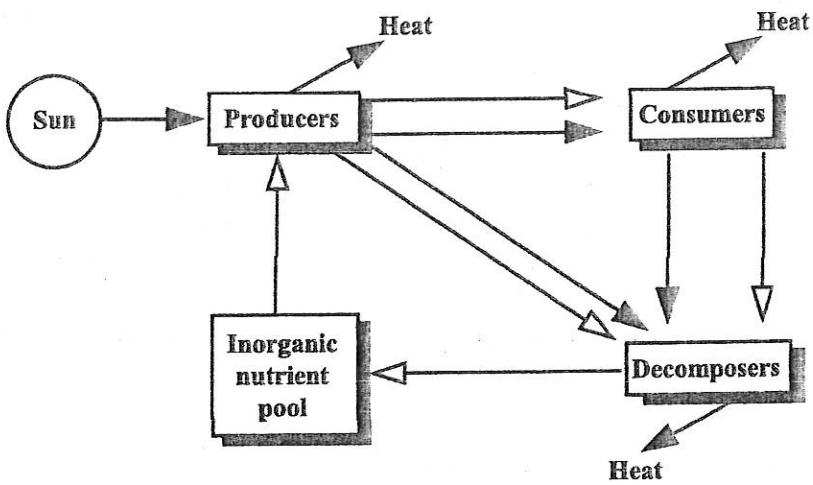
1. Which of the following characteristics is used to distinguish insects from other Arthropods?

(A) Number of legs
(B) Hairiness
(C) Colour
(D) Shape

2. Living organisms, such as plants, are affected by ABIOTIC factors which determine where they become established. Which of the following options describes some of these determining factors?

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

Item 3 refers to the following diagram of energy transfer from the sun.



3. *Energy flow through ecosystems is not* 100% efficient. This is so because energy is

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

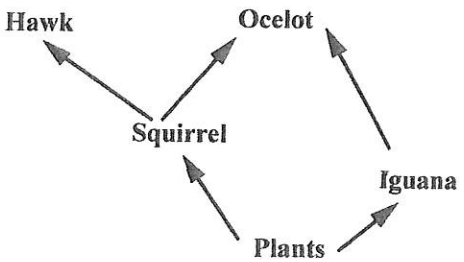
4. On which trophic level can herbivores MOST likely be found?

(A) First
(B) Second
(C) Third
(D) Fourth

5. Commensalism is illustrated by the relationship between a

(A) dog and a flea
(B) hen and a chick
(C) cow and an egret
(D) man and a mosquito

Item 6 refers to the following food web.



6. How many complete food chains are there in the food web shown above?

(A) 1
(B) 2
(C) 3
(D) 4

7. Which of the following is the MAIN advantage of recycling?

(A) Recycled products are more durable.
(B) Recycling saves on raw materials.
(C) Recycled products are cheaper.
(D) Recycling creates jobs.

8. 50 g of a fresh sample of soil is repeatedly heated at 110 °C and cooled in a desiccator. The final constant weight of the soil is 35 g. The soil component eliminated by this procedure is MOST likely

(A) air
(B) water
(C) humus
(D) mineral

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

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

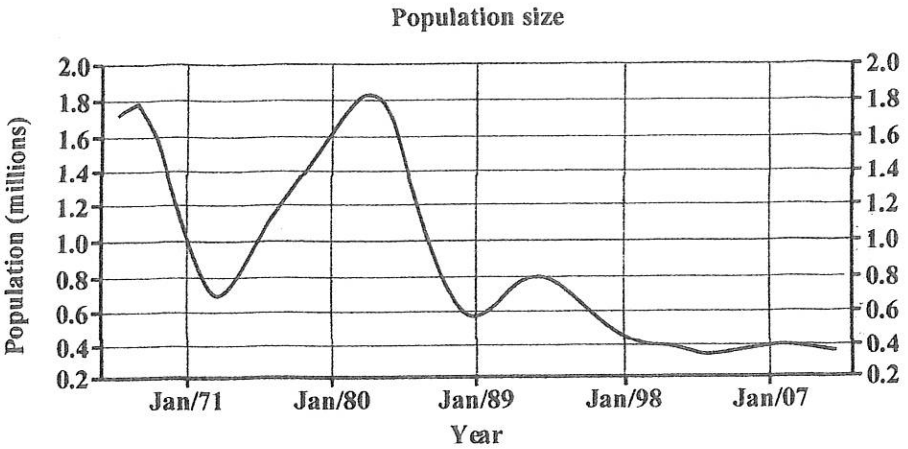
(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

