1. Which of the following features is used to classify a group of organisms as Class Insecta?

(A) Size
(B) Shape
(C) Colour
(D) Legs

2. Which of the following sampling methods is MOST suitable for estimating the density of mushrooms in a garden?

(A) Quadrat
(B) Line transect
(C) Belt transect
(D) Mark/Release/Recapture

3. Living organisms, such as plants, are affected by abiotic factors which determine where they become established. Which of the following lists some of these determining factors?

(A) Parasitism, commensalism, mutualism
(B) Sunlight availability, soil pH, minerals
(C) Sediment size, predation, disease
(D) Deforestation, slash and burn, shifting cultivation

4. Which of the following statements about recycling manufactured materials are true?

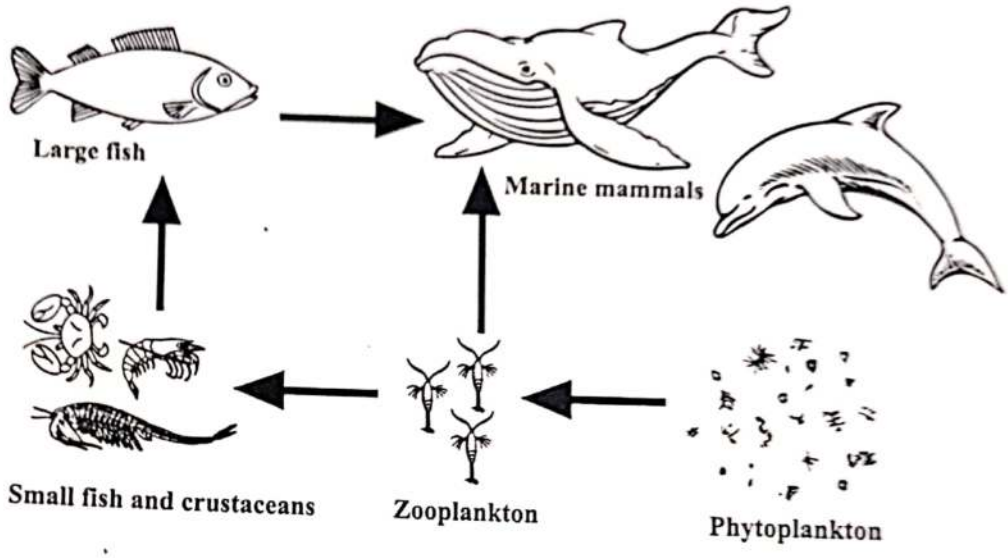
I. Less energy is used in the manufacturing of new products by using the raw materials from recycled products.
II. Some manufactured products can be recycled.
III. Recycling of some non-biodegradable materials prevents landfill sites from filling up too quickly and for a long time.

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

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Item 5 refers to the following diagram of a food web.



5. Trophic Level 1 is represented by

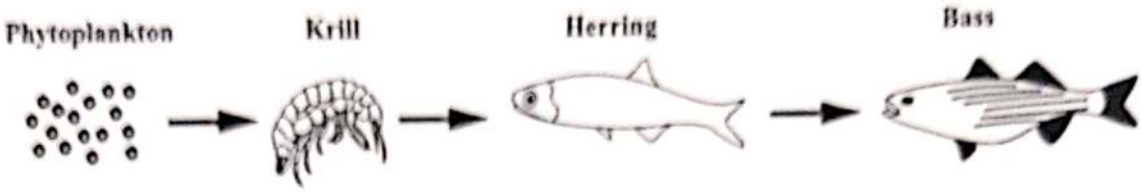
(A) small fish and crustaceans
(B) marine mammals
(C) phytoplankton
(D) zooplankton

6. A farmer notices pink mealy bugs in his garden. He is advised to introduce the ladybird beetle to control the mealy bugs. The type of relationship between the mealy bug and the ladybird beetle is described as

