Items 1–2 refer to the following food chain which shows the feeding relationships in a freshwater habitat.

Microscopic → Mosquito → Small → Large
Alga Larva Fish Fish

1. The organism to which the LEAST amount of energy is available is the

(A) large fish
(B) small fish
(C) mosquito larva
(D) microscopic alga

2. The GREATEST number of individuals in the food chain would be the

(A) large fish
(B) small fish
(C) mosquito larva
(D) microscopic alga

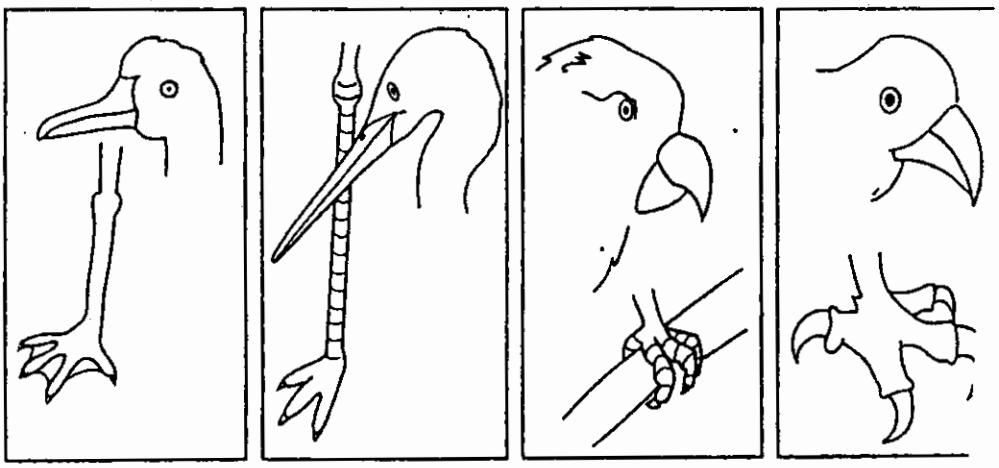
3. Some fungi are said to be decomposers because they

(A) have no chlorophyll and cannot make their own food
(B) depend on dead organisms as a source of nutrients
(C) break down the bodies of dead organisms to simple substances
(D) use plant and animal materials to make chemicals

4. Bacteria play an important role in the cycling of nitrogen. Which of the following organisms is NOT a part of this cycle?

(A) Nitrobacter
(B) Nitrosomonas
(C) Rhizobium
(D) Streptococcus

Item 5 refers to the following diagrams showing beaks and feet of four birds found in the Caribbean.



I II III IV

5. Which bird is BEST adapted to feeding on fish in a swamp?

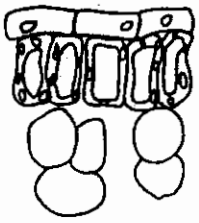
(A) I
(B) II
(C) III
(D) IV

Item 6 refers to the following diagrams of different structures taken from plants and animals.

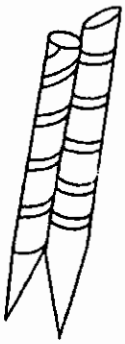
I.

II.

III.



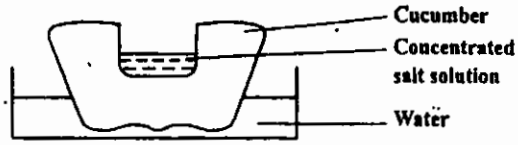
IV.



6. Which of the above structures is NOT a tissue?

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

Items 7–8 refer to the diagram below.



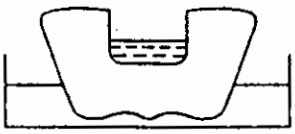
7. The process being investigated is

(A) diffusion
(B) osmosis
(C) translocation
(D) active transport

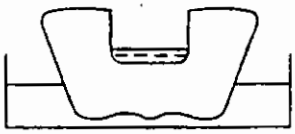
8. Which diagram BEST illustrates the levels of the liquids if the apparatus is left undisturbed for one hour?