10. Which of the following practices may be used in the conservation or restoration of an ecosystem?

I. Restricting hunting seasons
II. Planting of mangroves along the shoreline
III. Quarrying to remove limestone

(A) I only
(B) II only
(C) I and II 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 January 1980 to January 1989?

I. Increase in contraceptive use
II. Influenza 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

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

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

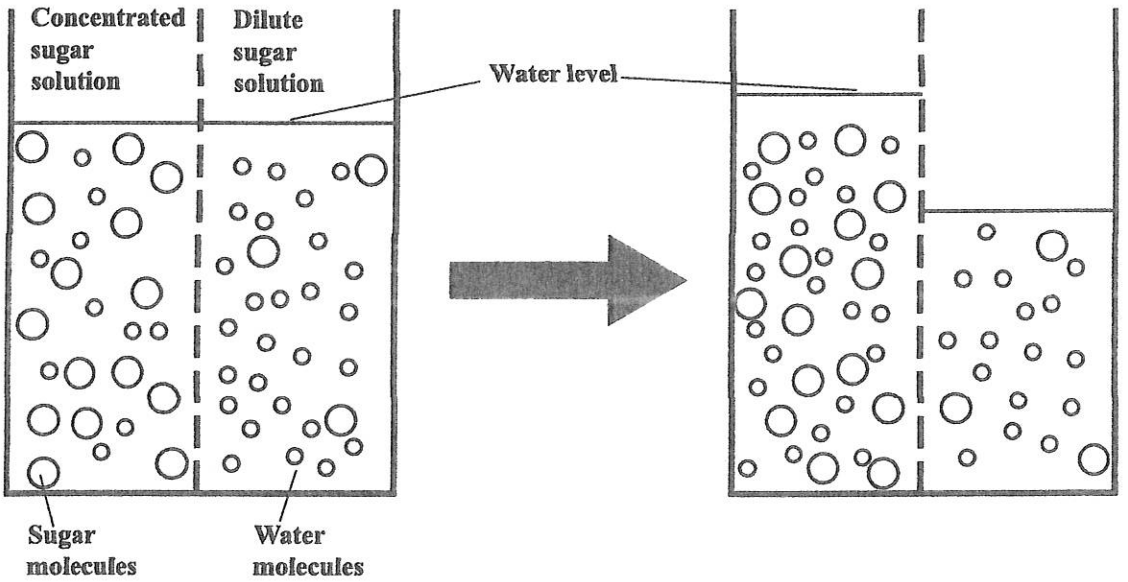
13. Which of the following structures are found in BOTH the generalized plant cell and the animal cell?

(A) Cell wall, vacuole and cytoplasm
(B) Cell wall, cell membrane and nucleus
(C) Cell membrane, vacuole and chloroplast
(D) Cell membrane, mitochondrion and vacuole

14. The role of respiration is the

(A) release of energy
(B) absorption of oxygen
(C) liberation of carbon dioxide
(D) breakdown of carbohydrates

Item 15 refers to the following diagram which shows a process by which substances are moved into and out of cells.



15. Which of the following correctly identifies and describes the process occurring above?

	Process	Description
(A)	Diffusion	Water moving from concentrated to dilute solution
(B)	Osmosis	Water moving from dilute to concentrated solution
(C)	Diffusion	Sugar moving from dilute to concentrated solution
(D)	Osmosis	Sugar moving from concentrated to dilute solution

16. Which of the following BEST describes the nucleus of a cell?

(A) It is not permeable.
(B) It contains starch grains.
(C) It contains mitochondria.
(D) It stores genetic information in the form of DNA.

