During incubation the organisms are ____ .
 A separating
 B adding
 C managing
 D multiplying
- 30 They finally overcome the ___ of the host and initiate a complex of symptoms and signs.
 A residence
 B repertoire
 C reference
 D resistance

Test 33

IS ALCOHOL GOOD FOR YOU?

- 1 Most ____ can drink some quantities of alcohol, it is true.
A adults
B advantages
C areas
D advances
- 2 What does ____ quantities mean to you?
A *morning*
B *moderate*
C *measure*
D *more*
- 3 Do you agree with “up to two drinks ____ day“ for men?
A on
B while
C per
D with
- 4 And how many drinks ____ women and older people?
A per
B for
C post
D in
- 5 Is sticking to these quantities really enough ____ alcohol-related problems?
A to evade
B to avoid
C avoiding
D evading
- 6 Did you know that one drink ____ one 12-ounce bottle of beer?
A escapes
B evades
C equals
D arranges
- 7 However, ____ people should not drink at all.
A carefree
B certain
C brilliant
D certified
- 8 This holds true even when differences in body weight are ____ into account.
A vaccinated
B forbidden
C shaken
D taken
- 9 Women’s bodies have ____ less water than men’s bodies.
A previously
B predominantly
C purportedly
D proportionately
- 10 When one drinks alcohol, it ____ with the body water.
A molests
B maintains
C mixes
D makes
- 11 A given amount of alcohol becomes more highly ____ in a woman’s body.
A concentrated
B comprehended
C corrected
D counted
- 12 This is why the recommended drinking ____ for women is lower than for men.
A limb
B limit
C length
D leather
- 13 In addition, chronic alcohol ____ takes a heavier physical toll on women than on men.
A misunderstanding
B misuse
C abuse
D usage
- 14 And what about alcohol ____ and the related medical problems?
A impertinence
B dependant
C dependence
D dependent

- 15 What about women who are pregnant or ___ to become pregnant?
 A expert
 B interested
 C trying
 D stating
- 16 Should people who plan to ___ drink at all?
 A adjoin
 B sympathize
 C drive
 D try
- 17 Is drinking good for those engaging in activities requiring ___ and skill?
 A atmosphere
 B abandoning
 C alertness
 D animosity
- 18 What to say about people ___ certain medications who decide to drink?
 A examining
 B eating
 C taking
 D making
- 19 Does the same answer apply in case of over-the-___ medicines?
 A dose
 B drug
 C measure
 D counter
- 20 And what about people with medical conditions that can be ___ by drinking alcohol?
 A exploded
 B exploited
 C discussed
 D worsened
- 21 Is it true that women and men are affected ___ ?
 A differently
 B difficulty
 C differing
 D demonstration
- 22 Women become more ___ than men after drinking the same amount of alcohol.
 A intelligent
 B intoxicated
 C impressed
 D improper
- 23 The related medical problems include brain and ___ damage, in the first place.
 A live
 B life
 C liver
 D living
- 24 Of course, such problems ___ more rapidly in women than in men.
 A prolong
 B protrude
 C progress
 D provoke
- 25 Can there possibly be a ___ answer to what is a safe level of drinking?
 A definite
 B dedicated
 C devoted
 D downward
- 26 Studies have reported that moderate ___ are less likely to develop a heart disease.
 A drinkers
 B drinking
 C downstairs
 D demonstratives
- 27 Small amounts of alcohol may help protect ___ coronary heart disease!
 A after
 B against
 C about
 D away
- 28 They do that by raising levels of the so-called "good" HDL ____ .
 A cloramphenicol
 B creatinine
 C cholesterol
 D creation
- 29 Also reduced is the risk of blood ___ in the coronary arteries.
 A clefts
 B clearance
 C clouds
 D clots
- 30 If you are a nondrinker, you should not start drinking only to ___ your heart!
 A benefit
 B forget
 C heal
 D inspire

Test 34

**THE LARGEST LYMPHATIC ORGAN
IN THE BODY**

- 1 What are lymphatic ___ characterized by?
A orders
B organs
C options
D opportunities
- 2 They are characterized by ___ of lymphocytes and other cells.
A cores
B clusters
C cords
D caverns
- 3 These cells are enmeshed in a framework of short, branching ___ tissue fibers.
A complete
B collateral
C connective
D competitive
- 4 The lymphocytes ___ in the red bone marrow.
A originate
B operate
C co-operate
D coordinate
- 5 They are carried in the blood from the bone marrow to the ___ organs.
A own
B lymphatic
C careful
D lacrimal
- 6 What happens when the body is exposed to ___ and other foreign substances?
A microfibrils
B obstacles
C microorganisms
D fibers
- 7 Then the lymphocytes proliferate within lymph ___, tonsils, spleen, thymus.
A noodles
B positions
C nodes
D section
- 8 Spleen is ___ in the upper left abdominal cavity.
A located
B lateral
C stated
D started
- 9 It is in the abdominal cavity, just ___ the diaphragm, and posterior to the stomach.
A by
B beneath
C over
D up
- 10 It is ___ to a lymph node in shape and structure.
A surgical
B divided
C similar
D former
- 11 However, the spleen is much ___ than a lymph node.
A brighter
B easier
C larger
D largest
- 12 Do you know what this lymphatic organ is ___ by?
A surrendered
B suspended
C surrounded
D supposed
- 13 A connective tissue capsule extends inward to divide the organ ___ lobules.
A onto
B on
C in the
D into
- 14 The spleen consists of two ___ of tissue – *white pulp* and *red pulp*.
A types
B tyres
C manners
D lancets

- 15 They are sent in the blood to the site of the ____ .
 A information
 B intensity
 C invasion
 D investigation
- 16 Lymph nodes are bean-shaped ____, usually less than 2.5 cm in length.
 A aspects
 B systems
 C structures
 D articles
- 17 We know that they are widely ____ throughout the body.
 A demonstrated
 B operated
 C stimulated
 D distributed
- 18 Yes, they can be ____ throughout the body, except for the central nervous system.
 A examined
 B extracted
 C finished
 D found
- 19 They are positioned along the lymphatic ____ where they filter the lymph.
 A seats
 B cervix
 C partners
 D pathways
- 20 They filter the lymph before it is ____ to the blood.
 A exploited
 B engaged
 C returned
 D sucked
- 21 What are the three ____ regions of the body where *lymph nodes* tend to cluster?
 A deep
 B superficial
 C internal
 D voluminous
- 22 The *axillary nodes* are found in the ____ .
 A armpits
 B arms
 C legs
 D lungs
- 23 The red pulp consists of venous sinuses filled with blood and ____ of lymphatic cells.
 A capsules
 B cords
 C cases
 D corks
- 24 Blood ____ the spleen through the splenic artery.
 A evades
 B enters
 C avoids
 D attracts
- 25 It is filtered in the sinuses, and then ____ through the splenic vein.
 A lives
 B leaves
 C left
 D loads
- 26 The spleen filters blood in much the ____ way the lymph nodes filter lymph.
 A sequence
 B serious
 C same
 D systematic
- 27 Lymphocytes in the spleen ____ to pathogens in the blood and attempt to destroy them.
 A react
 B reach
 C recover
 D redeem
- 28 Macrophages then engulf the resulting debris, the damaged cells, and the other large ____ .
 A particles
 B parts
 C production
 D changes
- 29 The spleen, along with the liver, ____ old erythrocytes from the circulating blood.
 A reforms
 B removes
 C repeats
 D resorts
- 30 The sinuses in the spleen are a ____ for blood.
 A recess
 B reservoir
 C review
 D report

Test 35

LYMPHATIC SYSTEM

- 1 Do you know what the lymphatic system ___ of?
A consists
B contains
C completes
D connects
- 2 It includes a fluid – lymph, vessels that ___ lymph, and lymphoid tissue organs.
A transport
B convert
C compress
D transform
- 3 The lymphatic system is an ___ and interconnected system.
A expensive
B expansive
C expressive
D extensive
- 4 The system contains vessels, spaces, and nodes in the body which ___ lymph.
A capture
B corrode
C convert
D circulate
- 5 This system is very important because lymph ___ a number of vital functions in the body.
A penetrates
B performs
C produces
D prevails
- 6 The lymph's functions are especially important in the ___ of the immune system.
A storage
B context
C appliance
D application
- 7 Lymph is a fluid similar in ___ to blood plasma.
A coordination
B care
C composition
D certainty
- 8 First of all, lymph returns ___ interstitial fluid to the blood.
A extreme
B export
C excerpt
D excess
- 9 Of the fluid that ___ the capillary, about 90 per cent is returned.
A rounds
B appraises
C underlines
D leaves
- 10 The 10 per cent that does not return becomes ___ of the interstitial fluid.
A part
B cradle
C valve
D syringe
- 11 Interstitial fluid is the fluid that ___ the tissue cells.
A surrounds
B invests
C implements
D touches
- 12 Small protein molecules may "leak" ___ the capillary wall.
A thoroughly
B through
C tough
D to
- 13 In this manner the ___ pressure of the interstitial fluid can be increased.
A atmospheric
B osmotic
C extreme
D exposition
- 14 This further ___ the return of fluid into the capillaries.
A inserts
B inhibits
C infects
D implodes

- 15 Did you know that lymph is in fact ___ from blood plasma?
 A derived
 B deprived
 C defined
 D dispersed
- 16 Yes, and this happens as fluids pass through capillary ___ at the arterial end.
 A walls
 B stations
 C manners
 D heaps
- 17 Unlike the blood, lymph does not have a ___ pump.
 A certain
 B central
 C compulsory
 D careful
- 18 Instead of that, it relies ___ muscle contractions.
 A at
 B on
 C to
 D into
- 19 Also other natural functions in the body are there to ___ lymph through the system.
 A found
 B free
 C force
 D face
- 20 Lymph is eventually ___ into the thoracic duct.
 A dreamed
 B devoted
 C drained
 D devastated
- 21 The thoracic duct ___ lymph back to the heart.
 A demonstrates
 B diffuses
 C differentiates
 D brings
- 22 The lymphatic system has in fact three ___ functions.
 A thorough
 B potential
 C express
 D primary
- 23 When does fluid ___ to accumulate in the tissue spaces?
 A thrive
 B torrent
 C tend
 D take
- 24 Increase in the ___ of tissue fluid results in edema, i.e. swelling.
 A wave
 B weariness
 C volume
 D versatility
- 25 Lymph capillaries ___ the surplus interstitial fluid and proteins.
 A pick up
 B draw
 C draw up
 D pick
- 26 ___ the fluid enters the lymph capillaries, it is called lymph.
 A Contrary
 B However
 C About
 D After
- 27 The lymphatic system also ___ fats and fat-soluble vitamins from the digestive system.
 A absorbs
 B makes
 C ignores
 D produces
- 28 Subsequently, it transports these ___ to the venous circulation.
 A substances
 B segments
 C prospects
 D creams
- 29 The mucosa that lines the small ___ is covered with fingerlike projections called villi.
 A interface
 B intestine
 C testosterone
 D thorax
- 30 The best known function of the lymphatic system is ___ against invading microorganisms.
 A destruction
 B defense
 C absorption
 D wiping

Test 36

THE MEDIUM OF TRANSPORT IN THE BODY

- 1 What is the name of the human blood's fluid ____ ?
A option
B density
C aspect
D portion
- 2 The plasma is composed ____ of water, we know that.
A presently
B primarily
C potentially
D positively
- 3 All the important ____ are transported in the plasma.
A portions
B materials
C needs
D nutrients
- 4 The same applies to hormones, ____ proteins, and waste products.
A synthetic
B connected
C old
D clotting
- 5 Red blood cells and white blood cells are also ____ in the plasma.
A occupied
B surrounded
C suspended
D determined
- 6 Erythrocytes are disk-shaped ____ produced in the bone marrow.
A circles
B cells
C clots
D balls
- 7 Erythrocytes have no nucleus, and their cytoplasm is ____ with hemoglobin.
A filed
B flawed
C fringed
D filled
- 8 The remainder of the hemoglobin ____ to bilirubin.
A cleans
B clears
C connects
D converts
- 9 Bilirubin is the chief pigment in ____ bile, which is produced in the liver.
A rounded
B certain
C human
D arranged
- 10 Red blood cells ____ have antigens on their surface.
A cardinally
B commonly
C nominally
D temporarily
- 11 Leukocytes are ____ larger than red blood cells.
A strongly
B instantly
C probably
D generally
- 12 Leukocytes, white blood cells, have clearly ____ nuclei.
A dressed
B operated
C sketched
D defined
- 13 They are also produced in the bone marrow and have various ____ in the body.
A frequencies
B functions
C formulas
D formulae
- 14 Lymphocytes are essential ____ of the immune system.
A improvements
B products
C structures
D components

- 15 Hemoglobin is a red-pigmented ____, we learned it the other day.
 A extract
 B solution
 C protein
 D suspension
- 16 Hemoglobin ____ loosely to oxygen atoms and carbon dioxide molecules.
 A boards
 B binds
 C blends
 D bends
- 17 It is the mechanism of ____ of these substances.
 A limiting
 B undermining
 C tradition
 D transport
- 18 Do you know the answer to what ____ to carbon-monoxide poisoning?
 A lacks
 B loads
 C leads
 D leaks
- 19 A red blood cell ____ for about 120 days and is then destroyed in the spleen.
 A counts
 B circulates
 C moves
 D sucks
- 20 Spleen is an organ ____ near the stomach.
 A loaded
 B exposed
 C terminated
 D located
- 21 When a red blood cell is destroyed, its ____ component is preserved.
 A stone
 B wood
 C iron
 D steel
- 22 This component is preserved for ____ in the liver.
 A abuse
 B reuse
 C misuse
 D usage
- 23 Other cells – neutrophils and monocytes – ____ primarily as phagocytes.
 A cool
 B heat
 C introduce
 D function
- 24 This means that they attack and ____ invading microorganisms.
 A invite
 B call
 C engulf
 D extract
- 25 The ____ white blood cells are eosinophils and basophils.
 A resumed
 B aspiring
 C protected
 D remaining
- 26 Basophils ____ to function in allergic responses.
 A are blamed
 B are believed
 C are taught
 D believe
- 27 Platelets are small disk-shaped blood ____ produced in the bone marrow.
 A frictions
 B fragments
 C fractions
 D fractures
- 28 Thrombocytes ____ as the starting material for blood clotting.
 A serve
 B sway
 C play
 D contain
- 29 The platelets ____ to damaged blood vessel walls.
 A adhere
 B attract
 C assemble
 D assume
- 30 Thromboplastin ____ other clotting factors in the blood.
 A activates
 B invites
 C applies
 D works