(A)

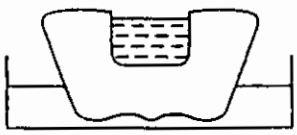
(B)



(C)



(D)



9. Which of the following pairs of organisms possesses the characteristics for making carbohydrates from inorganic materials?

(A) Algae and flowering plants
(B) Fungi and flowering plants
(C) Bacteria and fungi
(D) Viruses and algae

Item 10 refers to the following diagram which shows organisms in a garden.

10. The organisms which show heterotrophic and autotrophic nutrition respectively are

	Heterotrophic	Autotrophic
(A)	grass	mushroom
(B)	tree trunk	grasshopper
(C)	grasshopper	grass
(D)	grass	tree trunk

11. The process which moves food through the alimentary canal is called

(A) peristalsis
(B) digestion
(C) mastication
(D) swallowing

12. Absorption of amino acids takes place in the

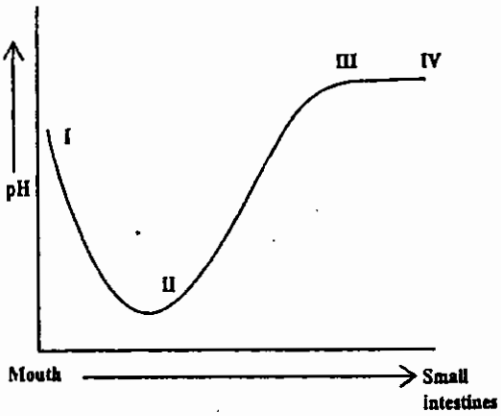
(A) duodenum
(B) stomach
(C) ileum
(D) colon

13. Which of the following statements are true about the suitability of leaves for photosynthesis?

I. They are broad and flat and offer a large surface area for absorption of sunlight and carbon dioxide.
II. There are many pores on the lower surface of the leaf to permit rapid exchange of gases.
III. There is a branching network of veins to provide a ready supply of water.
IV. There are often more chloroplasts in the upper cells of the leaf than the lower cells which receive less sunlight.

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

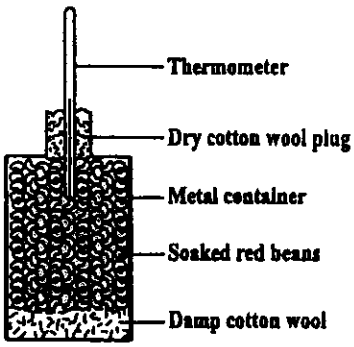
Item 14 refers to the following graph which shows levels of the pH in the alimentary canal.



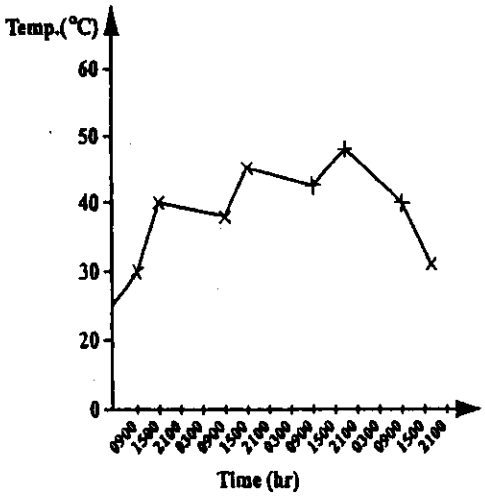
14. Which point in the graph MOST likely indicates the presence of hydrochloric acid in the alimentary canal?

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

Item 15 refers to the following apparatus used in an investigation.



The initial temperature of the beans was noted and readings were taken at regular intervals twice daily for four days. The data obtained were used to plot the graph below.



15. The increase in temperature in the metal container is BEST explained by the fact that the seeds are

(A) numerous
(B) taking in water
(C) placed close together
(D) using their food stores

16. The rate at which respiration occurs in a mammal is indicated by the rate of

(A) sweat production
(B) urine excretion
(C) oxygen elimination
(D) carbon dioxide elimination

17. Which of the following events does NOT occur during inspiration?

(A) External intercostal muscles relax.
(B) Internal intercostal muscles relax.
(C) Diaphragm muscles contract.
(D) Volume inside lungs and thorax increases.

