1. Which of the following cell organelles is partially permeable and determines which substances enter and leave the cell?

(A) Cell wall
(B) Cytoplasm
(C) Chloroplast
(D) Cell membrane

2. Which of the following structures is responsible for energy production in the cell?

(A) Nucleus
(B) Cell wall
(C) Mitochondrion
(D) Cell membrane

3. Which energy conversion takes place in the chloroplast during photosynthesis?

(A) Light energy → heat energy
(B) Chemical energy → light energy
(C) Light energy → chemical energy
(D) Heat energy → chemical energy

4. The structure responsible for the transfer of characteristics from parents to offspring is the

(A) vacuole
(B) cytoplasm
(C) chromosome
(D) cell membrane

5. Which of the following shapes describes molar teeth?

(A) Pointed
(B) Rounded
(C) Flat-topped
(D) Chisel-shaped

6. Which of the following processes is associated with the breakdown of food into simple, soluble molecules?

(A) Egestion
(B) Digestion
(C) Absorption
(D) Assimilation

7. In human beings, aerobic respiration occurs in the

(A) nucleus
(B) vacuole
(C) cytoplasm
(D) mitochondria

8. Which of the following gases binds permanently to haemoglobin in red blood cells?

(A) Chlorine
(B) Ammonia
(C) Sulphur dioxide
(D) Carbon monoxide

9. Which of the following statements concerning respiration is true?

(A) Aerobic respiration produces oxygen while anaerobic respiration produces carbon dioxide.
(B) Anaerobic respiration produces more energy than aerobic respiration.
(C) Aerobic respiration requires oxygen while anaerobic respiration does not require oxygen.
(D) Aerobic respiration requires carbon dioxide while anaerobic respiration requires oxygen.

10. Which of the following blood groups has no antigen?

(A) A
(B) B
(C) O
(D) AB

11. Which of the following components of blood protects the body by engulfing bacteria?

(A) Plasma
(B) Platelets
(C) Red blood cells
(D) White blood cells

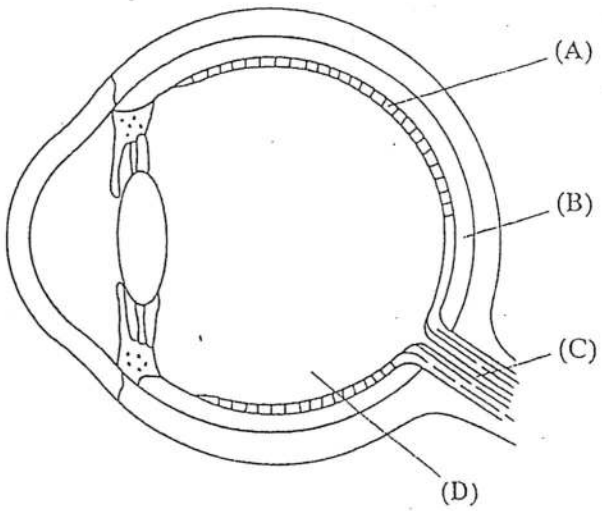
12. The amount of water entering the tissues of the body is controlled by

(A) egestion
(B) nutrition
(C) excretion
(D) osmoregulation

13. Antibodies are important in the human body because they

(A) control hormones
(B) protect against diseases
(C) help make red blood cells
(D) regulate blood glucose levels

Items 14–15 refer to the following diagram which shows several structures in the eye.