Test 37

THE MIND MAKING THE BODY ILL

- 1 Do you ___ that it is the mind that can make the body ill?
A explain
B believe
C interrupt
D hesitate
- 2 Psychosomatic illnesses are those that have a mental origin but are nevertheless ____ .
A optimistic
B organic
C general
D surgical
- 3 Of course, there long existed no precise scientific ___ of this.
A guess
B proof
C disbelief
D management
- 4 Despite this fact, an ___ as to their existence has always been strong.
A opinion
B observer
C opening
D opportunity
- 5 It has been present and strong since the days of ___ Greece.
A ultimate
B ancient
C another
D interior
- 6 In recent times various drug preparations were supposed to ___ these sicknesses.
A obtain
B overcome
C outplay
D outnumber
- 7 Various drug preparations have been concocted, and some success was ____ .
A caressed
B experienced
C behaved
D counted
- 8 *Psycho* refers to mind, and *somatic* refers to ____ .
A birth
B senseless
C sense
D body
- 9 What is the term for illnesses created ___ in the body by derangement of the mind?
A presently
B previously
C psychologically
D physically
- 10 When do such diseases become ___ to cure?
A immune
B representative
C susceptible
D circulating
- 11 They can be cured when one has ___ the problem of human aberration.
A resolved
B re-sold
C reinforced
D reacted
- 12 Arthritis, dermatitis, allergies, asthma, ... form a very small ___ of the psychosomatic catalogue.
A septum
B separate
C section
D secret
- 13 Bizarre aches and pains in various ___ of the body are generally psychosomatic.
A positions
B pests
C portions
D presents
- 14 About 70% of the current list of diseases ___ into the category of psychosomatic ones.
A fall
B presume
C report
D include

- 15 That success was sufficient to warrant a great deal of work on the part of ____ .
 A researchers
 B nurses
 C courses
 D statesmen
- 16 Peptic ulcers are in fact open ____ in the stomach.
 A stores
 B sores
 C stocks
 D systems
- 17 A drug called ACTH is in fact a ____ of hormone.
 A part
 B kind
 C portion
 D hemisphere
- 18 ACTH was once used to ____ symptoms of rheumatoid arthritis.
 A cancel
 B create
 C combat
 D collect
- 19 It was believed to stimulate the ____ of other hormones in the body.
 A penetration
 B preparedness
 C precipitation
 D production
- 20 That drug has had astonishing but wildly ____ results.
 A universal
 B unintelligible
 C unprecedented
 D unpredictable
- 21 Allergies have been found to yield more or less to things which ____ histamine.
 A determined
 B oriented
 C obtained
 D depressed
- 22 Histamine is a chemical ____ in the tissues that causes many allergic reactions.
 A compound
 B painkiller
 C execution
 D performance
- 23 It is ____ that more illnesses are psychosomatic than have been so classified to date.
 A carefree
 B common
 C certain
 D close
- 24 How many more can be so classified is difficult ____ .
 A protected
 B precaution
 C to predict
 D predictable
- 25 To say that all illnesses are psychosomatic is, of course, ____ .
 A absolute
 B absurd
 C abandoned
 D arranged
- 26 There exist, after all, life forms called ____, haven't you heard of them?
 A gurgles
 B germanium
 C germs
 D genetics
- 27 And these life forms, naturally, have ____ as *their* goal.
 A survival
 B infusion
 C surgery
 D anaesthesia
- 28 *Autogenetic* illness ____ within the organism and is self-generated.
 A generates
 B originates
 C protects
 D creates
- 29 *Exogenetic* illness is a one whose origin was ____ .
 A invented
 B adverse
 C exterior
 D formulated
- 30 *Perpetuation* relates to the factors which cause the sickness ____ .
 A to continue
 B commonplace
 C continuous
 D cervical

Test 38

**MINIMIZE THE PRESSURE
ON THE SPINAL CORD**

- 1 He said that they had ___ the man into the hospital.
A get
B to refuse
C to get
D admit
- 2 At that moment they suspected a ___ spine.
A growing
B fractured
C bone
D column
- 3 This ___ that they had to move him very carefully.
A wore
B made
C scissored
D meant
- 4 All five of them had ___ him onto the stretcher together.
A reasoned
B cared
C to lift
D to combine
- 5 Everybody's ___ was appreciated at that moment.
A opinions
B assistance
C aspire
D deteriorate
- 6 Everything was clear, and there was no ___ argument.
A foreign
B former
C farther
D further
- 7 Crest then followed the ___ to the hospital.
A berth
B position
C brilliance
D ambulance
- 8 He was thinking about what had to be done to prevent new damage to the spinal ____ .
A chamber
B cone
C circumference
D cord
- 9 He knew that rolling the patient on a hard X-ray ___ could be dangerous.
A roller
B aspirator
C threshold
D table
- 10 A ___ X-ray could be taken with the patient still in bed.
A prospective
B potential
C portable
D possible
- 11 However, this would also ___ some motion of the back.
A implement
B interpret
C involve
D insert
- 12 A portable X-ray may be of ___ technical quality, he knew that.
A prenatal
B potential
C poor
D pale
- 13 He did not know what bones were fractured and to ___ extent.
A which
B what
C where
D whose
- 14 When a ___ of loose bone is sticking into the spine, it ought to be removed.
A fragment
B proportion
C fracture
D member

- 15 There he supervised the ____ of the patient onto the bed.
 A expression
 B transitory
 C transfer
 D transport
- 16 After that, an oxygen ____ was ordered.
 A tentacle
 B tent
 C court
 D team
- 17 Crest immediately ____ an intravenous.
 A stitched
 B stated
 C started
 D surrounded
- 18 He ____ arrangements for a blood transfusion to follow.
 A exemplified
 B got
 C did
 D made
- 19 The transfusion was necessary ____ to overcome the element of shock.
 A for order
 B in order
 C ordered
 D arranged
- 20 After that he had some other decisions ____ .
 A foundations
 B to make
 C making
 D to find
- 21 An important question was that of whether X-rays should ____ .
 A take
 B be taken
 C be made
 D verified
- 22 They knew, of course, that ____ of the back had to be prevented.
 A measure
 B motionless
 C motion
 D motive
- 23 This type of decision was frequently encountered in an ____ .
 A emergency
 B urgency
 C extension
 D ultimatum
- 24 The question really was: whether to be conservative or ____ ?
 A reported
 B operational
 C radical
 D insane
- 25 If he did nothing, and there were poor results, he would be open to ____ .
 A critical
 B critics
 C criticism
 D crisis
- 26 Yes, yes, Parky's attitude had left no ____ of that.
 A doubt
 B dubious
 C disturbance
 D distribution
- 27 In this ____ case, it seemed that a poor result was inevitable.
 A particular
 B perpendicular
 C proverb
 D partial
- 28 The specialist was very pleasant, very ____ .
 A reassuring
 B random
 C irrational
 D insidious
- 29 The patient's ____ was such that he could not be transferred.
 A intravenous
 B biography
 C condition
 D collateral
- 30 There was nothing else to do but ____ and hope and, possibly, pray.
 A sight
 B see
 C wash
 D watch

Test 39

MONITORING DISEASE ACTIVITY IN MS

- 1 Multiple sclerosis is a ___ disorder of the central nervous system.
A probable
B disabling
C antagonistic
D honorary
- 2 Inflammation, demyelination, and axonal degeneration are characteristic ____ .
A circumstances
B pathologies
C preconditions
D generations
- 3 They contribute ____ to neurological deficits.
A traditionally
B knowingly
C daily
D directly
- 4 Inflammation and demyelination can result ____ temporary deficits.
A in
B at
C to
D from
- 5 The word is of deficits such as those ____ during relapses.
A occurring
B away
C obtaining
D deranging
- 6 Axonal degeneration is ____ to result in a permanent loss of function.
A like
B low
C lonesome
D likely
- 7 The slow ____ of disability characterizes the progressive phase of the disease.
A accumulation
B advantage
C appreciation
D apparatus
- 8 What can you tell us about the magnetic ____ imaging?
A resonance
B reasoning
C respiratory
D restitution
- 9 MRI is a useful tool for ____ disease activity in MS.
A momentary
B monitoring
C cardiac
D grafting
- 10 MRI may ____ a marker of ongoing axonal loss.
A circle
B compensate
C provide
D prove
- 11 The word is of a ____, sensitive and early marker of ongoing axonal loss.
A revealed
B reported
C radiology
D reliable
- 12 This is, by implication, also the marker of disease ____ .
A progression
B protrusion
C protuberance
D prolactinoma
- 13 What do ____ studies compare?
A receipt
B rely
C recent
D recently
- 14 They compare atrophy within cerebral grey and white ____ compartments in MS.
A measure
B monitor
C master
D matter

- 15 Has there been any ____ in development of therapies?
 A prospect
 B progress
 C precipitation
 D positioning
- 16 There are some new therapies for suppressing inflammatory white matter ____ .
 A legions
 B regimes
 C lesions
 D regions
- 17 As yet, there is no ____ disease modifying treatment for progressive forms of MS.
 A affects
 B effect
 C affection
 D effective
- 18 What happens new with the emergence of potential neuroprotective and reparative ____ ?
 A agents
 B experts
 C agencies
 D extracts
- 19 It is ____ that therapies for progressive forms of MS will be identified.
 A hopped
 B hoped
 C helped
 D hope
- 20 However, clinical trials in progressive MS are large, expensive, and ____ .
 A external
 B excerpt
 C prolonged
 D prohibited
- 21 This applies to trials that use disability scales as the primary ____ measure.
 A outpatient
 B outcome
 C otitis
 D outrageous
- 22 The problem lies in the limited ____ of the scales that are currently used.
 A sensibility
 B sense
 C sensitivity
 D sentence
- 23 They have shown a more ____ atrophy within the gray zone.
 A marked
 B linked
 C learned
 D mastered
- 24 The word is also of a more clinically ____ atrophy.
 A relevant
 B radiant
 C rodent
 D reflected
- 25 Can you tell us anything about a ____ treatment effect of interferon?
 A beneficial
 B benign
 C poison
 D polen
- 26 It has been demonstrated in a small cohort of ____ .
 A pedestrians
 B patients
 C poles
 D predators
- 27 However, most studies have investigated ____ with relatively early disease.
 A objects
 B subjects
 C personifications
 D formulations
- 28 The clinical relevance of atrophy later in the ____ of the disease is not known.
 A curse
 B cone
 C course
 D creativity
- 29 Other studies have ____ on atrophy occurring within selected axial slices.
 A formation
 B forbidden
 C focused
 D frustrated
- 30 The rate of tissue ____ may be greater in this region compared with the whole brain.
 A loose
 B loss
 C lobe
 D leave

Test 40

THE MYSTERIES OF THE ORGANISM

- 1 Eric Kandel's interest in the mind is driven by two ___ memories.
A obsessive
B opportune
C orbiting
D osteoporotic
- 2 When he was nine, they were ___ of the family's Viennese apartment.
A thrown
B thrown out
C throbbed
D thirsty
- 3 That happend ___ the time of the *Kristallnacht*.
A while
B away
C around
D under
- 4 The second memory related to a furtive ___ seduction by the family's housekeeper.
A attempted
B atmospheric
C attributable
D atrophic
- 5 Shortly afterwards that girl ran off to Czechoslovakia with the gas ____ .
A repairman
B reporter
C respiration
D radiologist
- 6 At that time this meant for him "devoting one's life to the happy pursuit of ____".
A scattering
B scarring
C sensuality
D sensibility
- 7 For years, he believed that running off to Czechoslovakia meant ___ that.
A extraordinary
B exemplary
C effortless
D exactly
- 8 *Aplysia* is a marine ___ more than a foot in length.
A chemical
B certificate
C crest
D creature
- 9 It is more than a foot in length, ___ several pounds.
A weightless
B weighting
C waiting
D weighing
- 10 *Aplysia* has only about 20,000 cells in its ____ .
A stain
B brain
C border
D chamber
- 11 Some of them are so large that they can be seen with the ___ eye.
A naked
B nude
C nook
D normal
- 12 These cells of *Aplysia* can easily be ____, you know.
A determined
B dissected
C downloaded
D donated
- 13 It is also possible to measure their ___ characteristics.
A electronic
B electrocution
C electrical
D electronically
- 14 It was known that simple ___ involve three nerve cells.
A reflexes
B reflections
C reports
D refractions

- 15 He, however, devoted his life to understanding the physical ___ of memory.
 A base
 B bases
 C bass
 D basis
- 16 He found himself in the US before the start of ___ in Europe.
 A hospitality
 B households
 C hospitals
 D hostilities
- 17 Transplanted to the US, he was ___ at Harvard.
 A exposed
 B educated
 C extinguished
 D expressed
- 18 He gravitated first ___ psychoanalysis.
 A from
 B towards
 C to
 D for
- 19 However, he soon ___ something very important.
 A reflected
 B realised
 C reminded
 D retorted
- 20 Understanding the biological side of memory ___ something simple...
 A required
 B requested
 C redeemed
 D reassured
- 21 Simpler techniques than Freudian ___ were needed.
 A analysis
 B dialysis
 C disproportions
 D antagonisms
- 22 He opted ___ single nerve cells in the giant marine snail *Aplysia*.
 A station
 B to study
 C to station
 D study
- 23 One cell is sensory, one intermediate, and one to ___ a muscular response.
 A arrest
 B trigger
 C press
 D train
- 24 The synapses are in fact the ___ between the nerve cells.
 A gates
 B granules
 C gaps
 D grates
- 25 The synapses are ___ by chemicals called neurotransmitters.
 A broadened
 B brought
 C betrayed
 D bridged
- 26 Kandel was ___ to show what short-term memory really is.
 A potential
 B portrayed
 C able
 D arranged
- 27 Short-term memory is the result of a ___ in the connections between the cells.
 A strengthening
 B stadium
 C shortening
 D shortage
- 28 He also showed that genes have to be ___ to create long-term memories.
 A switched off
 B swayed
 C switched on
 D switched
- 29 It was for these ___ that Kandel won the 2000 Nobel Prize in Physiology of Medicine.
 A discoveries
 B determinants
 C debuts
 D deformities
- 30 *In Search of Memory* is his book explaining the ___ of a new science of mind.
 A emergency
 B emergence
 C emphasizing
 D empathy