18. Which of the following statements about cigarette smoking are MOST likely true?

I. Results in persistent coughing and shortness of breath.
II. There is destruction of the alveolar walls.
III. Blood pressure is lowered.

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

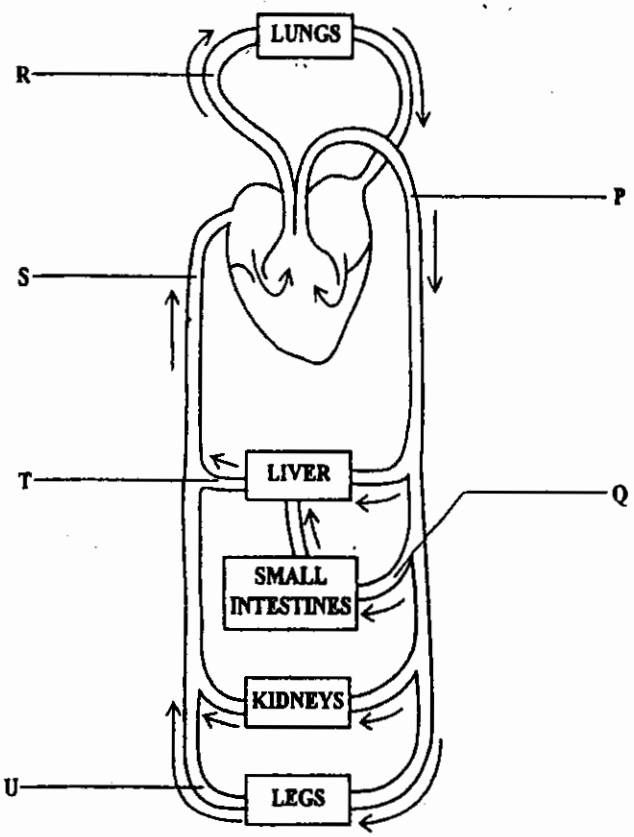
19. Large organisms cannot depend solely on diffusion for the uptake and transport of gases. This is because as organisms get larger the

(A) surface area to volume ratio increases
(B) surface area to volume ratio decreases
(C) surface area and the volume both increase
(D) surface area and the volume both decrease

20. Which of the following are involved in the formation of blood clots?

(A) Platelets
(B) Antibodies
(C) Lymphocytes
(D) Phagocytes

Item 21 refers to the following diagram which represents part of the human circulatory system.



21. Blood vessels which contain valves along their length are

(A) P and T
(B) R and T
(C) S and Q
(D) S and U

---

22. Transpiration is important to plants because it

(A) keeps the plants cool
(B) facilitates the movement of manufactured food through the xylem
(C) assists manufactured food to move through the phloem
(D) releases excess water in the form of water vapour

23. Which of the following statements about translocation is true?

(A) It does not require energy.
(B) It occurs in sieve tubes but not in xylem vessels.
(C) Carbohydrates and proteins are transported by this process.
(D) It involves the movement of inorganic substances.

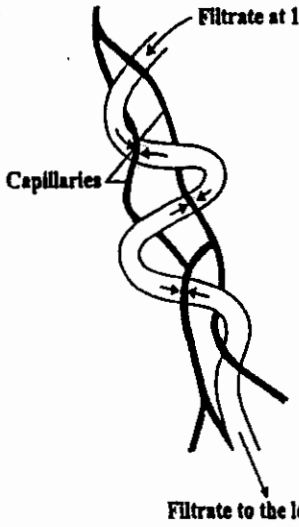
24. The body rids itself of nitrogenous waste products through the process of

(A) excretion
(B) diffusion
(C) evaporation
(D) osmoregulation

25. Dyes in 'heartwood' and tannins in the bark of trees are MOST likely products of

(A) translocation
(B) excretion
(C) respiration
(D) photosynthesis

Item 26 refers to the following diagram of part of the proximal convoluted tubule of a person suffering from diabetes mellitus.