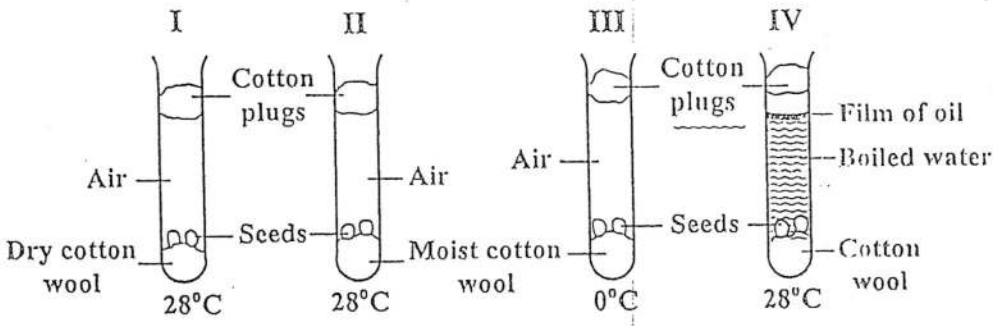
14. Which structure is responsible for carrying impulses to the brain?

15. Which structure is the light sensitive area of the eye?

16. Sperm is stored in the

(A) testes
(B) urethra
(C) prostate gland
(D) seminal vesicle

Item 17 refers to the following diagrams which display seeds under different conditions in four test tubes plugged with cotton wool.



17. In which test tube is germination MOST likely to take place?

(A) I
(B) II
(C) III
(D) IV

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18. Which of the following hormones is produced in emergency situations?

(A) Insulin
(B) Secretin
(C) Prolactin
(D) Adrenaline

Items 19–20 refer to the following types of birth control methods.

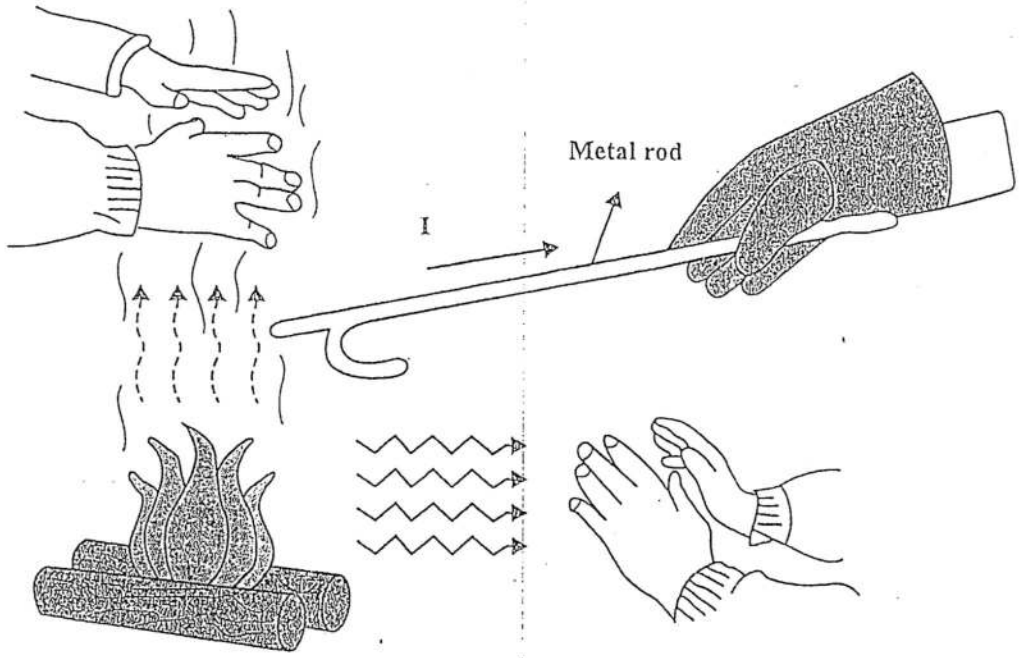
(A) Barrier
(B) Natural
(C) Surgical
(D) Hormonal

Each option may be used once, more than once or not at all.