17. Which of the following substances is NOT necessary for photosynthesis to take place?

(A) Water
(B) Energy
(C) Oxygen
(D) Chlorophyll

18. After absorption by the ileum, excess glucose is immediately converted to

(A) energy during cellular respiration
(B) glycogen by the liver and muscles
(C) fat in the liver and muscles
(D) fat by the liver and stored under the skin

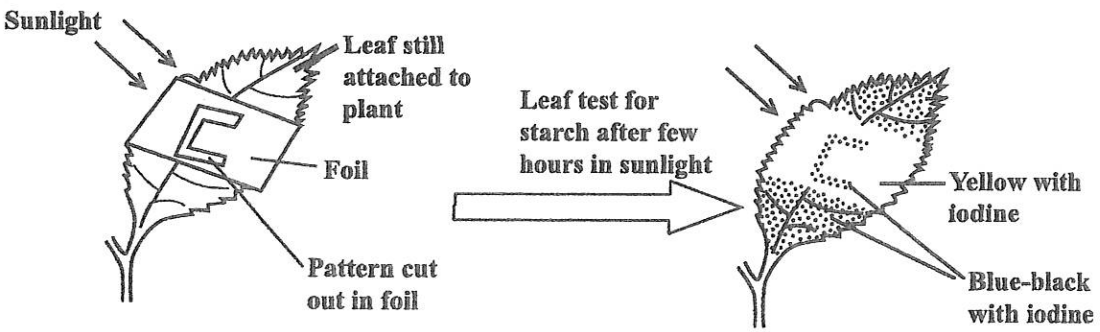
19. Which of the following is optimum for the action of salivary amylase?

	Temperature (°C)	pH	Amount of Maltose Produced (µg)
(A)	20–30	1–2	12
(B)	30–40	7–8	73
(C)	30–40	9–10	64
(D)	40–50	7–8	32

20. An athlete suffered muscle cramps following his race. The muscle cramps are MOST likely caused by an accumulation of

(A) urea
(B) oxygen
(C) lactic acid
(D) excess glucose

Item 21 refers to the following diagram which illustrates the result of an investigation on a well-watered, de-starched plant which was left for a few hours in sunlight.



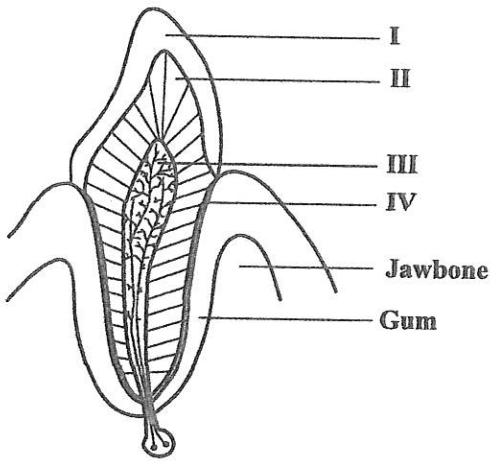
21. A likely explanation of this result is that the

(A) covered part of the leaf died
(B) soil around the plant dried out
(C) foil prevented light from entering the leaf
(D) foil prevented carbon dioxide from entering the leaf

22. Which feature correctly distinguishes a phagocyte from a lymphocyte?

	Feature	Phagocyte	Lymphocyte
(A)	Engulfs pathogens	Yes	No
(B)	Produces antibodies	Yes	No
(C)	Has a lobed nucleus	No	Yes
(D)	Formed in bone marrow	Yes	Yes

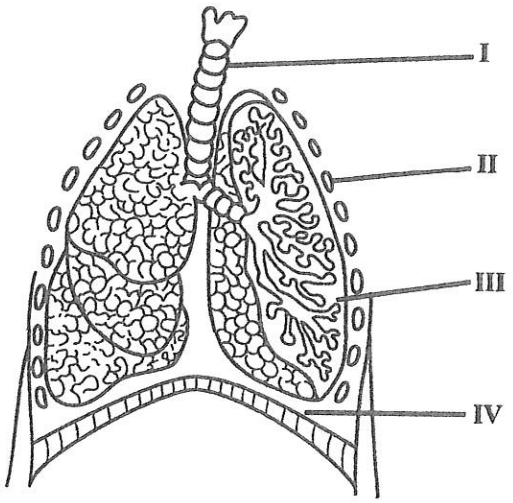
Item 23 refers to the following diagram of a section through an incisor tooth.