Test 41

NOT A PROBLEM – FOR THE MOTHER

- 1 At that moment he ____ her to listen to him very carefully.
A asked
B dominated
C advanced
D deleted
- 2 A baby's blood is always quite ____ from the mother's.
A separate
B special
C sophisticated
D soluble
- 3 What can, nevertheless, ____ in pregnancy?
A accept
B try
C consist
D happen
- 4 Small amounts of the baby's blood often escape into the mother's blood ____ .
A sentence
B spot
C station
D stream
- 5 What if the mother is Rh negative and the baby ____ to be Rh positive?
A applies
B happens
C contains
D decides
- 6 Who do you ____ is that "old friend" called *big D*?
A call
B think
C arrange
D ask
- 7 Sometimes that "old friend" ____ into the mother's blood.
A stands
B sips
C seeps
D skips
- 8 Despite that, the antibodies can, and do, cross over ____ freely.
A quiet
B quantity
C quantum
D quite
- 9 Does this ____ the antibodies would start fighting with the baby's blood?
A mean
B more
C mourn
D mount
- 10 Yes, she had it now ____ in her mind.
A clean
B clearly
C cleanliness
D condition
- 11 At that moment the doctor ____ at her admiringly.
A seen
B watched
C looked
D saw
- 12 This is one ____ girl, he thought.
A certificate
B much
C meaning
D smart
- 13 He was sure that she had not ____ a thing.
A missed
B meaning
C making
D mystery
- 14 The antibodies ____ destroy the baby's blood, or part of it, if we let them.
A must
B might
C made
D master

- 15 Of course, that "old friend" is not ___ in the mother's blood.
 A well
 B willing
 C welcome
 D while
- 16 When that happens, the mother's blood usually ___ something we call antibodies.
 A creates
 B craves
 C condenses
 D corrupts
- 17 Those antibodies ___ the *big D* and eventually destroy it.
 A form
 B fight
 C fright
 D freight
- 18 At that moment she was ___ puzzled.
 A bit
 B beet
 C a bit
 D bound
- 19 He ___ that there never was any problem – for the mother.
 A prevented
 B connected
 C talked
 D said
- 20 When does the problem, if there is one, ___ ?
 A begin
 B belong
 C betray
 D ban
- 21 What happens when the antibodies cross over the placental ___ ?
 A bonus
 B barrier
 C bed
 D bath
- 22 Of course, there is no regular ___ of blood between mother and baby.
 A tendency
 B activity
 C movement
 D stream
- 23 He ___ that the condition was called *Erythroblastosis Foetalis*.
 A aided
 B distracted
 C added
 D divided
- 24 Unfortunately, if it ___ happen we can not stop it.
 A starts
 B needs
 C do
 D does
- 25 However, the good thing still is that we can ___ it.
 A afraid
 B combat
 C subtraction
 D combatant
- 26 The first ___ is the one we get through a blood-sensitization test.
 A warning
 B warmth
 C warming
 D winner
- 27 That test will be done on your blood, now and later during your ___ .
 A pregnant
 B medicine
 C drug
 D pregnancy
- 28 Your husband will know more about the lab ___ than I do!
 A produce
 B condition
 C procedure
 D script
- 29 The most important thing is to give the baby an ___ transfusion of the right kind of blood.
 A explicit
 B exchange
 C experimental
 D explanatory
- 30 The transfusion of the right kind of blood is necessary immediately after ___, of course.
 A born
 B borne
 C birth
 D birth rate

Test 42

NOT BIGGER THAN A FIST!

- 1 The human heart has a ____ of between 250 and 350 grams.
A fist
B weigh
C material
D mass
- 2 It is enclosed in a double-walled ____ sac.
A protective
B personal
C practical
D perambulator
- 3 That double-walled sac is called the ____ .
A peritonitis
B cardiac
C pericardium
D myocarditis
- 4 What does its double membrane consist ____ ?
A from
B with
C of
D off
- 5 It consists of the pericardial ____ which nourishes the heart.
A fluency
B flow
C fluid
D juice
- 6 In addition to nourishing the heart, it also prevents heart from ____ .
A streams
B stops
C stress
D shocks
- 7 The superficial part of this sac is called the ____ pericardium.
A careful
B fibrous
C forensic
D certain
- 8 The epicardium, or visceral pericardium, is the name of the ____ layer.
A outside
B obvious
C outer
D obstetrician
- 9 The ____ layer is called the myocardium.
A marked
B media
C middle
D medium
- 10 The myocardium is composed of muscle which ____ .
A contracts
B complicates
C circles
D cares
- 11 The inner layer is in contact with the blood that the heart ____ .
A puts
B pumps
C positions
D palpates
- 12 It ____ with the inner lining of blood vessels.
A mediates
B mixes
C maintains
D merges
- 13 We know that it also covers the heart ____ .
A valves
B wrinkles
C wills
D wrists
- 14 Did you know that the human heart has four ____ ?
A connections
B chambers
C cells
D crowns

- 15 The fibrous pericardial sac is itself lined with the outer ____ of the serous pericardium.
 A leather
 B lentils
 C lens
 D layer
- 16 This is in fact a ____ (fibrous-parietal-pericardial) sac.
 A constant
 B constructed
 C composite
 D collected
- 17 This sac protects the heart and ____ its surrounding structures.
 A assumes
 B attracts
 C attacks
 D anchors
- 18 Yes, and it also ____ overfilling of the heart with blood.
 A prevents
 B protects
 C presents
 D projects
- 19 Is the inner surface a ____ lubricated sliding surface?
 A smooth
 B stout
 C mean
 D proof
- 20 Within it the heart organ can move in ____ to its own contractions.
 A respect
 B direction
 C response
 D difference
- 21 Also important is movement of ____ structures such as the diaphragm and lungs.
 A dilated
 B adjacent
 C difficult
 D actual
- 22 What is the outer wall of the human heart ____ of?
 A correlated
 B composed
 C compromised
 D contained
- 23 The human heart also has two superior ____ and two inferior ventricles.
 A atrium
 B atria
 C tendons
 D traces
- 24 What is the ____ of the ventricles?
 A role
 B room
 C ratio
 D retention
- 25 What do you know about the ____ of blood through the human heart?
 A patches
 B pathways
 C position
 D presence
- 26 It is part of the pulmonary and systemic ____ .
 A circuits
 B circles
 C ciphers
 D cystitis
- 27 The mitral and tricuspid valves are ____ as the atrioventricular (AV) valves.
 A clasped
 B clogged
 C classified
 D clapped
- 28 A thick wall of muscle ____ the left atrium and ventricle from the right atrium and ventricle.
 A stands
 B submits
 C surveys
 D separates
- 29 It divides the heart into two functionally separate and anatomically ____ units.
 A disintegrated
 B devised
 C distant
 D distinct
- 30 Physicians commonly refer to the right atrium and right ventricle together as the right ____ .
 A heart
 B heel
 C hand
 D hose

Test 43

PEPTIC ULCERATION

- 1 In which parts of the alimentary canal do peptic ulcerations ____ ?
A inhabit
B enable
C invite
D occur
- 2 They can be found solely in the parts which are ____ to the action of hydrochloric acid.
A expressed
B exposed
C resorted
D operated
- 3 To what segment are they usually ____ ?
A concerned
B competitive
C cleaned
D confined
- 4 They may also be ____ in some unusual situations.
A finding
B found
C acid
D arrangement
- 5 The word is of some abnormal situations to which the acid has gained ____ .
A arrangement
B apart
C access
D acquisition
- 6 The presence of hydrochloric acid in the stomach is a ____ of ulceration.
A requisite
B disturbance
C prerequisite
D demonstration
- 7 However, the presence of the acid is not the ____ of ulceration.
A care
B case
C cast
D cause
- 8 The duodenal type of ulcer is diagnosed more ____ in males.
A oftener
B rare
C often
D robust
- 9 They are usually intellectual, ambitious, and of a worrying ____ .
A respect
B knowledge
C name
D nature
- 10 Anxiety and ____ smoking seem to be the chief causes of ulcer onset and relapse.
A experimental
B exercised
C excessive
D extinguished
- 11 Secondary factors are ____ to cold, irregular meals and overwork.
A exercise
B export
C exposure
D extreme
- 12 Duodenal ulcer is ____ with a high and small stomach set transversely.
A affected
B assumed
C assessed
D associated
- 13 It is also characterised by a steep ____ of acid production.
A treatment
B tool
C connection
D curve
- 14 When does a duodenal ulcer ____ well to treatment?
A develop
B respond
C reflect
D determine

- 15 Hyperchlorhydria is ____ followed by ulceration.
 A sole
 B seldom
 C random
 D solely
- 16 This is exactly why some other explanation must be ____ .
 A thought
 B sought
 C taught
 D installed
- 17 In their clinical ____ duodenal and gastric ulcers are different.
 A characters
 B addresses
 C education
 D preparedness
- 18 They are as different ____ are measles and mumps.
 A as
 B that
 C than
 D which
- 19 Duodenal ulcer is becoming more ____ .
 A frequent
 B favourable
 C founded
 D fashionable
- 20 Which ____ in the aetiology of duodenal ulcer appears in every clinical analysis?
 A frame
 B form
 C fraction
 D factor
- 21 A perfectly happy man never ____ from duodenal ulcer!
 A differs
 B collects
 C prohibits
 D suffers
- 22 He never has a duodenal ulcer however unsuitable his ____ may be.
 A diabetes
 B diet
 C diarrhea
 D density
- 23 The cause of the patient's ____ should be removed, and smoking abandoned.
 A afterwards
 B abandonment
 C aspiration
 D anxiety
- 24 It remains healed as long as the ____ factors do not recur.
 A causative
 B pretending
 C hospital
 D medicine
- 25 There are no such clearly linked ____ causes of gastric ulcer.
 A priority
 B primary
 C pretentious
 D preference
- 26 However, in some patients oral sepsis and malnutrition seem to be partly ____ .
 A refused
 B responsible
 C regenerated
 D restricted
- 27 Gastric ulcer occurs with much the same frequency in both ____ .
 A sexes
 B members
 C notions
 D assistants
- 28 It is commonly seen in persons who are in ____ general health.
 A poor
 B rich
 C primary
 D potential
- 29 At a later ____ , gastric ulcers tend to become refractory.
 A stage
 B type
 C acid
 D frequency
- 30 Duodenal ulcers ____ a better chance of cure than gastric ulcers.
 A obtain
 B offer
 C occupy
 D organize

Test 44

A PERIOD OF IMPROVED CLEANLINESS

- 1 The Black Death first visited Europe from some ___ fountain-source in the East.
A mountain
B mysterious
C metropolitan
D medicinal
- 2 It swept off a third, possibly a half, of the ___ of Boccaccio and Chaucer.
A patriots
B compatriots
C poisons
D penalties
- 3 The most terrible ___ of its first advent was its ubiquity.
A feat
B feature
C feast
D fast
- 4 Some villages and ___ ceased to exist.
A hamlets
B hams
C hamsters
D helmets
- 5 In the winter of 1349 the plague was ____ .
A stayed
B stood
C stand
D situated
- 6 Yes, it was, but it still remained in the ____ .
A island
B aisle
C ice
D ace
- 7 It was perpetually breaking out in one ___ township after another.
A insane
B insanitary
C insufficient
D inspired
- 8 It was partly due to earlier marriages and an ___ in the crude birthrate.
A increase
B appease
C invention
D option
- 9 It was rather due to the saving of life by ___ in medical science and practice.
A instruments
B aspirations
C improvements
D ambitions
- 10 Also recorded was a positive change in the ___ of living.
A sampling
B separation
C selection
D standard
- 11 It may to some extent be ___ to cheap goods produced by the new mechanical inventions
A attributed
B attained
C accepted
D astonished
- 12 The plague was so long ___ in England!
A entrusted
B endoscopic
C endemic
D experimental
- 13 Then the control was established of the ravages of scurvy and ___ of small-pox.
A unemployment
B unprecedented
C ultimatum
D ultimately
- 14 The reduction was achieved of ague and ____ .
A fever
B feverish
C furnishings
D fountain

- 15 Its last ___ is known as Charles II's 'Plague of London'.
 A atmosphere
 B intensity
 C appearance
 D irritation
- 16 It seems to have been little ___ than the plagues of earlier times.
 A wearing
 B wisdom
 C winding
 D worse
- 17 Yes, several plagues had ___ the capital in Tudor and Stuart times.
 A deprived
 B devastated
 C demonstrated
 D deleted
- 18 Plague was like a ___ cloud, you know!
 A busy
 B burnt
 C black
 D boney
- 19 That cloud was ___ over the filthy streets.
 A searching
 B combing
 C heat
 D hovering
- 20 Yes, it was like a cloud over the filthy streets and ___ lives of the people of the times.
 A grief
 B brief
 C briefing
 D grafted
- 21 It was a frequent sequel to the ___ of a bad harvest year.
 A fame
 B frame
 C famine
 D friends
- 22 From 1760 onwards, there was the unexampled ___ in population.
 A rice
 B robust
 C rose
 D rise
- 23 That reduction was achieved by the ___ of the land.
 A drawing
 B drafting
 C draining
 D density
- 24 There was the advance of the ___ of cleanliness and the use of cheap cotton shirts.
 A habitats
 B haemorrhage
 C haemolysis
 D habits
- 25 As compared to the past, there were significant improvements in ___ in London.
 A sanitation
 B sanitary
 C ambulance
 D perambulator
- 26 However, the ___ of Howard appears appalling to our nice senses to-day.
 A adhesion
 B advantage
 C age
 D understatement
- 27 There were more and better hospitals and better medical care of mothers and ____ .
 A infidels
 B instruments
 C improvements
 D infants
- 28 This greatly reduced ___ at child-birth or by various infantile diseases.
 A mortars
 B mortality
 C misery
 D misers
- 29 At the end of George III's ___ the French death-rate was higher than the English.
 A raid
 B rise
 C reign
 D reformation
- 30 The later XVIII century in England was a period of improved science, cleanliness, and ____ .
 A humidifiers
 B humidity
 C humanitarian
 D humanity