19. Which method of birth control is likely to be the LEAST effective at preventing pregnancies?

20. Which method of birth control is MOST likely to prevent the spread of sexually transmitted diseases?

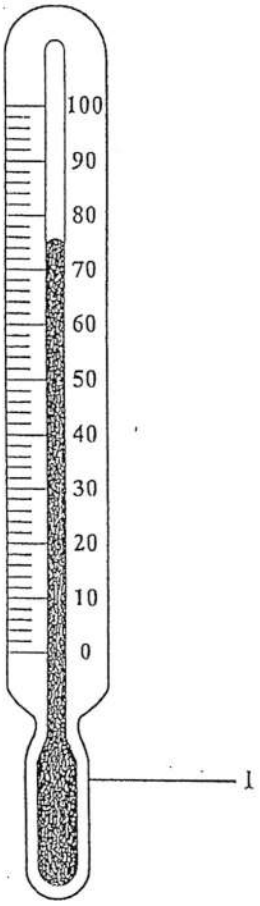
Item 21 refers to the following diagram showing the methods of heat transfer.



21. The method of heat transfer at I is

(A) radiation
(B) convection
(C) conduction
(D) evaporation

Item 22 refers to the following diagram of a thermometer.



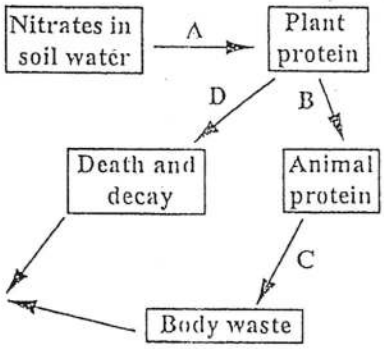
22. The part labelled I is the

(A) stem
(B) bore
(C) bulb
(D) glass

23. Liquids and gases expand when they are heated and contract when they are cooled. These properties are used by the

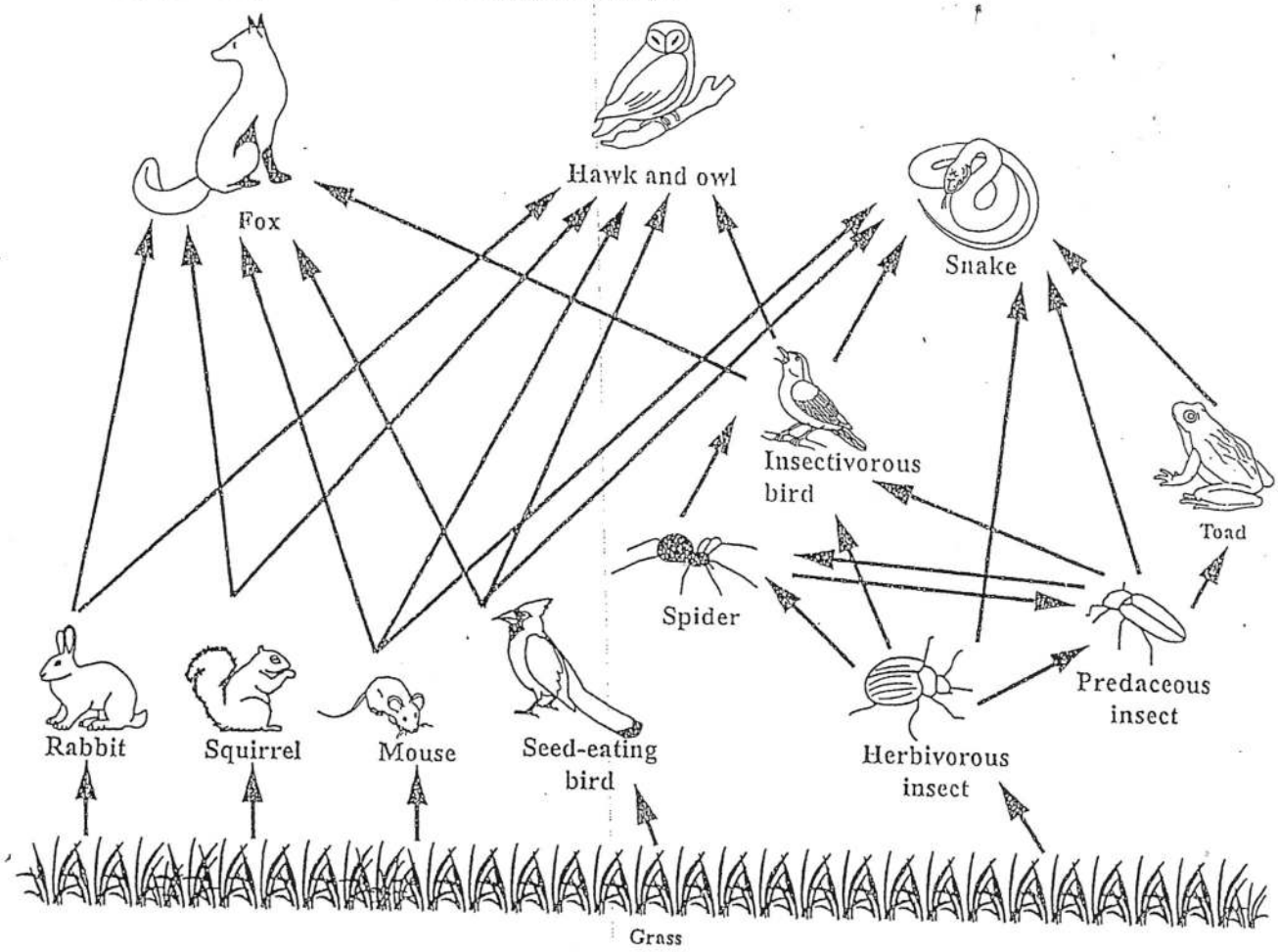
(A) water pump
(B) vacuum cleaner
(C) tyre-pressure gauge
(D) mercury thermometer