23. The region of the tooth sensitive to temperature is labelled

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

Item 24 refers to the following diagram of the respiratory system.



24. Which of the labelled parts represents the rib?

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

25. Which of the following activities is NOT correct for the process of inhalation?

(A) Ribs move down and in.
(B) Air moves into lungs.
(C) Diaphragm muscles flatten.
(D) Volume of thoracic cavity increases.

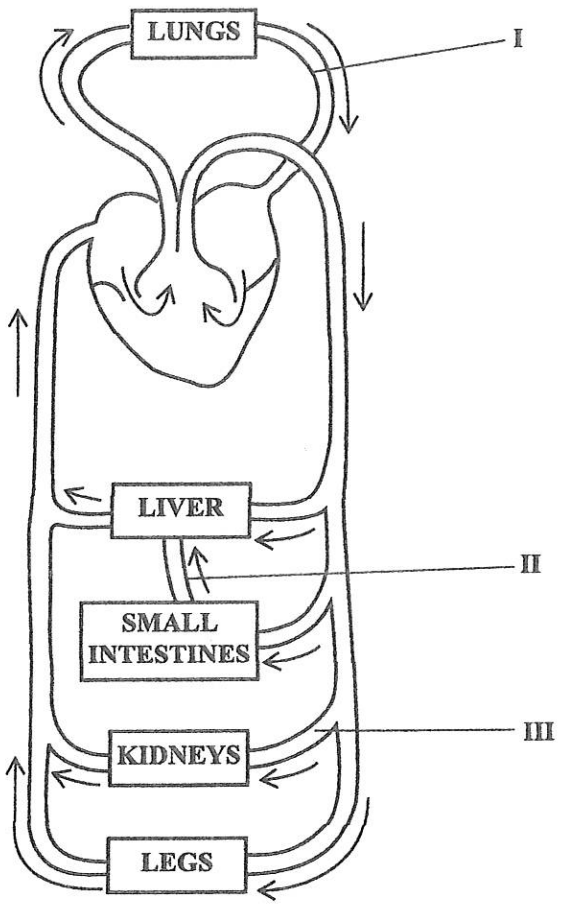
26. Which of the following options BEST identifies some of the transport substances in animals?

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

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Item 27 refers to the following diagram.



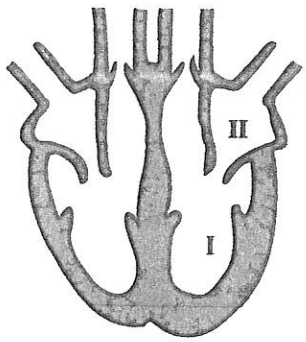
27. Which of the following correctly identifies the vessels labelled I, II and III in the diagram above?

	I	II	III
(A)	Pulmonary artery	Hepatic artery	Mesenteric vein
(B)	*Pulmonary vein*	*Hepatic portal vein*	Renal artery
(C)	Aorta	Renal artery	Pulmonary artery
(D)	Pulmonary artery	Hepatic portal vein	Renal vein

28. A person whose kidneys have failed must undergo a process by which excretory materials are removed from the blood regularly. This is because excretory materials

(A) raise blood pressure
(B) make the blood dilute
(C) are not gotten rid of by any other means
(D) would otherwise accumulate and poison the person

Item 29 refers to the following diagram of a mammalian heart.



29. In a patient with a certain defective heart condition, it was found that blood flowed from Section I to Section II in the diagram above. This was MOST likely due to malfunction of the

(A) left atrium
(B) left ventricle
(C) semi-lunar valve
(D) bicuspid valve

30. The following statements describe some of the stages of the clotting of blood.

I. Platelets are activated.
II. Thrombin converts fibrinogen to fibrin.
III. Prothrombin converted to thrombin.
IV. A clot is formed.