Test 45

REACTIONS TO BEING INFORMED ABOUT HPV

- 1 What can you tell us about the ___ understanding about HPV?
A public
B demonstrative
C arrangement
D publicity
- 2 Yes, it has lagged behind the scientific and technical ____ .
A generations
B acceptance
C gestation
D advances
- 3 HPV testing has significant social and psychological ____ .
A construction
B consecutive
C consequences
D complication
- 4 This is exactly why there is an ___ need for health education.
A urgent
B ultimatum
C ultra
D ultimately
- 5 What happens when women are tested ___ HPV?
A to
B at
C with
D for
- 6 When they are tested, women ___ that they want information and guidance.
A devise
B express
C determine
D export
- 7 They want information both from their health care ___ and through open sources.
A providers
B provisions
C basics
D surgeons
- 8 Such studies have explored reactions to ___ information about HPV.
A receiving
B receive
C report
D resemble
- 9 To be explained is the name of the virus, as well as the ___ of its transmission.
A modern
B mode
C moment
D motivation
- 10 To be understood is also the prevalence of ___ infection.
A transversal
B tiring
C transient
D traditional
- 11 It is true that most women are ___ by the information.
A astonished
B inherited
C implied
D intensified
- 12 Many are simply ___ that they did not know about it before.
A attached
B shocked
C attacked
D attracted
- 13 All the qualitative studies in the ___ find that women want more information about HPV.
A resort
B ground
C field
D soil
- 14 They do not want the answers to their questions to be confusing and ____ .
A inconsistent
B illiterate
C irregular
D intermediate

- 15 HPV information ___ complex, and many women remain confused.
 A is
 B has
 C are
 D being
- 16 Yes, many of them remain confused after having read ___ materials.
 A membership
 B voluntary
 C educational
 D involuntary
- 17 People at all levels of health ___ simply have to be informed about HPV.
 A literature
 B lining
 C literacy
 D lymph
- 18 ___ such information to all people will really be important.
 A Insurance
 B Insuring
 C Ensuring
 D Employing
- 19 This should address many of the psychological ___ posed by HPV testing.
 A issues
 B implants
 C experiments
 D experts
- 20 This should also help ensure that women ___ from the scientific advances.
 A exploit
 B benefit
 C extend
 D benefits
- 21 Such advances are expected to ___ contribute to world-wide control of cervical cancer.
 A unimportantly
 B ultimately
 C unconsciously
 D untouchably
- 22 What do we know about qualitative studies with women from a ___ of backgrounds?
 A radius
 B radiant
 C rangers
 D range
- 23 Health professionals' knowledge of HPV has not received ___ attention.
 A measured
 B much
 C motionless
 D many
- 24 What does the experience of women with ___ test results suggest?
 A pardoned
 B positive
 C partial
 D potential
- 25 Their experience suggests that many have ___ knowledge about HPV.
 A literary
 B limited
 C liquidated
 D leasure
- 26 Education of health professionals should be a ___ .
 A posterity
 B priority
 C potential
 D protection
- 27 Women's reactions to hearing about the test include confusion and ___ .
 A anxiety
 B anxious
 C society
 D solvents
- 28 Also important become the topics of ___ and trust in relationships.
 A doing
 B fidelity
 C prospects
 D cycles
- 29 The abbreviation *STIs* stands for ___ *transmissible infections*.
 A *sexually*
 B *statistically*
 C *spontaneously*
 D *surgically*
- 30 Most women outside of stable relationships express the wish to know their HPV ___ .
 A status
 B standard
 C stability
 D system

Test 46

A REQUIRED ACTIVITY, NOT AN OPTION

- 1 Sleep is a behavioral ____ that is a natural part of every individual's life.
A state
B status
C system
D standing
- 2 We spend about one-third of our lives ____ .
A sleep
B asleep
C a sleep
D slope
- 3 Nonetheless, people generally know little about the importance of this ____ activity.
A escort
B estimated
C essential
D essence
- 4 Sleep is not just something to fill time when a person is ____ .
A inactive
B hyperactive
C active
D activated
- 5 To put it ____ , sleep is a required activity, not an option.
A slowly
B simply
C certainly
D closely
- 6 However, the precise ____ of sleep remain a mystery.
A forceps
B functions
C fantasies
D fractures
- 7 Sleep is important for normal ____ and cognitive function.
A membership
B motor
C mounted
D motorists
- 8 Problem sleepiness may also be associated with memory ____ , loss of energy, fatigue, ...
A channels
B labs
C spas
D lapses
- 9 The prevalence of problem sleepiness is high and has ____ consequences.
A serious
B portable
C middle
D environmental
- 10 Some of the consequences can be ____ driving or workplace accidents.
A drawing
B divided
C drowsy
D dreaming
- 11 Lifestyle factors can ____ problem sleepiness.
A cause
B inspire
C protect
D advise
- 12 The same is true of ____ or untreated sleep disorders.
A unprecedented
B momentary
C undiagnosed
D unobtained
- 13 Lifestyle factors include having an irregular sleep ____ in the first place.
A schedule
B source
C exclusivity
D exposure
- 14 To be mentioned is also using alcohol or certain ____ .
A medications
B precautions
C suppositions
D meditations

- 15 We all recognize and ___ the need to sleep.
 A feel
 B felt
 C forgive
 D forget
- 16 After ____, we recognize changes that have occurred.
 A sleepless
 B sleeping
 C suspicion
 D slept
- 17 This means that we are rested and more ____ .
 A advanced
 B acquired
 C alert
 D acquainted
- 18 Sleep actually appears to be required for ____ .
 A survival
 B surprise
 C revival
 D sequence
- 19 Rats deprived ____ sleep will die within two to three weeks.
 A to
 B of
 C some
 D from
- 20 This is a time frame similar to death due to ____ .
 A suspension
 B penetration
 C preservation
 D starvation
- 21 Is it normal for a person to be ___ when they expect to be awake?
 A sleepy
 B slowly
 C daily
 D dairy
- 22 Problem sleepiness may be ___ with difficulty concentrating.
 A associated
 B dissected
 C disconnected
 D arrested
- 23 Have you heard already that there are more than 70 ___ sleep disorders?!
 A knowing
 B known
 C knowingly
 D knowledge
- 24 The most common among them include ___ sleep apnea, insomnia, narcolepsy, ...
 A opportunity
 B obvious
 C obstructive
 D obstetrician
- 25 Unfortunately, problem sleepiness can be ___ !
 A disturbed
 B deadly
 C defined
 D dentistry
- 26 Many car ___ each year result from drivers who were "asleep at the wheel".
 A crashes
 B cases
 C casts
 D containers
- 27 Such accidents are ___ common among young male drivers.
 A especially
 B specially
 C incidentally
 D effortlessly
- 28 Problem sleepiness can also cause difficulties with learning, ____, thinking, ...
 A members
 B memory
 C membership
 D myelin
- 29 These problems may ___ to poor school and work performance.
 A lease
 B lead
 C leave
 D live
- 30 Difficulties with ___ are also among the consequences.
 A relativity
 B relations
 C relationships
 D relatives

Test 47

RUNNING IN THE FAMILY

- 1 Did you know that suicidal behaviour is ___ within families?
A transformed
B transmitted
C operated
D injected
- 2 There is substantial evidence that this ___ true.
A gets
B receives
C goes
D holds
- 3 This association is found ___ a range of psychiatric disorders.
A away
B after
C across
D about
- 4 What about the ___ transmission of the disorders themselves?
A familial
B familiar
C family
D families
- 5 It is related, at ___ in part, to genetic factors.
A least
B last
C latest
D later
- 6 Evidence to that has received support from ___ studies.
A too
B twitter
C twilight
D twin
- 7 What about the concordance for suicidal behaviour between ___ pairs?
A multiple
B very
C such
D whole
- 8 What do post-mortem cerebrospinal ___ and twin studies suggest?
A flow
B charts
C fluid
D forceps
- 9 They speak about the most ___ biological foundation of suicidal behaviour.
A lovely
B likely
C lonely
D relatively
- 10 They stress reduced activity within the serotonin ___ systems.
A trial
B trading
C traditional
D transporter
- 11 This system is thought to be important in the control of both ___ and impulsivity.
A impulse
B aggression
C implementation
D arrangement
- 12 What is perhaps of ___ there?
A relevance
B performance
C relativity
D mediation
- 13 Family history of aggressive behaviour is ___ in children who engage in suicidal behaviour.
A correct
B like
C common
D good
- 14 What do we ___ about both adolescent suicides and suicide attempters?
A knew
B guess
C know
D generally

- 15 Can you explain the ___ between monozygotic and dizygotic twins?
 A difference
 B destiny
 C density
 D disturbance
- 16 What did a Danish non-twin ___ study examine?
 A arrangement
 B symptom
 C membership
 D adoption
- 17 What about the ___ predisposition for suicidal behaviour?
 A going
 B generalized
 C genial
 D genetic
- 18 What about the predisposition for ___ psychiatric disorders?
 A matter
 B major
 C mayor
 D master
- 19 There was also a further investigation of adoptees with a history of ___ disorder.
 A shared
 B consecutive
 C affective
 D effective
- 20 Are all such disorders associated with a situational ___ ?
 A crises
 B exploitation
 C crisis
 D statement
- 21 Suicidal behaviour in these circumstances is often ____ .
 A disinfected
 B impulsive
 C difference
 D deteriorated
- 22 The predisposition may be related to an ___ to control responses.
 A inability
 B imperfection
 C instability
 D importance
- 23 ___ with a history of aggression are more likely to have a family history of suicidal behaviour.
 A That
 B Trials
 C Those
 D Traditionalists
- 24 Studied were also those who have already ___ out an act of suicidal behaviour.
 A certified
 B carried
 C cried
 D complicated
- 25 Little ___ has been paid to the implications of a family history there.
 A atmosphere
 B attention
 C aspiration
 D annoyance
- 26 Such information may have relevance to ___ the aetiology of suicidal behaviour.
 A operating
 B understanding
 C underlining
 D protecting
- 27 It may also have relevance to ___ of such behaviour.
 A tradition
 B meditation
 C treatment
 D surgery
- 28 Are there differences between those with and those without a ___ family history?
 A productive
 B making
 C positive
 D coordinated
- 29 The word is of the family history ___ terms of the nature of their DSH.
 A against
 B for
 C from
 D in
- 30 The abbreviation DSH stands ___ *deliberate self-harm*.
 A in
 B with
 C for
 D where

Test 48

THE SHOCK SHOP

- 1 Pity you haven't had the ___ of being in there yet!
A pleasure
B predominance
C prevalence
D particle
- 2 This is an experience no human should be ___ !
A without
B where
C warranty
D wounded
- 3 At that moment Harding ___ his fingers behind his neck.
A looked
B loaded
C likened
D laced
- 4 After that he ___ back to look at the door.
A loved
B lived
C lost
D leaned
- 5 That's the *Shock Shop* I was telling you some time ___, my friend!
A front
B back
C lack
D down
- 6 The acronym EST stands here for Electro-Shock ____ .
A Teaching
B Therapy
C Trade
D Thinking
- 7 Those ___ souls in there are being given a free trip to the moon!
A freedom
B fortune
C fortunate
D fortified
- 8 Everything ___ here is for the patient's good!
A chose
B choice
C could
D done
- 9 EST is not always used for ___ measures, as our nurse uses it.
A prolonged
B pardoned
C potential
D punitive
- 10 Of course, it is not pure sadism on the staff's ___, either.
A circle
B route
C part
D way
- 11 A number of supposed irrecoverables were brought back into ___ with shock.
A cease
B care
C contact
D collect
- 12 Shock treatment has some advantages: it is cheap, quick, ___ painless.
A entirely
B many
C entire
D thorough
- 13 Give some of us ___ to stop a fit, give the rest a shock to start one!
A pills
B pillows
C parts
D plays
- 14 Harding continued, ___ to explain it to McMurphy.
A improving
B trying
C stitching
D soaking

- 15 Oh, no, no, on second ____ , it isn't completely free.
 A fought
 B bought
 C thought
 D chance
- 16 You pay for the service with ____ cells instead of money!
 A brown
 B betrayed
 C brain
 D believe
- 17 Everyone has ____ billions of such cells on deposit!
 A simple
 B sympathetic
 C simply
 D seven
- 18 He frowned at the one ____ man left on the bench.
 A lone
 B love
 C live
 D like
- 19 Not a very large ____ today, it seems, nothing like the crowds of yesteryear.
 A clientele
 B clone
 C customer
 D client
- 20 Our dear head nurse is one of the few with the heart to stand up for that ____ old tradition!
 A given
 B glow
 C growing
 D grand
- 21 They tab some bird in there and shoot ____ through his skull?!
 A electrons
 B lightning
 C voltage
 D electricity
- 22 That's for the patient's ____ , of course!
 A well
 B great
 C sane
 D good
- 23 Listen carefully! Here's how it ____ about...
 A go
 B came
 C has
 D can
- 24 What was known about men coming out of an epileptic ____ ?
 A conclusion
 B competition
 C convulsion
 D connection
- 25 It was known that they were inclined to be calmer and more ____ for a time.
 A poisoned
 B quarrelsome
 C peaceful
 D belligerent
- 26 What about the so-called ____ cases completely out of contact?
 A violent
 B blamed
 C histology
 D wait
- 27 They were able to carry on ____ conversations after the EST.
 A refrain
 B reversible
 C ration
 D rational
- 28 If a seizure could be induced in non-epileptics, great ____ might result.
 A donations
 B benefits
 C preparation
 D attention
- 29 It is completely painless, I ____ guarantee it!
 A personally
 B pretend
 C allow
 D fearing
- 30 One ____ and you're unconscious immediately!
 A flesh
 B institute
 C attempting
 D flash