(A) commensalism
(B) predator–prey
(C) mutualism
(D) parasitism

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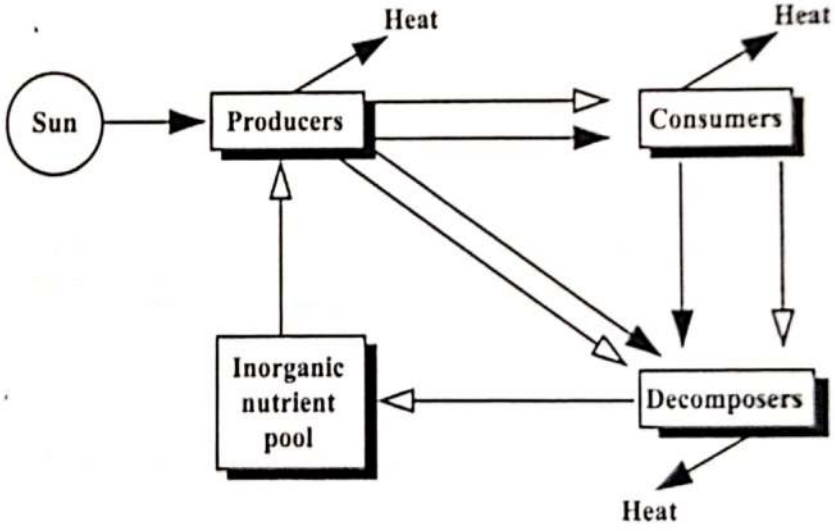
Item 7 refers to the following food chain.



7. The organisms which receive the MOST and LEAST energy respectively in this food chain are the

(A) herring and krill
(B) phytoplankton and bass
(C) bass and phytoplankton
(D) herring and phytoplankton

Item 8 refers to the following diagram which shows energy flow through an ecosystem.



8. The energy flow is NOT 100% efficient because energy is

(A) linear, moving from one organism to the next
(B) circular, moving in and out of organisms
(C) recycled from plants to the atmosphere
(D) lost through respiration and excretion

9. The GREATEST threat to the survival of coral reefs is

(A) decreased nitrogen levels
(B) increased dissolved oxygen
(C) decreased greenhouse gases
(D) increased ocean temperatures

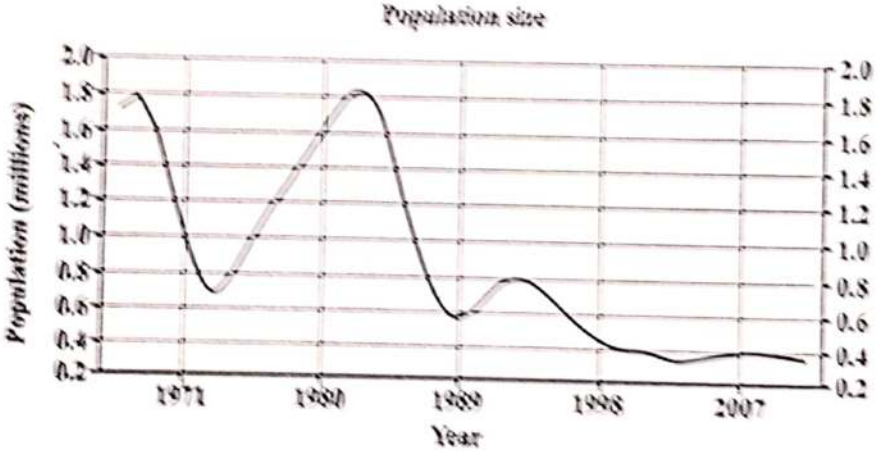
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10. Which of the following are effects of pollutants on coral reefs in the Caribbean?

I. Less reef fish
II. More branching corals
III. Increase in macroalgal and seagrass growth

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

Item 11 refers to the following diagram of human population size over a period of time.



11. Which of the following factors MOST likely account for the change in population size from 1980 to 1989?

I. Increase in contraceptive use
II. Epidemic of a deadly disease
III. Decrease in fatal crimes

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

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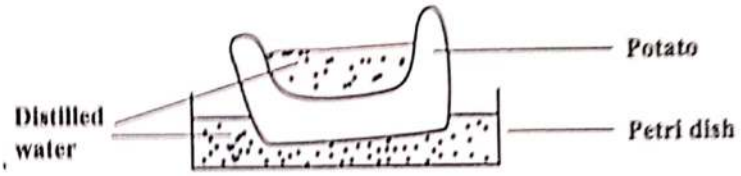
12. When compared to a cheek cell, a muscle cell contains more

(A) vacuoles
(B) ribosomes
(C) mitochondria
(D) chromosomes

13. Which of the following organelles is directly involved in photosynthesis?

(A) Nucleus
(B) Cytoplasm
(C) Chloroplast
(D) Mitochondrion

Item 14 refers to the following apparatus set up shown below.