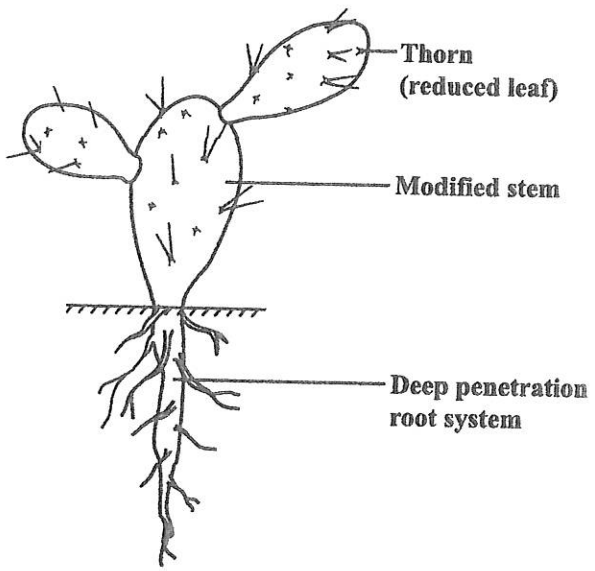
Which of the following correctly identifies the sequence of events in the process of clotting?

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

31. Why is it difficult to develop a vaccine for the common cold?

(A) The antibodies for the common cold are difficult to produce.
(B) The antigens on the common cold virus remain the same.
(C) The antigens on the common cold virus change frequently.
(D) Human beings cannot produce antibodies for the common cold.

Item 32 refers to the following diagram of a cactus.



32. Which of the following describes the function of the thorns?

(A) Aid in dispersal
(B) Increase surface area
(C) Reduce transpiration
(D) Ward off carnivores

33. Which of the following rows correctly shows the metabolic substances that are excreted by plants and animals?

	Plants	Animals
(A)	Urea	Carbon dioxide
(B)	Tannin	Calcium oxalate
(C)	Tannin	Oxygen
(D)	Calcium oxalate	Water

34. Which of the following is LEAST likely to be an example of a growth movement in a plant?

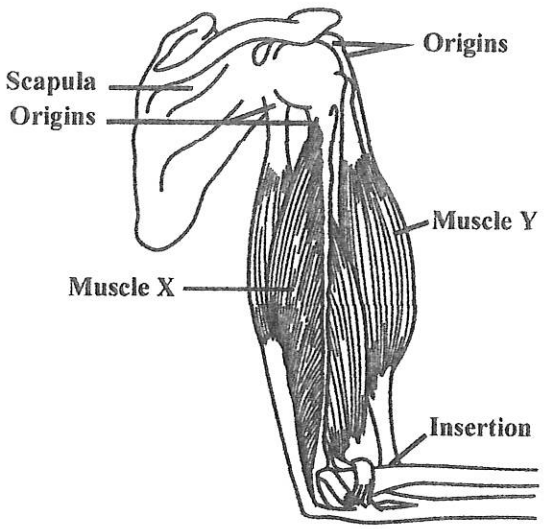
(A) The closing of the leaves of a sensitive plant
(B) The downward movement of the roots in the soil
(C) The crawling movement of runners like grasses
(D) The upward movement of a vine on a rod

35. Which of the following statements about the skeletal system is NOT correct?

(A) It protects delicate organs such as the heart and lungs.
(B) It is made up of hard non-living tissues.
(C) It produces red and white blood cells.
(D) It gives the body its shape.

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Item 36 refers to the following diagram which shows flexing of the arm.



36. Which of the following occurs when the arm is flexed?

	Muscle X	Muscle Y
(A)	Contracts	Relaxes
(B)	Contracts	Contracts
(C)	Relaxes	Relaxes
(D)	Relaxes	Contracts

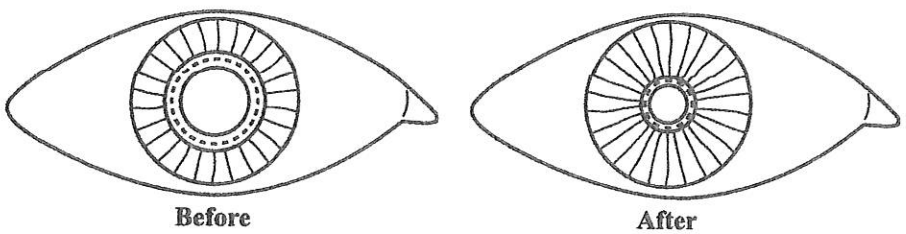
37. A detectable change in the internal or external environment of an organism is called

(A) a stimulus
(B) a response
(C) a receptor
(D) an effector

38. A girl smells a hamburger that is being cooked by her mother and she salivates. Which of the following is the effector which brings about her response?