Test 49

SLEEP IS A DYNAMIC PROCESS

- 1 Scientists study sleep by ____ electrical changes in the brain.
A making
B measuring
C arranging
D taking
- 2 Typically, electrodes are placed on the scalp in a symmetrical ____ .
A pattern
B place
C position
D arranged
- 3 They measure very small ____ .
A wear
B works
C voltages
D vaults
- 4 Scientists think they are ____ by synchronized activity in synapses.
A caused
B ceased
C common
D cared
- 5 The word is of nerve ____ in the cerebral cortex.
A connections
B portion
C port
D definition
- 6 The *cerebral cortex* is the name of the the brain's outer ____ .
A dense
B lenses
C layers
D stations
- 7 EEG data are represented by ____ that are classified according to their frequencies.
A dots
B plays
C curves
D certificates
- 8 They are recorded on ____ moving chart paper.
A chance
B completely
C constant
D continuously
- 9 They can be digitized by a computer and ____ on a high-resolution monitor.
A distinguished
B displayed
C disintegrated
D deleted
- 10 This allows the ____ among the three measurements to be seen immediately.
A relatives
B relations
C references
D relationships
- 11 What do the ____ of activity in these three systems provide?
A positions
B poles
C patterns
D parts
- 12 They provide the basis for ____ the different types of sleep.
A collecting
B classifying
C maintaining
D minimizing
- 13 Studying these events has ____ to the identification of two basic stages.
A left
B led
C lead
D loaded
- 14 These two stages, or ____ , of sleep are NREM and REM.
A seasons
B projections
C states
D inclusions

- 15 The ___ lines of the EEG are called brain waves.
 A wavy
 B weary
 C warm
 D warning
- 16 An electrooculogram (EOG) uses ___ on the skin near the eye.
 A electrodes
 B additions
 C numbers
 D adhesives
- 17 They measure changes in voltage as the eye rotates in its ____ .
 A sock
 B socket
 C plug
 D box
- 18 Scientists also measure the electrical activity associated with the ___ muscles.
 A active
 B action
 C examination
 D extraction
- 19 This is done by ___ electromyograms (EMGs).
 A using
 B having
 C measuring
 D recording
- 20 In this technique, in humans the electrodes are placed under the ____ .
 A pin
 B tongue
 C chin
 D teeth
- 21 Muscles in this area ___ very dramatic changes during the various stages of sleep.
 A dissect
 B demonstrate
 C distract
 D distribute
- 22 In ____, EEGs, EOGs, and EMGs are recorded simultaneously.
 A tradition
 B practice
 C expression
 D ambulance
- 23 The EEG, EMG, and EOG pictures change in ___ ways.
 A inhibited
 B inspired
 C proportionate
 D predictable
- 24 They change several times during a single ___ period.
 A slipping
 B sleepy
 C sleepless
 D sleep
- 25 NREM sleep is ___ into four stages.
 A done
 B dreamed
 C divided
 D distributed
- 26 It is done according to the ___ and frequency of brain wave activity.
 A amplitude
 B atmosphere
 C principle
 D proportion
- 27 In general, the EEG pattern of NREM sleep is ___ than that of wakefulness.
 A darker
 B lighter
 C slower
 D harder
- 28 REM sleep is characterized by ___ of rapid eye movement.
 A doing
 B positions
 C products
 D bursts
- 29 The eyes stop for a while and then ___ back and forth again.
 A jerk
 B hop
 C jump
 D leap
- 30 Scientists believe that the eye movements of REM sleep relate to the visual ___ of dreams.
 A improvements
 B images
 C impressions
 D implementations

Test 50

SLOWLY PROGRESSIVE VISUAL AGNOSIA

- 1 Visual agnosia is characterized by difficulty in ____ visually presented objects.
A recognising
B revealing
C receiving
D revising
- 2 This, of course, in the absence of ____ of primary visual and intellectual functions.
A implementation
B impairment
C essence
D effort
- 3 Some scientists propose the ____ between apperceptive agnosia and associative agnosia.
A disbalance
B difficulty
C distinction
D dialysis
- 4 Apperceptive agnosia is related to the perceptual analysis of the ____ .
A status
B completion
C stimulus
D compounds
- 5 Associative agnosia is related to the ____ between the conscious percept and its meaning.
A association
B appreciation
C arrangement
D abandonment
- 6 Patients with apperceptive agnosia cannot ____ a design or match an object/figure to a sample.
A catch
B copy
C crude
D consult
- 7 Those with associative agnosia cannot recognise or ____ an object.
A need
B nest
C name
D nourish
- 8 Progressive visual agnosia is a particular condition that ____ slowly.
A wears
B writes
C works
D worsens
- 9 It progresses with the addition of different visually-mediated ____ .
A densities
B deficits
C reports
D prescriptions
- 10 These are added progressively to a Balint-Holmes ____ or global dementia.
A syrup
B syringe
C system
D syndrome
- 11 This picture ____ other chronic cognitive deficits.
A resembles
B reacts
C reports
D restores
- 12 They are all characterised by ____ worsening and focal cortical atrophy.
A managed
B chronic
C contemporary
D middle
- 13 Slowly progressive visual agnosia is associated with ____ cortical atrophy.
A posterity
B unstable
C posterior
D improved
- 14 This ____ with the gross brain damage reported in other cases of visual agnosia.
A contrasts
B proposes
C penetrates
D controls

- 15 However, they can remember it from verbal description, and ___ its use.
 A mimicry
 B mime
 C mind
 D miss
- 16 Different ___ of these two types of visual agnosia have been described.
 A cases
 B casts
 C members
 D monitors
- 17 In a few examples visual agnosia has been ___ in a picture of multisensorial agnosia.
 A imprisoned
 B imposed
 C included
 D imprinted
- 18 Most cases of visual agnosia ___ acute lesions in the occipital areas.
 A follow
 B exert
 C forge
 D expand
- 19 The word is of acute vascular, ___, or tumour lesions in the occipital areas.
 A trauma
 B tender
 C traumatic
 D triangular
- 20 Many cases also appear after herpes encephalitis, or carbon monoxide ____ .
 A exercises
 B preparations
 C treatments
 D poisoning
- 21 In these conditions, bilateral damage of the occipital and posterior ___ areas is present.
 A trauma
 B tiredness
 C temptation
 D temporal
- 22 Associative agnosia has been related to left posterior ___ damage.
 A central
 B cortical
 C crude
 D causal
- 23 On these grounds, a serious question has been ____ .
 A risen
 B raised
 C raided
 D reasoned
- 24 What would the results of neuropsychological assessment and neuroimaging ____ ?
 A insist
 B indicate
 C instal
 D impress
- 25 Would they ___ the neuroanatomical correlates of primary visual agnosia?
 A petrify
 B clarify
 C pretend
 D signify
- 26 What was ___ to describe a case of slowly progressive visual agnosia?
 A utility
 B frequented
 C used
 D proliferated
- 27 Longitudinal ___ and neuropsychological assessment was made.
 A creativity
 B mortality
 C myopathy
 D clinical
- 28 It was ___ with magnetic resonance imaging (MRI).
 A counted
 B collided
 C combined
 D crushed
- 29 It was also assisted by spectroscopy and positron ___ tomography (PET).
 A interpretation
 B atmosphere
 C ambition
 D emission
- 30 What about the relation of visual agnosia with ___ cortical metabolism?
 A deprived
 B destructive
 C decreased
 D deserted

Test 51

SMOKING WORSENS THE PROGNOSIS

- 1 Multiple sclerosis (MS) is ___ as a chronic autoimmune disorder.
A reflected
B regarded
C protected
D admitted
- 2 This is a disorder that selectively ___ the central nervous system.
A affects
B respects
C connects
D subtracts
- 3 What does typically happen in the early ___ of the MS disease?
A phrase
B strength
C selection
D phase
- 4 New symptoms appear and ___ in the relapsing remitting MS – RRMS.
A resolve
B concern
C present
D maintain
- 5 After that, a continuous deterioration ___ (secondary perogressive MS – SPMS).
A occurs
B adheres
C implodes
D defines
- 6 It is assumed that the two correspond to an ___ process and neurodegeneration, respectively.
A interrogatory
B downwards
C inflammatory
D affectionate
- 7 The primary-progressive (PPMS) clinical ___ is present with about 10% of persons with MS.
A surrounding
B subtype
C surrogate
D submarine
- 8 Yes, smoking increases the ___ for acquiring several diseases.
A reason
B rapport
C rodent
D risk
- 9 It is also associated with worsening of the prognosis of ___ cancer.
A litter
B literal
C lung
D literary
- 10 What do we know about the effect from smoking ___ MS?
A in
B at
C to
D of
- 11 We know that an increased risk for ___ from RRMS to SPMS has been shown.
A conversion
B clearance
C connection
D complaint
- 12 What about the effect of smoking started at an early ___ ?
A arrangement
B age
C aspiration
D appliance
- 13 Yes, ___ smoking is associated with a worsened MS prognosis!
A secretive
B past
C secret
D post
- 14 Ever smokers develop progressive disease earlier after MS ____ .
A onset
B improvement
C outlet
D hamlet

- 15 The PPMS is characterised by a continuous progression in the ___ of relapses.
 A apparatus
 B intent
 C absence
 D sphere
- 16 Except for the PPMS, there is a 2:1 female surplus in MS ____ .
 A addiction
 B incidence
 C membership
 D infection
- 17 The prognosis in MS ____ between individuals, of course.
 A vanishes
 B varnishes
 C varies
 D variables
- 18 The prognosis, however, depends mostly on how early the progressive MS ____ occurs.
 A experiment
 B course
 C creativity
 D contexts
- 19 Cigarette smoking is associated with a huge number of ___ health effects.
 A adversary
 B arranged
 C adverse
 D astonished
- 20 Cardiopulmonary disease, ___ and cancer are only some of such effects.
 A intestines
 B implants
 C extremities
 D infections
- 21 Smoking is associated with an increased risk ___ autoimmune diseases.
 A from
 B with
 C against
 D for
- 22 ___ lupus erythematosus and autoimmune thyroid disease are among such.
 A Certain
 B Suspicious
 C Systemic
 D Cardinal
- 23 This suggests that toxic effects from smoking ___ neurodegeneration in MS.
 A decide
 B promote
 C invent
 D pretend
- 24 Of course, there is a higher ___ of smokers among men.
 A proposition
 B priority
 C prevalence
 D preposition
- 25 The ___ difference in MS incidence (a 2:1 female surplus) is lacking for PPMS.
 A great
 B general
 C gender
 D generous
- 26 In case of PPMS, the incidence is ___ for men and women.
 A strong
 B similar
 C sure
 D simple
- 27 What is ___ smoking in adolescence associated with?
 A striving
 B staying
 C starting
 D standing
- 28 It is associated with an increased ___ for maternal smoking during pregnancy.
 A advance
 B adulthood
 C love
 D likelihood
- 29 However, it may also in itself affect future ___ function.
 A improper
 B impersonal
 C immune
 D immunology
- 30 Do you now understand and ___ that smoking worsens the prognosis in MS?
 A connect
 B inspire
 C agree
 D degree

Test 52

THAT'S WHY YOUR SINUSES ARE BUNGED UP!

- 1 *Sinusitis* is the medical ____ for inflammation in the sinuses.
A termination
B form
C term
D formation
- 2 The sinuses are the small, air-filled cavities inside the ____ .
A skin
B skull
C bone
D groin
- 3 Each sinus is ____ with the same sensitive tissue.
A liked
B likened
C looked
D lined
- 4 That sensitive tissue covers the ____ of the nose.
A implication
B implement
C inside
D internal
- 5 This moist tissue releases a constant ____ of mucus.
A supply
B imply
C support
D import
- 6 The mucus feeds down into the nose to keep the nasal passages ____ .
A most
B must
C modest
D moist
- 7 Dust, allergens and pollutants are ____ there before they can penetrate the lungs.
A traded
B trapped
C tried
D translated
- 8 The virus ____ the sensitive tissues, which then become inflamed.
A interrupts
B irritates
C shapes
D streams
- 9 This blocks the drainage hole, the ostium, so mucus cannot ____ down into the nose.
A drain
B draw
C draft
D disable
- 10 The wrong ____ of bugs in the mucus can cause an infection, of course.
A mixture
B mission
C maintenance
D medium
- 11 Symptoms include a fever, throbbing pain, tiredness, bad ____, ...
A breadth
B breathe
C breeze
D breath
- 12 Did you know that a ____ allergy is a common cause of sinus problems!
A performance
B perforation
C perfume
D pearl
- 13 It can also cause symptoms ____ from skin rashes to nausea and dizziness.
A rating
B treating
C ranging
D tearing
- 14 Acute sinusitis can lead to the ____ of polyps in the nostrils.
A frustration
B process
C formation
D procedure

- 15 Constant changes in atmosphere are putting this ___ system under pressure.
 A divided
 B delicate
 C delicious
 D downward
- 16 The human nose ___ millions of years ago.
 A extinguished
 B eraded
 C eroded
 D evolved
- 17 This was when changes in temperature happened gradually with the ____ .
 A supports
 B systems
 C seasons
 D surgery
- 18 This really meant the human nose had time to ____ .
 A adopt
 B except
 C adapt
 D effort
- 19 What happens now, with ___ heating and air conditioning?
 A close
 B cloud
 C central
 D shallow
- 20 Now we are constantly exposing the nose and the sinuses to ___ in temperature.
 A circumference
 B experiments
 C destruction
 D swings
- 21 Changes in humidity also affect the way the lining of the ___ passages works.
 A nostril
 B neon
 C neocortex
 D nasal
- 22 Most sinus infections start with a ____ .
 A cooling
 B cold
 C cool
 D contest
- 23 Polyps are tiny grape-like ___ in the nostrils and inside the sinuses.
 A growing
 B growths
 C grates
 D ingredients
- 24 They can ___ the sinuses and help create the right conditions for a bacterial infection.
 A bleach
 B block
 C blow
 D blunt
- 25 The problem with central heating and air conditioning is – the drier ___ conditions.
 A indoor
 B inside
 C internal
 D immediate
- 26 Chlorine used to disinfect swimming ___ can also cause sinus problems.
 A pools
 B trunks
 C suits
 D costumes
- 27 When a tooth in the upper jaw becomes infected, the sinus ___ can again be affected.
 A underneath
 B above
 C below
 D down there
- 28 The bacteria can literally burrow ___ the bone structure.
 A thorough
 B thought
 C through
 D though
- 29 Grass or birch tree pollen are major ___ for hay-fever sinusitis.
 A triggers
 B tigers
 C fighters
 D forms
- 30 Tiny fragments of pollen penetrate the ___ and irritate the mucus membranes.
 A sideways
 B ways
 C stairways
 D airways

Test 53

SOME OF THE INCIDENTS HE REMEMBERED...