Item 24 refers to the following diagram which shows part of a nitrogen cycle.



24. Which of the above processes involves excretion?

Items 25–26 refer to the following food levels.



25. Which of the following is/are secondary consumers?

I. Fox
II. Hawk and owl
III. Seed-eating bird

(A) I only
(B) II only
(C) I and II only
(D) I and III only

26. Which of the following is NOT eaten by snakes?

(A) Toads
(B) Squirrels
(C) Predaceous insects
(D) Herbivorous insects

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27. In weather systems, which kind of front is formed when there is no replacement of air?

(A) Cold
(B) Warm
(C) Stationary
(D) Occluded

28. Hurricanes are characterized by

(A) dry rising air
(B) windy centres
(C) strong winds
(D) high pressures

29. The process by which water passes from the ocean to the atmosphere is

(A) respiration
(B) evaporation
(C) precipitation
(D) condensation

30. Which of the following fishing methods is LEAST efficient?

(A) Drift net
(B) Trawl net
(C) Hand line
(D) Long line

Items 31–32 refer to the following methods of water purification.

(A) Distillation
(B) Filtration
(C) Chlorination
(D) Sedimentation

Each option may be used once, more than once or not at all.

31. Which method involves the settling of heavy suspended material?

32. Which method involves the boiling and condensing of water?

33. The force which acts on all bodies in water, causing them to appear to have less weight is called

(A) lift
(B) thrust
(C) gravity
(D) upthrust

34. Which of the following methods for treating waste require(s) the action of bacteria?

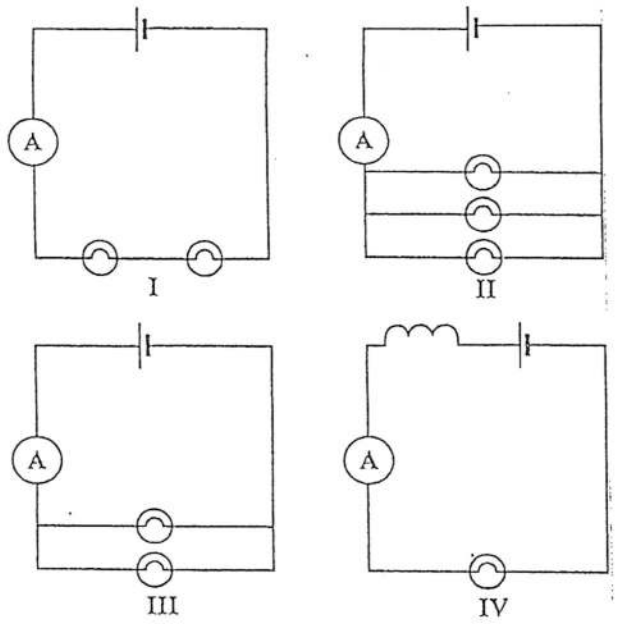
I. Burning
II. Recycling
III. Composting

(A) I only
(B) III only
(C) I and II only
(D) I and III only

35. The MOST effective method used in controlling pests is the

(A) use of traps