(A) Cells in the nose
(B) Salivary glands
(C) Smell of food
(D) Secretion of saliva

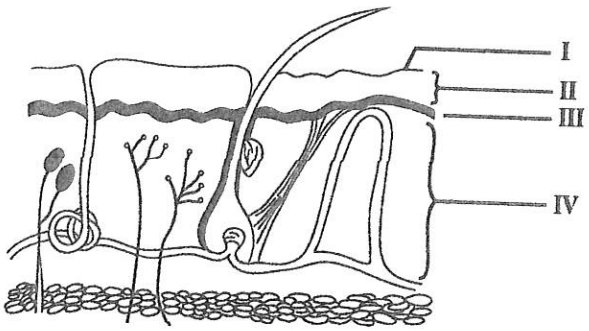
Item 39 refers to the following diagram showing an eye's response to looking at an object.



39. The response is MOST likely brought about by

(A) an increase in the light intensity
(B) a decrease in the light intensity
(C) the object being brought nearer
(D) the object being moved further away

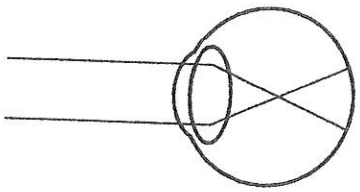
Item 40 refers to the following diagram of the skin.



40. The region which acts in a similar manner to SPF (sun protection factor) creams is

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

Item 41 refers to the following diagram of an eye which shows nearsightedness.



41. Which of the following shows how the defect can be corrected?

	Lens	Bending of Light Rays Before Entering the Eye
(A)	Diverging	Outwards
(B)	Diverging	Inwards
(C)	Converging	Outwards
(D)	Converging	Inwards

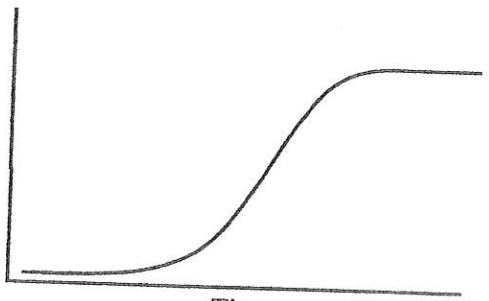
42. The following statements describe the processes taking place within a seed during germination.

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

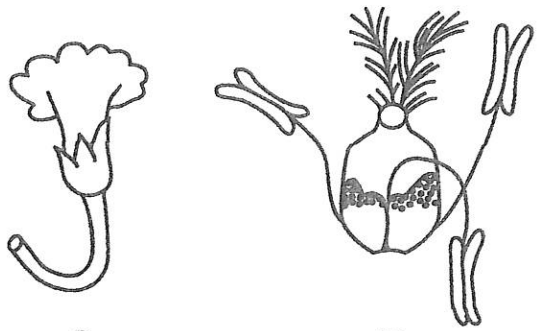
Item 43 refers to the following diagram which illustrates a measurement of growth in living organisms.



43. Which of the following 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 flowers from two different types of plants.

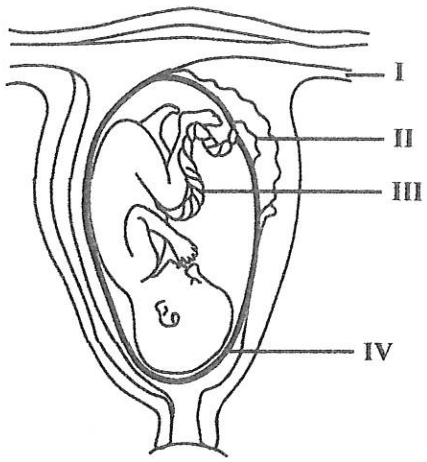


I II

44. Which of the following statements is TRUE for both flowers?

(A) Both are wind pollinated.
(B) Petals are absent from both I and II.
(C) Both are pollinated by a hummingbird.
(D) I is pollinated by a hummingbird; II is pollinated by the wind.

Items 45–46 refer to the following diagram.