- 1 There was no continuity in his recollection of his ____ .
A internship
B intensity
C density
D demonstration
- 2 He could never recall which ____ he had been on.
A words
B wards
C warns
D woods
- 3 His only ____ was that of scattered episodes.
A warden
B momentary
C memory
D ward
- 4 There was no relationship to the time when the events ____ .
A arrested
B occurred
C obtained
D certified
- 5 There was the patient who ____ of cardiac arrest during an elective hernia repair.
A continued
B expected
C expired
D astonished
- 6 The surgeon cut into the ____ and massaged the heart with his hand.
A quest
B test
C thirst
D chest
- 7 They kept the patient ____ artificially for hours.
A doing
B going
C staying
D pending
- 8 And he also remembered that man who had been ____ through the head.
A slot
B chosen
C chanced
D shot
- 9 There was a small ____ of brain matter in his hat!
A article
B aspect
C collection
D corps
- 10 The ____ walked in and an hour later walked out!
A patent
B patient
C paste
D patience
- 11 He showed no ____ effects from the hole in his head!
A aloud
B inhibited
C apparent
D inverted
- 12 And there was the ____ when he saw a surgeon cut the cystic artery.
A throne
B time
C trace
D tide
- 13 That terrible thing happened during a gall-____ operation.
A bladder
B blade
C trade
D tone
- 14 The surgeon thought the artery had been ____ .
A stoned
B stapled
C clamped
D clipped

- 15 There was the woman who walked into the Accident Room with a ___ eyeball.
 A secluded
 B sentenced
 C ruptured
 D rusty
- 16 She had been ___ in the eye by the point of a high-heeled slipper.
 A appreciated
 B tricked
 C stuck
 D struck
- 17 There was the baby who had ___ out of a three-story window.
 A fallen
 B fatten
 C molten
 D proven
- 18 The baby had landed on a ___ pavement on its head!
 A complete
 B concrete
 C casual
 D correct
- 19 However, the baby showed nothing whatever as a ___ !
 A creation
 B contents
 C consequence
 D conscious
- 20 And there was the wino who had been run ___ by a freight train!
 A on
 B over
 C under
 D away
- 21 The top half of him was fully conscious, in no pain, ___ and happy as ever.
 A truck
 B trunk
 C drunk
 D drink
- 22 And that top half of him lived on for a ___ of many hours.
 A master
 B more
 C manner
 D matter
- 23 And Crest, of course, knew it hadn't been ____ .
 A invent
 B secured
 C surprise
 D clamp
- 24 It is true that he tried to ___ the surgeon.
 A warn
 B worm
 C waste
 D wish
- 25 The surgeon cursed ___ him, and cut the artery.
 A at
 B on
 C in
 D to
- 26 The ___ was the approximate size and shape of a can containing tennis balls.
 A wind
 B wound
 C winding
 D way
- 27 The surgeon lost his head ___ and started grabbing around blindly.
 A cardinally
 B creatively
 C completely
 D calmly
- 28 He had to ___ the surgeon from the table forcefully.
 A protect
 B pull
 C produce
 D push
- 29 He compressed the aorta against the backbone with one ____ .
 A fist
 B foot
 C front
 D fault
- 30 He sucked out the blood with a ___ tip held in his other hand.
 A section
 B surface
 C screen
 D suction

Test 54

SPECIALIZED LANGUAGE AREAS

- 1 What is a ___ source of information about the function of the brain regions?
A key
B kernel
C nucleus
D nuclear
- 2 It is certainly the effects of ___ produced to them.
A damage
B damages
C generation
D growth
- 3 In humans, ___ are a precious source of information.
A systems
B statues
C strokes
D statures
- 4 They have long ___ a “natural laboratory“ for studying of brain.
A reported
B certified
C composed
D provided
- 5 Many important things have become ___ by studying them.
A offered
B afraid
C known
D deleted
- 6 We know that the left hemisphere of our brain usually ___ the specialized language areas.
A contracts
B provokes
C prefers
D contains
- 7 This certainly holds true for 97 percent of right-___ people.
A hand
B handed
C hold
D half
- 8 In case of injury to the left hemisphere, a child may ___ language in the right one!
A develop
B create
C opt
D hesitate
- 9 The formula is: the younger the child, the better the ____ .
A recovery
B alphabet
C respiratory
D operation
- 10 This means that human brains are ___ of adapting to difficult circumstances.
A able
B capable
C communicative
D argumentative
- 11 Of course, this holds true if the damage occurs ___ enough.
A instant
B early
C ever
D impact
- 12 The so-called Broca’s area is named ___ Paul Broca.
A after
B meaning
C under
D measuring
- 13 He discovered the first language area ___ the left hemisphere.
A within
B worthy
C winding
D wounded
- 14 He discovered that area while ___ patients with aphasia.
A improving
B studying
C organizing
D enhancing

- 15 About 19% of left-handed people have ___ language areas in the right hemisphere.
 A expert
 B their
 C our
 D about
- 16 Many of them have some language ___ in both the left and the right hemisphere.
 A arteries
 B membership
 C abilities
 D statue
- 17 The two hemispheres are thought to ___ to the processing of language.
 A censure
 B circulate
 C contribute
 D complicate
- 18 This also ___ to *understanding* of language.
 A veins
 B means
 C waves
 D frequents
- 19 The left hemisphere processes the ___ meaning of prosody.
 A languages
 B linguistic
 C *lingua franca*
 D language
- 20 *Prosody* is the term relating to the rhythm, stress, and intonation of ___ speech.
 A cranial
 B cavity
 C connected
 D central
- 21 The right hemisphere processes the emotions ___ by prosody.
 A eroded
 B differed
 C conveyed
 D weighed
- 22 What can happen if a ___ has damage to the left hemisphere?
 A child
 B pain
 C lining
 D mucus
- 23 Aphasia is the name of a language ___, you know.
 A disorder
 B order
 C interest
 D intention
- 24 Broca's area doesn't just handle getting language out in a ___ sense.
 A motivate
 B motor
 C measure
 D mystery
- 25 It seems to be more generally ___ in the ability to process grammar itself.
 A involved
 B arranged
 C positioned
 D treated
- 26 It is certainly in charge of at least the more complex ___ of grammar.
 A channels
 B aspects
 C theoreticians
 D protections
- 27 It handles distinguishing a sentence in ___ form from a simpler "ordinary" sentence.
 A passive
 B medicinal
 C nominal
 D supposed
- 28 Carl Wernicke was an outstanding German ___.
 A neurologist
 B neuroscience
 C nutritional
 D nutritive
- 29 The so-called *Wernicke's aphasia* does not only affect speech ___.
 A introduction
 B comprehension
 C aspiration
 D formation
- 30 People with Wernicke's aphasia have difficulty ___ the names of objects.
 A observing
 B recalling
 C attending
 D wishing

THE TRAGICAL RELATIONSHIP

- 1 In some parts of the US, community violence has reached ___ proportions.
A epidemic
B disturbance
C epidemic
D density
- 2 What is the proportion suggested by the ___ ?
A foundation
B tolerance
C generation
D findings
- 3 One third or more of ___ city children have been directly victimized.
A inside
B insidious
C inner
D inspection
- 4 What more – almost all the children there have been ___ .
A exploded
B eraded
C eroded
D exposed
- 5 What can we ___ about the youth from other Western countries?
A alter
B arrange
C assume
D assist
- 6 They also experience ___ to violence.
A exposition
B exposure
C expansion
D expense
- 7 However, no epidemiological studies from outside North America have ___ this issue.
A cared
B addressed
C breathed
D advanced
- 8 What about the findings on the psychological ___ of child abuse?
A chances
B control
C continuity
D consequences
- 9 Such findings are related ___ the issue of community violence, of course.
A to
B from
C for
D over
- 10 What did numerous studies ___ this topic describe?
A off
B to
C about
D on
- 11 The ___ of such studies described connections between traumatization and psychopathology.
A plethora
B many
C inspiration
D numberless
- 12 Do you know what ___ associations were suggested?
A revision
B plenty
C most
D specific
- 13 They were suggested by type of ___ and by gender.
A abuse
B muse
C evident
D opened
- 14 Girls were found to ___ more with internalizing symptomatology.
A shout
B report
C show
D react

- 15 Such a research should certainly be ____ .
 A exported
 B inserted
 C conducted
 D strengthened
- 16 Yes, research on the ____ of experience with violence in other communities.
 A apthya
 B surgery
 C members
 D prevalence
- 17 What has research documented ____ the last decade of the twentieth century?
 A from
 B above
 C over
 D under
- 18 There is a link to a series of ____ health problems.
 A injured
 B sane
 C expectation
 D mental
- 19 ____ is internalizing symptomatology, you know.
 A Irrigated
 B Imploded
 C Included
 D Insane
- 20 The problems also include low self-____ , posttraumatic stress, approval of aggression, ...
 A extinguishing
 B extreme
 C exercise
 D esteem
- 21 What have the follow-____ studies demonstrated?
 A about
 B there
 C down
 D up
- 22 Community violence is associated with ____ and antisocial behaviour.
 A aggravation
 B outlook
 C esteemed
 D aggressive
- 23 On the other hand, boys showed more externalizing ____ .
 A security
 B invention
 C introduction
 D behaviour
- 24 Suicidal ____ were demonstrated to be higher in abused children and adults.
 A damages
 B struggle
 C tendons
 D tendencies
- 25 Some controversy ____ suicidality in physically abused children.
 A surrounds
 B supposes
 C sways
 D supports
- 26 Research on the consequences of exposure to community violence is ____ .
 A growingly
 B grown
 C growth
 D growing
- 27 Only a few studies have sought to ____ the link with suicidal inclinations.
 A meditate
 B operate on
 C inform
 D elucidate
- 28 It is important to ____ the specific risk factors, naturally.
 A identity
 B insure
 C identify
 D ensure
- 29 What about suicidal ideation and ____ self-harm in adolescents exposed to violence?
 A devastated
 B dense
 C deliberate
 D definition
- 30 What does this ____ study address, do you know that?
 A cordial
 B cardiac
 C current
 D coronary

Test 56

**A TYPHOID CARRIER
SOMEWHERE IN THE HOSPITAL...**

- 1 To begin with... let's ____ what we've done so far.
A surround
B succeed
C suppose
D summarize
- 2 He addressed them holding his ____ of notes.
A ground
B lancet
C page
D pincer
- 3 His ____ moved theatrically around the room.
A desk
B space
C standing
D glance
- 4 He's ____ this – they all thought at that moment.
A expressing
B caring
C enjoying
D carefully
- 5 The picture so ____ is that we have two definite cases of typhoid.
A good
B one
C away
D far
- 6 At the same time, we also have four ____ cases.
A suspected
B steered
C afterward
D about
- 7 To be ____ is that all of the cases are hospital employees.
A noted
B born
C stitched
D sewed
- 8 Generally speaking, there's a rising ____, chills, and a slow pulse.
A flavour
B favoured
C fewer
D fever
- 9 There's also a low blood ____ and, naturally, the characteristic rose spots.
A counter
B about
C under
D count
- 10 In addition to all that a patient will probably ____ of a dull headache and general aching.
A continue
B connect
C complain
D circulate
- 11 Some patients may say they're ____ in the daytime.
A drowning
B drought
C drowsy
D dropped
- 12 One thing to look ____ for also is bronchitis.
A down
B out
C more
D away
- 13 You may encounter nosebleed, too, and, of course, a tender, ____ spleen.
A swell
B swollen
C well
D woolen
- 14 I take it that typhoid ____ are being arranged.
A shots
B shoots
C spots
D supports

- 15 We may ___ ourselves fortunate that no patients are affected yet.
A cleanse
B count
C crease
D cumulate
- 16 Because of the number of cases I'm sure something is ___ to you...
A effervescent
B evident
C monitored
D morbidity
- 17 It is rather obvious that we have a typhoid ___ somewhere in the hospital.
A trading
B undertaker
C carrier
D understood
- 18 Now, I may say that I'm as ___ as everyone else must have been.
A shopped
B exemplified
C shocked
D shortened
- 19 Examination of food handlers here hasn't been done for ___ some time now.
A quiet
B certain
C certified
D quite
- 20 Then, after a barely ___ pause, he went on with some new data.
A paid
B preserved
C precious
D perceptible
- 21 I realize there will be some of you who are not ___ with typhoid.
A familiar
B family
C famed
D famous
- 22 This is why I'm going to run over the ___ early-stage symptoms.
A pretentious
B principal
C prerogative
D principle
- 23 Yes, they are arranged, for all employees and ____ .
A staff
B stuff
C start
D stunt
- 24 Of, course, they are also arranged for patients who are well ___ to have them.
A instant
B fine
C enough
D even
- 25 The immediate problem is to locate the ___ of infection.
A security
B sorcerer
C source
D saucer
- 26 There was the failure to check food handlers ___ over the past six months.
A prolonged
B proportionately
C provisional
D properly
- 27 This is why it is logical that we should suspect food as a ___ of contamination.
A medicine
B meditation
C mean
D means
- 28 ___ this reason there must be a medical inspection of all food handlers.
A From
B For
C Because
D Connecting
- 29 Facilities are being set ___ now in the outpatient clinics.
A on
B at
C up
D from
- 30 I understand that all the internists were ___ before this meeting.
A notified
B noted
C noticed
D notorious