14. What can be done to cause the level of solution in the petri dish to rise after 20 minutes?

(A) Add 5 g of salt to the distilled water in the potato only.
(B) Add 5 g of salt to the distilled water in the petri dish only.
(C) Add 5 g of salt to the distilled water in both the petri dish and the potato.
(D) Add 0 g of salt to the distilled water in both the petri dish and the potato.

15. A mature plant cell is different from a mature animal cell because the mature plant cell has

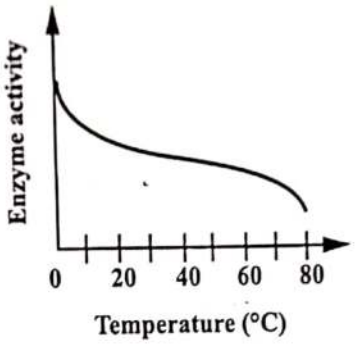
(A) mitochondria
(B) a cell membrane
(C) a large permanent vacuole
(D) a nucleus suspended in the cytoplasm

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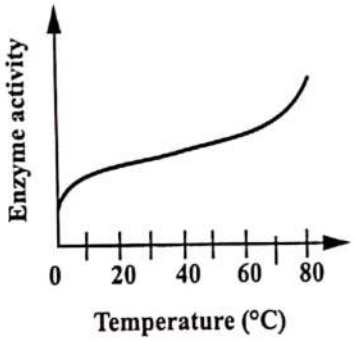
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16. Which of the following graphs shows the effect of temperature on an enzyme-controlled reaction?

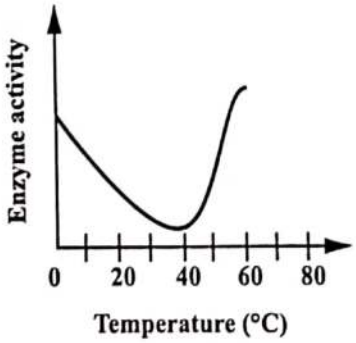
(A)



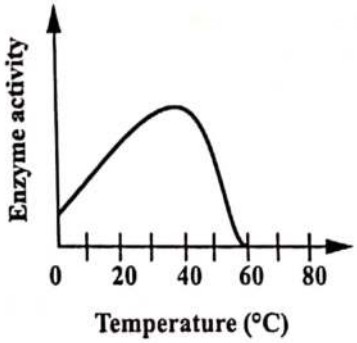
(B)



(C)



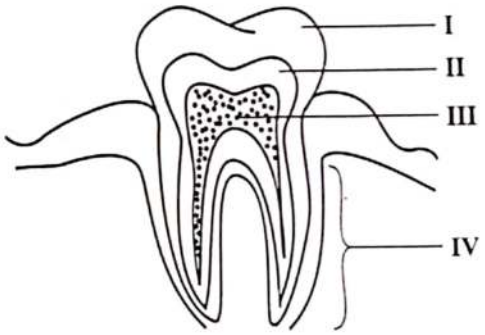
(D)



17. The role of an enzyme is BEST defined as a molecule which

(A) increases the rate of a chemical reaction
(B) decreases the rate of a chemical reaction
(C) increases the rate of a chemical reaction but remains unchanged at the end of the reaction
(D) decreases the rate of a chemical reaction but remains unchanged at the end of the reaction

Item 18 refers to the following longitudinal section of a tooth.

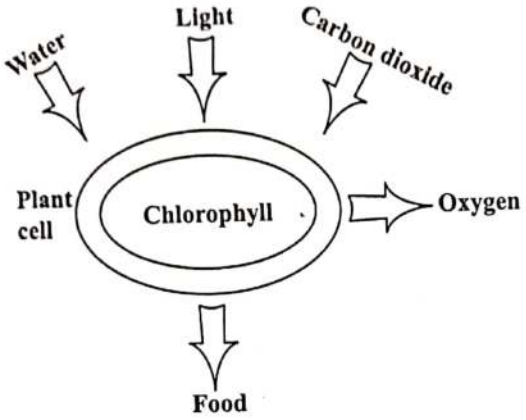


18. Which region of the tooth contains a large number of blood vessels and nerves?

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

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Item 19 refers to the following diagram which represents a metabolic process carried out in plants.