(B) use of chemicals
(C) use of another organism
(D) eradication of their breeding places

Item 36 refers to the following diagrams of four circuits.



36. In which TWO circuits are the bulbs wired in parallel?

(A) I and II only
(B) I and IV only
(C) II and III only
(D) III and IV only

37. Electrical wires are usually coated with plastic or rubber so that they

(A) are properly insulated
(B) can be easily installed
(C) can be easily packaged
(D) are protected from breakage

38. Which of the following is NOT a conductor of electricity?

(A) Iron
(B) Rubber
(C) Copper
(D) Carbon

39. Which of the following substances MUST be present for rusting to occur?

I. Oxygen
II. Water
III. Oil

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

Item 40 refers to the following properties of substances.

I. Insulates against both heat and electricity
II. Low boiling and melting points
III. High melting point

40. Which of the above are characteristics of MOST non-metals?

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

41. Plastic is usually used in electrical plugs because it

(A) is fairly strong
(B) has a low density
(C) is a poor conductor of heat energy
(D) is a poor conductor of electricity

42. A substance, X, has a pH of 2. This means that X is

(A) a salt
(B) a base
(C) an acid
(D) an alkali

43. The following data were obtained in an experiment investigating the soil pH in which different crops grow best.

Crop	pH Value of Soil
(A)	4.0–6.0
(B)	6.0–8.0
(C)	8.0–10.0
(D)	10.0–12.0

Which crop grew best in neutral soil?

44. Which of the following substances does NOT form a solution with water?

I. Sugar
II. Flour
III. Sand

(A) I only
(B) II only
(C) I and III only
(D) II and III only

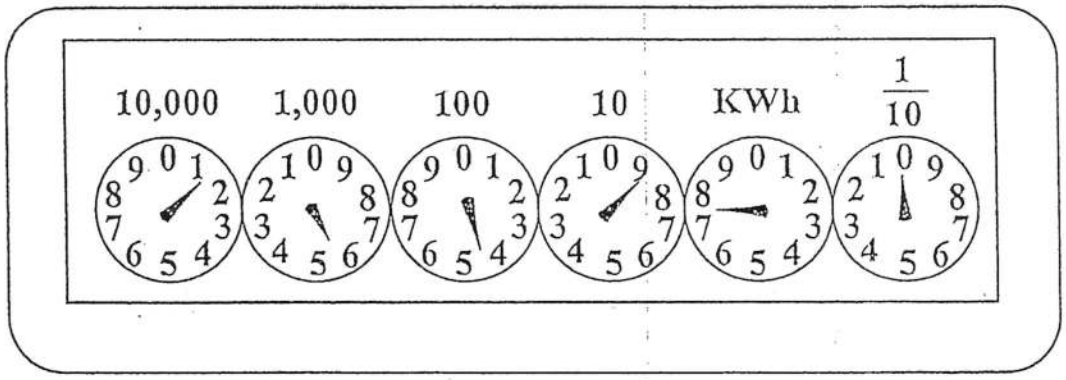
45. Which of the following solvents is NOT suitable for the removal of a grass stain?