45. The amnion is labelled

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

46. The placenta is labelled

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

47. Which of the following is NOT a consequence of a plant or human disease?

(A) Decrease in food prices
(B) Loss of productivity
(C) Higher absenteeism from school
(D) Larger part of national budget used to buy medications

48. One method of controlling the population of mosquitoes is by getting rid of all stagnant water. Which stages of the life cycle does this method control?

(A) Egg, larva, adult
(B) Egg, larva, pupa
(C) Larva, pupa, adult
(D) Egg, pupa, adult

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

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

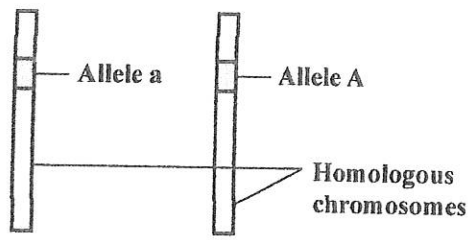
50. Which of the following forms of birth control is likely to be the MOST effective?

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

51. Two alleles of a gene are situated at

(A) the same locus on a homologous pair of chromosomes
(B) different loci on a homologous pair of chromosomes
(C) the same locus on a different homologous pair of chromosomes
(D) different loci on a different homologous pair of chromosomes

Item 52 refers to the following diagram which shows a section of a pair of homologous chromosomes that codes for hair colour.



52. Which of the following describes the genotype shown above?

(A) Homozygous
(B) Heterozygous
(C) Homozygous recessive
(D) Homozygous dominant

53. Which of the following statements about meiosis is NOT true?

(A) It allows for genetic variation.
(B) It results in the production of gametes.
(C) It causes haploid cells to form from diploid cells.
(D) It doubles the number of chromosomes in gametes.

54. Two goats, heterozygous for fast growth rate, are crossbred. The percentage of the F1 population which possesses homozygous alleles is

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

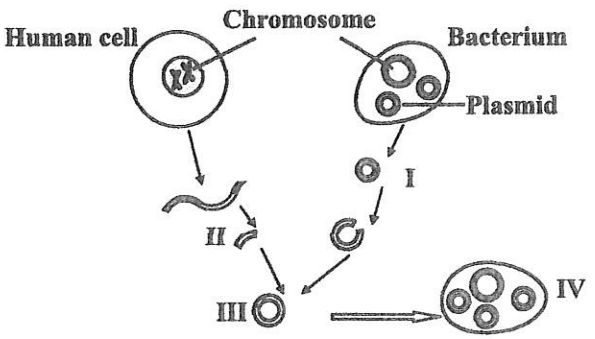
55. Albinism is caused by a single recessive allele. Two normal parents have an albino child. This is because

(A) both parents were heterozygous for the gene
(B) both parents were homozygous recessive 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

56. Which of the following options correctly describes DNA, chromosome, gene and allele?

	DNA	Chromosome	Gene	Allele
(A)	Deoxyribonucliec acid	DNA + histamine	Unit that codes for a specific protein	An alternate form of a gene
(B)	Unit that codes for a specific protein	An alternate form of a gene	DNA + protein	Histones
(C)	Nucleic acid that has all genetic information	DNA + histones	The smallest unit of inheritance	An alternate form of a gene
(D)	Nucleic acid that has all genetic information	The smallest unit of inheritance	Unit that codes for a specific protein	DNA + protein

Item 57 refers to the following diagram which shows the production of insulin by genetic engineering.



57. In which of the stages shown in the diagram can insulin be produced by the bacterium?

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

58. A species is BEST defined as a group of organisms that

(A) cannot interbreed
(B) are physically similar
(C) can interbreed and produce many offspring
(D) can interbreed and produce fertile offspring

59. Which of the following is TRUE about natural selection 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 great biological *diversity*	*Produces very different organisms from* natural populations
(D)	Faster process	Slower process

60. Which of the following statements about genetic engineering and natural selection is CORRECT?

(A) Genetic engineering can change the phenotype of an organism faster than natural selection.
(B) Genetic engineering does not change the phenotype whereas natural selection does.
(C) *Genetic engineering does not change the genotype whereas natural selection does.*
(D) Both genetic engineering and natural selection do not change the genotype.

END OF TEST

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