Test 57

**WHEN ECONOMICS
AND ENDOCRINOLOGY MEET...**

- 1 Have you heard of any ____ about what can be met on the trading floor?
A steering
B stereotypes
C stethoscopes
D strangulation
- 2 Given such, it should be no surprise that a study has attracted attention.
A get
B to get
C going
D got
- 3 The word is of a study ____ trading and testosterone!
A leaving
B looking
C lacking
D linking
- 4 Researchers from Cambridge University studied 17 male traders ____ work.
A on
B at
C in
D in the
- 5 For each ____, they discovered temporarily higher testosterone levels.
A individual
B individually
C indefinite
D indefinitely
- 6 These higher levels seemed to be both the cause and ____ of a profitable trading day.
A countdown
B connection
C contemplation
D consequence
- 7 Yet one can have too ____ of a good thing.
A many
B much
C more
D misery
- 8 Here "arousal" referred to skin ____, you know.
A charging
B consumption
C completion
D conductivity
- 9 What may ____ attention here is a speculation.
A create
B catch
C collide
D consume
- 10 The speculation is that markets might be more ____ if more traders were women.
A stable
B striving
C stressful
D striking
- 11 Education researchers have already found that girls are a positive ____ in the classroom.
A influence
B inhibition
C importance
D intuition
- 12 Might not the same ____ true on the trading floor?
A is
B be
C has
D holds
- 13 How many women were there in the trading room that played ____ to this study?
A trade
B knowledge
C guest
D host
- 14 There were only four female traders out ____ 260!
A of
B from
C in
D in the

- 15 On volatile days the traders are flooded with cortisol, a ___ hormone.
 A stressing
 B stressed
 C stress
 D strong
- 16 Too much testosterone turns calculated risk-___ into recklessness.
 A advertising
 B staking
 C making
 D taking
- 17 One of the researchers was ___ once a Wall Street trader.
 A hormone
 B himself
 C hormonal
 D hurrying
- 18 What is his comment, which is contrary to ___ stereotypes?
 A macho
 B made
 C moment
 D maximum
- 19 These hormonal surges are masked by ___ of icy calm.
 A distances
 B differences
 C determinations
 D demeanours
- 20 This is certainly not the first research to suggest that traders can be ____ .
 A impersonal
 B irrational
 C implanted
 D immobilized
- 21 It is not even the first study ___ the physiology of traders.
 A to investigate
 B investigated
 C investigation
 D increasing
- 22 Earlier researchers discovered that traders ___ "arousal" at moments of volatile trading.
 A extracted
 B exposed
 C exterminated
 D experienced
- 23 Of course, if the ___ is correct, that will need to change.
 A home
 B hunch
 C hit
 D hatch
- 24 Managers could hire traders after holding ___ trials of trading ability.
 A frown
 B find
 C bliss
 D blind
- 25 Women are at lower ___ of testosterone poisoning.
 A allergy
 B risk
 C risky
 D thread
- 26 That is why it is possible that women might ___ at such trials.
 A brilliant
 B fantastic
 C excel
 D excuse
- 27 Another bastion of _____ is the world of professional US orchestras.
 A means
 B modes
 C masculinity
 D mastery
- 28 Such a recruitment ___ is surely worth a try.
 A doing
 B scheme
 C shade
 D stadia
- 29 But what if few women ___ such trials?
 A host
 B wear
 C win
 D compound
- 30 Elevator music and fish tanks are ___ tools for reducing stress!
 A vitality
 B virus
 C vital
 D viral

Test 58

WHY DO YOU FEEL SO TIRED?

- 1 Have you ever thought seriously about why ___ feel so tired?
A you
B do you
C are you
D have you
- 2 What does it mean to struggle ___ out of bed in the morning?
A get
B to get
C going
D got
- 3 How do you understand the meaning of *to be ___ out* all the time?
A *wearing*
B *wore*
C *wear*
D *worn*
- 4 Chronic tiredness is one of the most ___ reasons people go to their GPs.
A common
B complete
C combined
D careful
- 5 At ___ time, one in every ten people has prolonged fatigue, did you know that?
A one
B any
C a
D definite
- 6 Feeling exhausted or run ___ could be down to the breakneck pace of our modern lifestyle.
A up
B down
C away
D about
- 7 Our lifestyle can ___ havoc with our sleeping patterns, of course.
A care
B play
C bring
D certify
- 8 The left ventricle of the heart is known as the main pumping ____ .
A channel
B choice
C chance
D chamber
- 9 In such a case, the heart stops pumping blood effectively ____ the body.
A round
B about
C under
D after
- 10 The condition causes such tiredness as there is less oxygen ____ in the body.
A connecting
B representing
C circulating
D dividing
- 11 Such a condition can be ____, or even triggered by some infection.
A inherited
B inheritance
C implemented
D intact
- 12 Did you know that as ____ as 125,000 Britons suffered from this condition?
A more
B much
C many
D mighty
- 13 If ____, this serious condition can prove fatal.
A untreated
B unknown
C exclusive
D understood
- 14 Are there any drugs to ____ the symptoms?
A improve
B propose
C support
D include

- 15 In such cases, doctors must not ___ the possibility of serious illness.
 A exclude
 B intensify
 C characterize
 D single
- 16 Tiredness itself is not an illness, but rather will be the ___ of a condition.
 A addition
 B symptom
 C member
 D article
- 17 Very often it could be that being tired is due to an ___ medical problem.
 A underlining
 B understanding
 C underlying
 D underpaid
- 18 We can ___ what could be causing your tiredness with the help of a range of experts.
 A examine
 B exam
 C expect
 D extract
- 19 If one is tired, feeling weak and breathless, what do you think ___ be a possible cause?
 A should
 B could
 C must
 D shall
- 20 If there is a chest pain after heavy meals or ___, one should hurry to see his doctor.
 A explanations
 B exploits
 C extremes
 D exercising
- 21 Is *cardiomyopathy* the name of a ___ of the heart muscle?
 A disease
 B difficulty
 C difference
 D volume
- 22 Cardiomyopathy is known to cause the heart walls to ____ .
 A thicken
 B pain
 C execute
 D persist
- 23 By relaxing the blood vessels, ace ___ improve blood flow from the heart.
 A inhibitions
 B inhibitors
 C introducing
 D implants
- 24 What else can reduce the heart's workload and increase ___ efficiency?
 A it is
 B it's
 C its
 D it
- 25 Hay fever is a well known form of ___, you know that!
 A allergic
 B allergy
 C position
 D treatment
- 26 When one is feeling groggy, with dry mouth, constipation, diarrhea... what is ___ ?
 A to blame
 B founded
 C the name
 D protected
- 27 The truth is that what makes sufferers tired is their anti-histamine ____ .
 A medication
 B medicinal
 C medic
 D surgeon
- 28 These drugs act on receptors in the brain that ___ one feel sleepy.
 A do
 B make
 C produce
 D create
- 29 Older forms of antihistamine were highly effective ___ treating allergies.
 A in
 B at
 C about
 D form
- 30 Do not give children some of these tablets for allergies ___ exam time!
 A on
 B in
 C at
 D while

Test 59

**WORKING TOGETHER FOR THE BENEFIT
OF THE TOTAL BEING...**

- 1 The human body is made ____ of billions of smaller structures.
A up
B out
C from
D for
- 2 These smaller structures, as we know, are of four ____ kinds.
A minors
B minor
C major
D mayor
- 3 There are billions of microscopic parts, each with their own ____ .
A intestines
B insides
C identity
D inflammations
- 4 They all work together in an organized manner for the ____ of the total being.
A wrinkles
B benefit
C bruises
D cartilage
- 5 Cells have long been recognized as the simplest units of living ____ .
A monitor
B matter
C membrane
D master
- 6 Cells compose all living things, they can maintain life and ____ themselves.
A reproduce
B oxidize
C repel
D produce
- 7 The human body begins as a single, newly ____ cell.
A founded
B fried
C fertilized
D flushed
- 8 These substances are ____ to a specific tissue and give it distinctive characteristics.
A uniform
B folded
C chosen
D unique
- 9 There are four main tissue ____ in the body, you know.
A trajectories
B tenders
C tones
D types
- 10 An organ is an organization of ____ different kinds of tissues.
A solely
B several
C circling
D not
- 11 The tissues are arranged so that they can ____ a special function.
A produce
B inform
C perform
D operate
- 12 Muscle and connective tissues form the stomach ____ .
A way
B line
C curve
D wall
- 13 Epithelial and connective tissues form the stomach ____ .
A molar
B mole
C lining
D navel
- 14 A ____ is an organization of varying numbers and kinds of organs.
A system
B head
C status
D leg

- 15 According to some ____, an average-sized adult body consists of 100 trillion cells.
 A estimates
 B intensities
 C documents
 D journalists
- 16 Tissues are more ____ units than cells, of course.
 A caring
 B solid
 C complex
 D artificial
- 17 A tissue is an organization of great many ____ cells.
 A similar
 B synthetic
 C systemic
 D solidary
- 18 These cells have the structure that enables them to ____ as a unit.
 A function
 B extract
 C frustrate
 D evade
- 19 There are varying amounts and kinds of ____ substance between the cells.
 A interstellar
 B intercellular
 C impartial
 D inadequate
- 20 In other words, a ____ material fills the space between the cells.
 A proper
 B surgical
 C nonliving
 D first-aid
- 21 This material may be ____ in some tissues and minimal in others.
 A abundant
 B difficult
 C surrounding
 D versatile
- 22 This matrix may contain special substances such as ____ and fibers.
 A sinuses
 B pads
 C raws
 D salts
- 23 What do bones, tendons, cartilage and ligaments ____ ?
 A find
 B activate
 C form
 D irritate
- 24 What is the essential function of the lymph, lymph ____ and vessels.
 A knots
 B structures
 C nodes
 D clots
- 25 Have you ever heard of the ____ T- and B-cells?
 A called
 B so-called
 C positioned
 D treated
- 26 What do mouth, oesophagus, stomach, small and large ____ do?
 A toes
 B forehead
 C intestine
 D eyebrow
- 27 This holds true for all living things, starting from single-____ plants.
 A cellulose
 B celled
 C celestial
 D minded
- 28 Each main tissue in the body is ____ for specific functions.
 A done
 B designed
 C designated
 D deemed
- 29 Where do nervous tissues ____ ?
 A extend
 B attract
 C invite
 D accept
- 30 Can't you see some ____ in the title of this text?
 A symptoms
 B symbolics
 C surroundings
 D statutes

Test 60

THE X-FACTOR

- 1 There was an ____ of euphoria in the corridors of that hospital.
A administration
B assembly
C act
D air
- 2 This was happening in the Hospital for ____ Children, in February, 2001.
A Small
B Sick
C Big
D Brave
- 3 An incredible ____ was happening to an 11-month-old baby.
A transition
B tradition
C trading
D transformation
- 4 The baby boy was lying in an ____ bubble.
A open
B airtight
C available
D inverted
- 5 The truth is that history was being ____ there.
A omitted
B made
C traded
D shaded
- 6 What had the doctors ____ there for the first time?
A done
B owned
C open
D forgotten
- 7 They had used their knowledge of the genes involved in a ____ disease to cure it.
A fatal
B playful
C formal
D hole
- 8 His only direct contact with his mother, father and nurse was through plastic ____ .
A glasses
B connections
C gloves
D room
- 9 Meanwhile, doctors took out a few million of his bone ____ cells.
A marrow
B arrangement
C master
D application
- 10 They managed to ____ a healthy gene in them.
A interpret
B interrupt
C insert
D inspire
- 11 They put them back in form of a simple ____ of 20-30 millilitres of fluid.
A instruction
B insertion
C implication
D infusion
- 12 Did you know anything about that group of cells known as '____' cells?
A start
B staring
C stem
D stork
- 13 What happens when these cells ____ the right chemical signals?
A receive
B reply
C report
D restore
- 14 They ____, to become red and white blood cells.
A impress
B multiply
C suppress
D intake

- 15 Gene therapy's promise to correct nature's ___ was being brought to life.
 A floss
 B interests
 C flaws
 D insights
- 16 After years of research, the human genetic ___ has been cracked.
 A core
 B side
 C code
 D affection
- 17 Now more and more of the defects will come within reach of ____ .
 A readiness
 B proper
 C repair
 D prepare
- 18 When the little boy was ___ to hospital, he was facing death.
 A afforded
 B admitted
 C attracted
 D affected
- 19 He was facing death from a rare ___ disorder called *X-linked SCID*.
 A inherited
 B infected
 C inspected
 D internal
- 20 This is a disease that causes children to ___ without a working immune system.
 A be borne
 B be born
 C reborn
 D birth
- 21 Unfortunately, for them the ___ infection can be deadly!
 A slightest
 B lighter
 C brighter
 D voluminous
- 22 For several days, the boy just ___ in his bubble.
 A lie
 B lay
 C lain
 D laid
- 23 They gave the boy what they hope will be a lifetime of normal ____ .
 A immunization
 B immunity
 C immune
 D implementation
- 24 Within 15 days, doctors knew from tests that the new gene was ____ .
 A doing
 B working
 C playing
 D staying
- 25 The marvel for the parents was watching the change in their ____, underweight boy.
 A sickle
 B slowly
 C sickly
 D daily
- 26 The point was that ___ their eyes the boy was beginning to get better.
 A before
 B behind
 C in the front of
 D while
- 27 The ugly red blotches on his skin gradually ___ away.
 A faded
 B frowned
 C meditated
 D surged
- 28 He put on weight, and his ___ became easier.
 A bending
 B borrowing
 C breathing
 D brightness
- 29 Three months after the beginning of the ____, they were told they could take him home.
 A intuition
 B treatment
 C aspiration
 D formation
- 30 This first ___ of gene therapy will have to be further proved over time.
 A donation
 B achievement
 C constitution
 D arrangement