19. The food produced is

(A) fat
(B) glucose
(C) protein
(D) amino acid

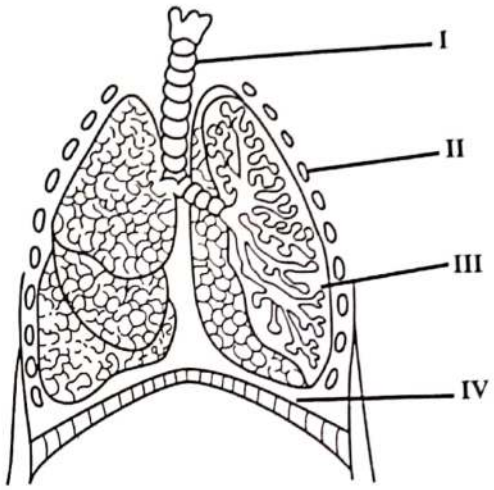
20. Autotrophic organisms derive their nutrition from

(A) water only
(B) complex organic substances only
(C) simple inorganic substances only
(D) both inorganic and organic substances

21. A 50-year old male is advised by his doctor to pay special attention to the amount of salt in his diet. He probably has a high chance of developing

(A) obesity
(B) diabetes
(C) hypertension
(D) sickle cell anaemia

Item 22 refers to the following diagram of the respiratory system.



22. Which of the labelled parts represents the rib?

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

Item 23 refers to the following equation which shows the oxidation of glucose in cells.

$$C_6H_{12}O_6 + O_2 \longrightarrow CO_2 + H_2O$$

Release of energy

23. The energy released from the process above is

(A) converted to ADP
(B) converted to ATP
(C) stored in a high energy bond in ADP
(D) stored in a high energy bond in ATP

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24. Which of the following features does NOT enhance a leaf's ability to absorb solar energy?

(A) Numerous chloroplasts in the palisade cells
(B) Presence of a vascular bundle
(C) Transparent cuticle
(D) Large surface area

25. Which of the following correctly matches the stored nutrients to their storage organs?

	Roots	Fruits	Liver
(A)	Proteins	Glucose	Fats
(B)	Carbohydrates	Sucrose	Glucose
(C)	Fats	Glucose	Glycogen
(D)	Carbohydrates	Sucrose	Glycogen

26. Which of the following correctly matches the gaseous exchange structures to the organism?

	Human	Fish	Plant
(A)	Alveoli	Gill filaments	Large leaves
(B)	Trachea	Mouth	Stems
(C)	Alveoli	Gill rakers	Young leaves
(D)	Trachea	Gill bars	Spongy mesophyll

27. The essential vitamin and mineral ions required for blood clotting in humans are

(A) C and K^+
(B) B and Na^+
(C) A and Mg^{2+}
(D) K and Ca^{2+}

28. Which of the following BEST identify some of the transport substances in animals?

I. Amino acids
II. Hormones
III. Sucrose

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

29. An *Amoeba* obtains all the oxygen it needs by diffusion via its cell membrane, while a human needs to have special respiratory surfaces for this purpose. The BEST reason for this difference is that

(A) a human requires a larger volume of oxygen
(B) oxygen cannot pass through the skin of a human
(C) an *Amoeba* does not require much oxygen
(D) a human's surface area to volume ratio is too small for diffusion to be effective

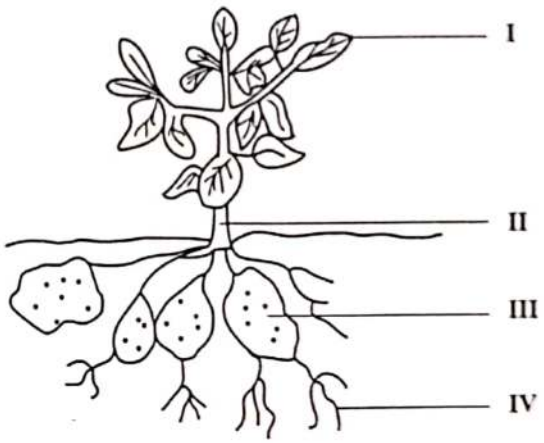
30. In the transport of solutes in the phloem, the source is defined as any area of the plant where