(A) Water
(B) Turpentine
(C) Rubbing alcohol
(D) Methylated spirit

46. Which of the following is measured in watts?

(A) Voltage
(B) Power
(C) Current
(D) Resistance

Item 47 refers to the following diagram which represents an analogue meter used to measure the amount of electricity used.



47. What is the reading on the meter?

(A) 15 487 kWh
(B) 16 597 kWh
(C) 25 487 kWh
(D) 26 597 kWh

48. The formula for calculating the amperage of fuses and flexes is

(A) I =W+W
(B) I=W×V
(C) I=W÷V
(D) I=V÷W

49. Which electrical component is designed to melt and break a circuit, if too much current passes through it?

(A) Fuse
(B) Flex
(C) Plug
(D) Switch

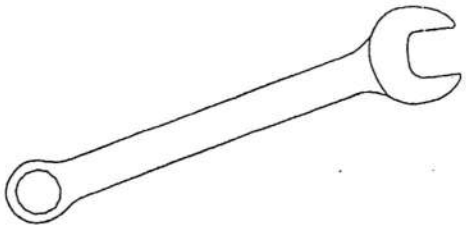
50. The unit of current is the

(A) ohm
(B) volt
(C) watt
(D) ampere

51. In the Caribbean, the energy used in the production of electricity is derived mainly from

(A) waterfalls
(B) fossil fuels
(C) solar panels
(D) wind turbines

Item 52 refers to the following diagram of a spanner.



52. The spanner is an example of

(A) a lever
(B) a pulley
(C) an inclined plane
(D) a hydraulic press

53. Which of the following is NOT an alternative source of energy?

(A) Solar
(B) Wind
(C) Waves
(D) Charcoal

54. Which of the following is NOT a fossil fuel?

(A) Coal
(B) Biomass
(C) Crude oil
(D) Natural gas

55. Which of the following formulae is used to calculate the mechanical advantage (MA) of a machine?

(A) $MA = \frac{\text{Load}}{\text{Effort}}$

(B) $MA = \frac{\text{Effort}}{\text{Load}}$

(C) MA = Effort – Load

(D) MA = Effort × Load

56. The formula used to calculate the momentum of an object is

(A) $\frac{\text{Mass}}{\text{Velocity}}$

(B) $\frac{\text{Velocity}}{\text{Mass}}$

(C) Mass × Velocity

(D) Mass + Velocity

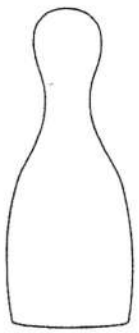
57. Which of the following devices does NOT use an electromagnet?

(A) Relay
(B) Light bulb
(C) Electric bell
(D) Electric motor

58. There are limits to the height and mass of material which can be transported by a vehicle. The reason for this is

(A) to ensure that the road is not damaged by the weight
(B) that the vehicle is too weak to carry the load
(C) that the vehicle would not be able to move fast enough
(D) to ensure that the vehicle's centre of gravity is not raised beyond safe limits

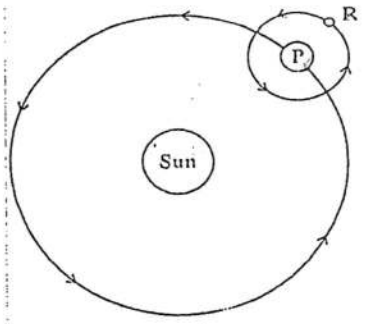
Item 59 refers to the following diagram.



59. Which of the following types of equilibrium is shown in the diagram?

(A) Stable
(B) Neutral
(C) Unstable
(D) Chemical

Item 60 refers to the following diagram which illustrates a body, P, that revolves around the sun and another body, R, that revolves around P.



60. Which of the following terms BEST describes P?

(A) Planet
(B) Galaxy
(C) Asteroid
(D) Satellite

END OF TEST