KLJUČ – REŠENJA TESTOVA

TEST 1

1b 2c 3a 4b 5c 6d 7c 8a 9b 10d 11b 12d 13b 14b 15b
16c 17d 18b 19c 20a 21b 22b 23c 24d 25c 26b 27b 28c 29c 30d

TEST 2

1d 2a 3c 4d 5a 6a 7a 8c 9d 10b 11d 12b 13d 14d 15d
16a 17b 18d 19a 20c 21d 22d 23a 24b 25a 26d 27d 28a 29d 30a

TEST 3

1c 2d 3b 4c 5d 6d 7d 8a 9c 10a 11c 12a 13c 14c 15c
16d 17a 18c 19d 20b 21c 22c 23d 24a 25d 26c 27c 28d 29d 30a

TEST 4

1a 2b 3d 4a 5b 6b 7b 8a 9d 10b 11d 12b 13d 14d 15b
16c 17d 18b 19c 20a 21b 22b 23c 24b 25c 26d 27d 28c 29c 30b

TEST 5

1a 2c 3d 4b 5b 6c 7b 8a 9a 10d 11a 12d 13a 14b 15a
16c 17c 18b 19b 20a 21a 22b 23b 24d 25c 26b 27a 28c 29b 30d

TEST 6

1a 2b 3d 4a 5a 6a 7a 8c 9d 10b 11d 12c 13a 14a 15d
16a 17b 18d 19a 20c 21d 22d 23a 24b 25a 26a 27a 28a 29c 30b

TEST 7

1b 2a 3c 4b 5a 6a 7a 8c 9b 10d 11b 12d 13b 14b 15b
16a 17d 18b 19a 20c 21b 22b 23a 24d 25a 26b 27b 28a 29a 30d

TEST 8

1c 2d 3b 4c 5d 6d 7d 8b 9c 10a 11c 12a 13c 14c 15c
16d 17c 18c 19d 20b 21c 22c 23d 24a 25d 26c 27c 28d 29d 30a

TEST 9

1b 2b 3c 4a 5c 6b 7c 8d 9a 10c 11c 12c 13a 14a 15a
16c 17c 18b 19b 20c 21a 22d 23b 24c 25c 26b 27a 28d 29b 30c

TEST 10

1b 2c 3d 4a 5b 6c 7d 8b 9c 10d 11b 12c 13d 14a 15a
16b 17c 18d 19a 20c 21c 22b 23b 24c 25d 26a 27b 28c 29d 30a

TEST 11

1a 2b 3c 4b 5c 6c 7c 8a 9d 10b 11d 12b 13d 14d 15b
16c 17d 18b 19c 20c 21b 22b 23c 24d 25c 26b 27b 28c 29c 30d

TEST 12

1a 2b 3c 4a 5b 6a 7b 8c 9a 10c 11d 12c 13a 14d 15a
16a 17c 18a 19a 20c 21a 22a 23b 24c 25a 26a 27a 28a 29b 30b

TEST 13

1b 2c 3c 4b 5c 6c 7c 8b 9c 10a 11c 12a 13c 14c 15d
16c 17a 18c 19d 20b 21c 22c 23c 24d 25c 26b 27b 28c 29c 30d

TEST 14

1d 2a 3c 4d 5a 6a 7a 8d 9a 10c 11a 12c 13a 14a 15a
16b 17b 18a 19b 20c 21a 22a 23b 24b 25a 26d 27a 28a 29b 30b

TEST 15

1a 2c 3d 4b 5b 6c 7b 8a 9a 10c 11b 12c 13a 14b 15b
16b 17d 18a 19c 20d 21b 22a 23b 24c 25c 26a 27a 28c 29b 30d

TEST 16

1a 2d 3d 4b 5b 6a 7d 8c 9b 10d 11b 12b 13b 14d 15a
16c 17d 18b 19c 20c 21a 22b 23c 24d 25b 26b 27b 28b 29a 30b

TEST 17

1b 2c 3d 4b 5c 6c 7c 8d 9b 10c 11b 12c 13b 14b 15b
16c 17c 18b 19c 20d 21b 22b 23c 24c 25c 26b 27b 28c 29c 30c

TEST 18

1b 2c 3b 4a 5b 6d 7b 8b 9d 10b 11a 12b 13c 14d 15a
16b 17c 18d 19b 20a 21b 22c 23b 24a 25b 26c 27b 28d 29b 30a

TEST 19

1a 2b 3a 4c 5a 6d 7a 8c 9a 10b 11a 12d 13a 14b 15b
16a 17c 18a 19d 20a 21b 22a 23a 24c 25a 26b 27a 28c 29a 30d

TEST 20

1b 2c 3d 4a 5b 6c 7d 8d 9c 10b 11a 12d 13c 14b 15a
16b 17c 18a 19b 20c 21d 22a 23d 24c 25b 26a 27d 28c 29b 30a

TEST 21

1c 2c 3d 4c 5c 6c 7c 8d 9c 10c 11a 12c 13a 14c 15c
16b 17c 18c 19b 20d 21c 22c 23b 24c 25c 26a 27c 28b 29c 30d

TEST 22

1b 2c 3d 4b 5c 6c 7b 8d 9a 10c 11a 12c 13a 14b 15c
16d 17a 18c 19d 20b 21c 22c 23b 24c 25d 26a 27b 28c 29d 30a

TEST 23

1a 2b 3a 4b 5c 6a 7b 8b 9c 10b 11a 12d 13b 14c 15a
16b 17c 18a 19b 20a 21b 22d 23b 24a 25d 26b 27a 28b 29c 30d

TEST 24

1a 2b 3c 4b 5b 6b 7c 8d 9a 10c 11c 12d 13a 14a 15b
16b 17d 18b 19d 20c 21d 22a 23b 24d 25b 26b 27c 28b 29b 30d

TEST 25

1d 2c 3a 4d 5c 6c 7c 8a 9d 10b 11d 12b 13d 14d 15a
16b 17c 18a 19b 20d 21a 22a 23c 24b 25c 26d 27d 28c 29c 30b

TEST 26

1d 2b 3a 4a 5a 6a 7d 8d 9a 10c 11c 12a 13d 14a 15a
16b 17c 18c 19b 20a 21c 22c 23b 24c 25c 26b 27a 28c 29d 30b

TEST 27

1c 2b 3d 4b 5d 6b 7c 8d 9c 10b 11b 12a 13a 14d 15a
16b 17c 18d 19d 20c 21b 22a 23b 24c 25b 26a 27a 28b 29b 30c

TEST 28

1a 2c 3d 4a 5b 6b 7b 8c 9b 10d 11b 12b 13a 14c 15b
16d 17d 18b 19c 20d 21b 22b 23b 24d 25c 26a 27c 28d 29c 30d

TEST 29

1a 2c 3c 4c 5b 6b 7d 8d 9d 10c 11c 12b 13b 14a 15a
16a 17c 18c 19b 20b 21d 22d 23b 24b 25d 26d 27a 28a 29c 30b

TEST 30

1b 2c 3d 4b 5a 6b 7d 8c 9a 10c 11b 12c 13d 14a 15a
16b 17b 18a 19c 20d 21b 22b 23b 24c 25b 26b 27c 28b 29c 30c

TEST 31

1d 2d 3d 4a 5a 6a 7b 8a 9a 10c 11c 12c 13a 14b 15b
16b 17c 18c 19c 20d 21d 22a 23b 24c 25d 26a 27b 28c 29d 30d

TEST 32

1a 2c 3d 4a 5c 6d 7b 8c 9b 10d 11a 12b 13b 14c 15c
16d 17c 18a 19d 20d 21a 22c 23b 24c 25d 26a 27b 28c 29d 30d

TEST 33

1a 2b 3c 4b 5b 6c 7b 8d 9d 10c 11a 12b 13c 14c 15c
16c 17c 18c 19d 20d 21a 22b 23c 24c 25a 26a 27b 28c 29d 30a

TEST 34

1b 2b 3c 4a 5b 6c 7c 8a 9b 10c 11c 12c 13d 14b 15c
16c 17d 18d 19d 20c 21b 22a 23b 24b 25b 26c 27a 28a 29b 30b

TEST 35

1a 2a 3d 4d 5b 6b 7c 8d 9d 10a 11a 12b 13b 14b 15a
16a 17b 18b 19c 20c 21d 22d 23c 24c 25d 26d 27a 28a 29b 30b

TEST 36

1d 2b 3d 4d 5c 6b 7d 8d 9c 10b 11d 12d 13b 14d 15c
16b 17d 18c 19b 20d 21c 22b 23d 24c 25d 26b 27b 28a 29a 30a

TEST 37

1b 2b 3b 4a 5b 6b 7b 8d 9d 10c 11a 12c 13c 14a 15a
16b 17b 18c 19d 20d 21d 22a 23c 24c 25b 26c 27a 28b 29c 30a

TEST 38

1c 2b 3d 4c 5b 6d 7d 8d 9d 10c 11c 12c 13b 14a 15c
16b 17c 18d 19b 20b 21b 22c 23a 24c 25c 26a 27a 28a 29c 30d

TEST 39

1b 2b 3d 4a 5a 6d 7a 8a 9b 10c 11d 12a 13c 14d 15b
16c 17d 18a 19b 20c 21b 22c 23a 24a 25a 26b 27b 28c 29c 30b

TEST 40

1a 2b 3c 4a 5a 6c 7d 8d 9d 10b 11a 12b 13c 14a 15d
16d 17b 18b 19b 20a 21a 22b 23b 24c 25d 26c 27a 28c 29a 30b

TEST 41

1a 2a 3d 4d 5b 6b 7c 8d 9a 10b 11c 12d 13a 14b 15c
16a 17b 18c 19d 20a 21b 22c 23c 24d 25b 26a 27d 28c 29b 30c

TEST 42

1d 2a 3c 4c 5c 6d 7b 8c 9c 10a 11b 12d 13a 14b 15d
16c 17d 18a 19a 20c 21b 22b 23b 24a 25b 26a 27c 28d 29d 30a

TEST 43

1d 2b 3d 4b 5c 6c 7d 8c 9d 10c 11c 12d 13d 14b 15b
16b 17a 18a 19a 20d 21d 22b 23d 24a 25b 26b 27a 28a 29a 30b

TEST 44

1b 2b 3b 4a 5a 6a 7b 8a 9c 10d 11a 12c 13d 14a 15c
16d 17b 18c 19d 20b 21c 22d 23c 24d 25a 26c 27d 28b 29c 30d

TEST 45

1a 2d 3c 4a 5d 6b 7a 8a 9b 10c 11a 12b 13c 14a 15a
16c 17c 18c 19a 20b 21b 22d 23b 24b 25b 26b 27a 28b 29a 30a

TEST 46

1a 2b 3c 4a 5b 6b 7b 8d 9a 10c 11a 12c 13a 14a 15a
16b 17c 18a 19b 20d 21a 22a 23b 24c 25b 26a 27a 28b 29b 30c

TEST 47

1b 2d 3c 4a 5a 6d 7c 8c 9b 10d 11b 12a 13c 14c 15a
16d 17d 18b 19c 20c 21b 22a 23c 24b 25b 26b 27c 28c 29d 30c

TEST 48

1a 2a 3d 4d 5b 6b 7c 8d 9d 10c 11c 12a 13a 14b 15c
16c 17c 18a 19a 20d 21d 22d 23b 24c 25c 26a 27d 28b 29a 30d

TEST 49

1b 2a 3c 4a 5a 6c 7c 8d 9b 10d 11c 12b 13b 14c 15a
16a 17b 18a 19a 20c 21b 22b 23d 24d 25c 26a 27c 28d 29a 30b

TEST 50

1a 2b 3c 4c 5a 6b 7c 8d 9b 10d 11a 12b 13c 14a 15b
16a 17c 18a 19c 20d 21d 22b 23b 24b 25b 26c 27d 28c 29d 30c

TEST 51

1b 2a 3d 4a 5a 6c 7b 8d 9c 10a 11a 12b 13b 14a 15c
16b 17c 18b 19c 20d 21d 22c 23b 24c 25c 26b 27c 28d 29c 30c

TEST 52

1c 2b 3d 4c 5a 6d 7b 8b 9a 10a 11d 12c 13c 14c 15b
16d 17c 18c 19c 20d 21d 22b 23b 24b 25a 26a 27b 28c 29a 30d

TEST 53

1a 2b 3c 4b 5c 6d 7b 8d 9c 10b 11c 12b 13a 14c 15c
16d 17a 18b 19c 20b 21c 22d 23b 24a 25a 26b 27c 28d 29a 30d

TEST 54

1a 2a 3c 4d 5c 6d 7b 8a 9a 10b 11b 12a 13a 14b 15b
16c 17c 18b 19b 20c 21c 22a 23a 24b 25a 26b 27a 28a 29b 30b

TEST 55

1c 2d 3c 4d 5c 6b 7b 8d 9a 10d 11a 12d 13a 14d 15c
16d 17c 18d 19c 20d 21d 22d 23d 24d 25a 26d 27d 28c 29c 30c

TEST 56

1d 2c 3d 4c 5d 6a 7a 8d 9d 10c 11c 12b 13b 14a 15b
16b 17c 18c 19d 20d 21a 22b 23a 24c 25c 26d 27d 28b 29c 30a

TEST 57

1b 2b 3d 4b 5a 6d 7b 8d 9b 10a 11a 12b 13d 14a 15c
16d 17b 18a 19d 20b 21a 22d 23b 24d 25b 26c 27c 28b 29c 30c

TEST 58

1a 2b 3d 4a 5b 6b 7b 8d 9a 10c 11a 12c 13a 14a 15a
16b 17c 18a 19b 20d 21a 22a 23b 24c 25b 26a 27a 28b 29b 30c

TEST 59

1a 2c 3c 4b 5b 6a 7c 8d 9d 10b 11c 12d 13c 14a 15a
16c 17a 18a 19b 20c 21a 22d 23c 24c 25b 26c 27b 28b 29a 30b

TEST 60

1d 2b 3d 4b 5b 6a 7a 8c 9a 10c 11d 12c 13a 14b 15c
16c 17c 18b 19a 20b 21a 22b 23b 24b 25c 26a 27a 28c 29b 30b

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