(A) water is loaded into the phloem
(B) water is taken out of the phloem
(C) sucrose is loaded into the phloem
(D) sucrose is taken out of the phloem

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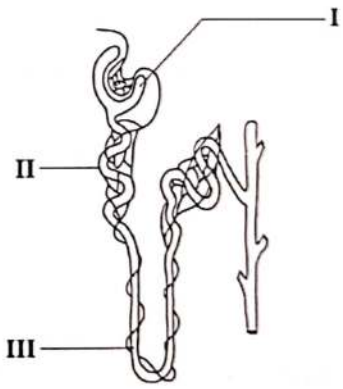
Item 31 refers to the following diagram of a potato plant.



31. Which part of the plant contains the MOST starch?

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

Item 32 refers to the following diagram of a mammalian kidney nephron.



32. Which of the following correctly identifies the functions of EACH of the labelled parts, I, II and III?

	I	II	III
(A)	Ultrafiltration	Water conservation	Selective reabsorption
(B)	Ultrafiltration	Selective reabsorption	Water conservation
(C)	Water conservation	Under the influence of ADH	Urine production
(D)	Selective reabsorption	Ultrafiltration	Under the influence of ADH

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33. Locomotion is important to animals for

I. avoiding predators
II. reproduction
III. assimilation

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

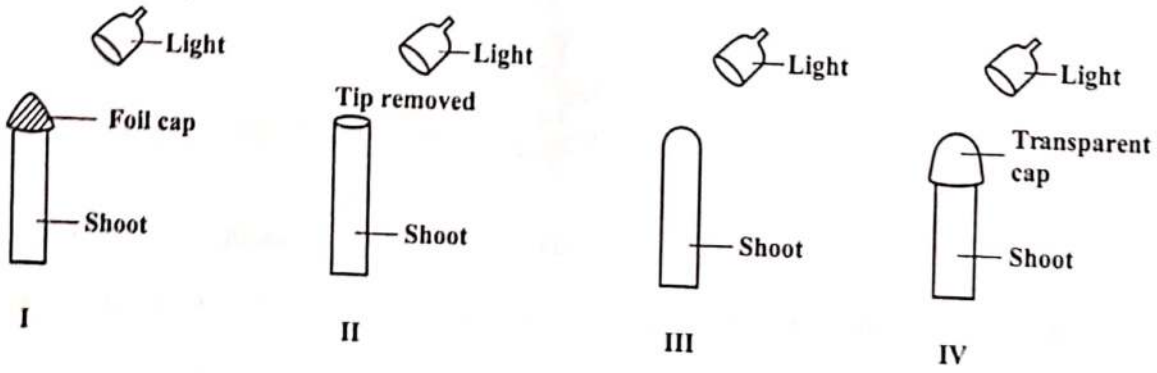
34. The correct order for an effective nervous response is

(A) Brain → Spinal Cord → Effector → Receptor
(B) Spinal Cord → Brain → Receptor → Effector
(C) Effector → Spinal Cord → Brain → Receptor
(D) Receptor → Spinal Cord → Brain → Effector

35. The BEST description of the role of excretion in living organisms is to

(A) produce urine
(B) produce faeces
(C) get rid of toxic waste
(D) get rid of excess water

Item 36 refers to the following diagrams illustrating the steps involved in an experiment.

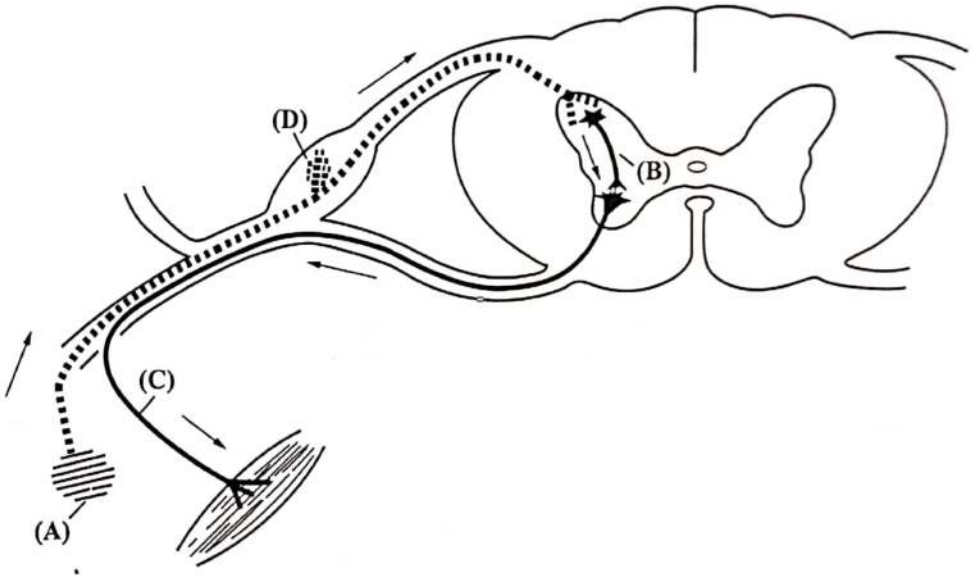


36. After a few days the TALLEST shoot would MOST likely be

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

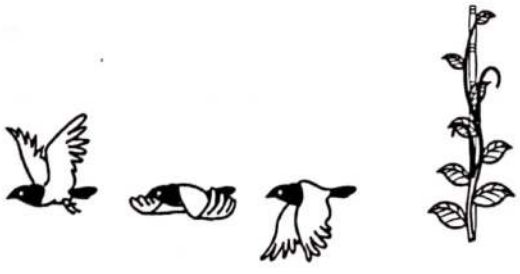
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Item 37 refers to the following diagram of a reflex arc.



37. Which labelled structure relays the impulse to an effector?

Item 38 refers to the following diagrams which show movement in plants and animals as seen in a bird and a vine.



Birds **Vine**

38. Which of the following statements about movement in a bird and movement in a vine is true?

(A) Both the bird and the vine move parts of their body
(B) The bird and the vine move because of a stimulus
(C) The bird moves its entire body while the plant does not move
(D) The entire body of the bird moves while a part of the plant moves

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39. Which of the following BEST describes the terms 'stimulus' and 'response'?

	Stimulus	**Response**
(A)	A deliberate provocation of an organism	The movement of an organism
(B)	An organism's exposure to sunlight	The growth of an organism away from light
(C)	A wave of excitement in an organism	Locomotion of an organism
(D)	A detectable change in an organism's environment	An organism's reaction to a stimulus

40. Which of the following factors does NOT contribute to glaucoma in the eye?

(A) Vitamin A deficiency
(B) Heredity
(C) Stroke
(D) Age

41. The function of the choroid layer in the eye is to

(A) focus most light rays
(B) prevent internal reflection
(C) maintain the shape of the eyeball
(D) control the amount of light entering the eye

42. The following statements describe the processes taking place within a seed during germination.

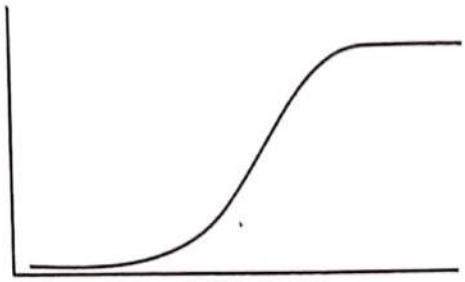
I. Embryo uses food to develop radicle and plumule.
II. Enzymes break down proteins into amino acids.
III. Soluble products move into the embryo.

Which of the following correctly identifies the sequence of events during the germination of the seed?

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

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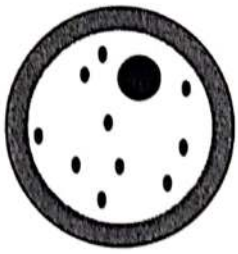
Item 43 refers to the following diagram which illustrates a measurement of growth in living organisms.



43. Which of the following labels would be INCORRECT on the *y*-axis?

(A) Mass
(B) Length
(C) Units of time
(D) Number of leaves

Item 44 refers to the following diagrams of two specialized cells.





44. Which of the following structures is common to both cells?

(A) Cilium
(B) Nucleus
(C) Flagellum
(D) Acrosome

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45. Which row in the following table CORRECTLY states the cause, treatment, control and prevention of the disease AIDS?

	Causative Agent	Treatment	Control	Prevention
(A)	RNA virus	Anti-retrovirals, e.g. AZT	Monogamy	Abstinence
(B)	Bacterium	Antibiotics	Monogamy	Abstinence
(C)	DNA virus	Antigens	Vaccination	Public education
(D)	Bacterium	Penicillin	Vaccination	Abstinence

46. Which of the following forms of birth control is likely to be MOST effective?

(A) Condom
(B) Diaphragm
(C) Tubal ligation
(D) Birth control pill

47. Which of the following is the correct sequence for seed formation after fertilization?

(A) Ovule → Zygote → Embryo → Seed
(B) Ovule → Embryo → Seed → Zygote
(C) Embryo → Ovule → Zygote → Seed
(D) Embryo → Zygote → Ovule → Seed

48. A vector is defined as an organism that

(A) bites humans
(B) causes diseases
(C) lives on other organisms
(D) transmits disease carrying organisms

49. Production of new organisms from one parent only is known as

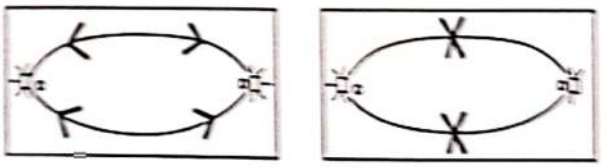
(A) asexual reproduction
(B) sexual reproduction
(C) mitosis
(D) meiosis

50. One example of a sex-linked disease is

(A) cancer
(B) hypertension
(C) colour blindness
(D) Down syndrome

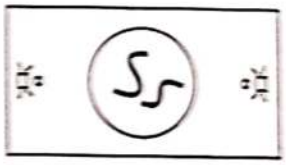
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Item 51 refers to the following diagrams which show the stages of mitosis.

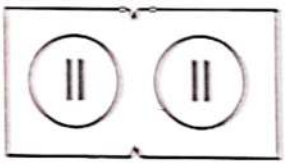


I

II



III



IV

51. The correct order of the stages is

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

52. On a certain Caribbean island where sugar cane is grown, a fungus is accidentally introduced into the island and destroys the entire crop of sugar cane. Which of the following BEST describes this occurence?

(A) The plants were old and therefore more susceptible to the fungus.
(B) The plants were not of a hardy enough variety to withstand the fungus.
(C) The plants were planted too close together so the fungus spread easily.
(D) There was no genetic variation among the plants so none could survive the attack.

53. Which of the following is NOT a characteristic of meiosis?

(A) Maintenance of the diploid number
(B) Genetic recombination of alleles
(C) Crossing over of chromosomes
(D) Random assortment of genes

54. Albinism is caused by a recessive allele. Two normal parents produce an albino child. This is because

(A) both parents were homozygous recessive
(B) both parents were heterozygous for the gene
(C) one parent was homozygous dominant for the trait and the other heterozygous
(D) one parent was homozygous dominant for the trait and the other homozygous recessive

55. Variation in a population is due to

I. mutation
II. crossing over
III. asexual reproduction

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

56. Two goats, heterozygous for fast growth rate, are crossed. What percentage of the ENTIRE F1 population would be expected to possess homozygous alleles?

(A) 25%
(B) 75%
(C) 50%
(D) 100%

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57. A man with Blood Group A married a woman with Blood Group B. They produced two children with Blood Group AB. The alleles A and B are described as being

(A) homozygous
(B) codominant
(C) recessive
(D) dominant

58. Which of the following is true about natural and artificial selection?

	Natural Selection	Artificial Selection
(A)	Occurs in domestic populations	Occurs in natural populations
(B)	Involves genetic modification	Largely controlled by the environment
(C)	Produces organisms well suited to the environment	Produces very different organisms from natural populations
(D)	Faster process	Slower process

59. A group of closely related organisms that are able to interbreed and produce fertile offspring is called a

(A) niche
(B) species
(C) population
(D) community

60. Which of the following terms refers to visible characteristics of living things?

(A) Gene
(B) Genotype
(C) Phenotype
(D) Chromosome

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.

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