26. The filtrate leaving the tubule MOST likely contains

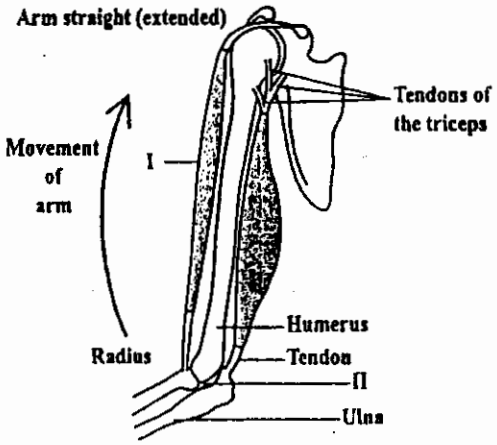
(A) no glucose
(B) some glucose
(C) less water than the filtrate at 1
(D) more water than the filtrate at 1

27. Competitive swimmers drink cool water at regular intervals during training to

I. reduce the heat lost from their bodies
II. replace water lost by sweating
III. help their body temperature to remain steady

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

Items 28–29 refer to the following diagram which shows the bones and muscles of the arm.



28. The muscle at I which is responsible for movement of the limb is

(A) a smooth muscle
(B) an extensor muscle
(C) a flexor muscle
(D) a skeletal muscle

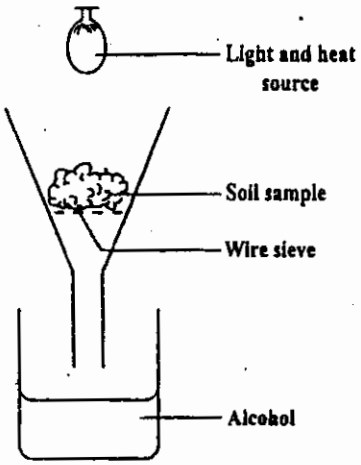
29. Which of the following types of joints is shown at II?

(A) Hinge
(B) Gliding
(C) Synovial
(D) Ball and socket

30. Which of the following vertebrae has a centrum that is developed to support the weight of the body?

(A) Sacral
(B) Lumbar
(C) Thoracic
(D) Cervical

Items 31–32 refer to the following diagram of a Tullgren funnel which is used for collecting small soil organisms.



31. The purpose of the light bulb is to

(A) enable the investigator to see the small organisms
(B) provide warmth for the soil organisms
(C) drive organisms to the base of the funnel
(D) keep the alcohol at a constant temperature

32. Which of the following explain why the apparatus works well?

I. Soil organisms show a positive response to gravity.
II. Soil organisms show a negative response to light.
III. Soil organisms are killed by alcohol.
IV. Soil organisms move away from dry areas.

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

Item 33 refers to the events that occur when a student reacts to touching a hot object by withdrawing her hand.

Hot object → Pain → Effector → Response

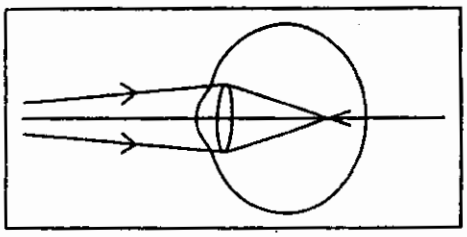
33. The receptor is the

(A) hot object touched
(B) heat from the hot object
(C) sensory endings in the skin
(D) muscles that contract

34. Which area of the brain controls heartbeat?

(A) Cerebrum
(B) Cerebellum
(C) Hypothalamus
(D) Medulla oblongata

Item 35 refers to the following diagram which shows where light will focus for an individual with an elongated eyeball.



35. Which of the following types of lens should be used to correct this defect?

(A) Concave
(B) Convex
(C) Cylindrical
(D) Bifocal

36. Which of the following functions of the skin is an example of homeostasis?

(A) Storage of fats
(B) Release of sweat
(C) Secretion of sebum
(D) Maintenance of body temperature

37. An athlete who has not eaten a meal in the past four hours is about to run a race. Which of the following hormones will be secreted in his body?

(A) Insulin only
(B) Adrenaline only
(C) Insulin and adrenaline
(D) Glucagon and adrenaline

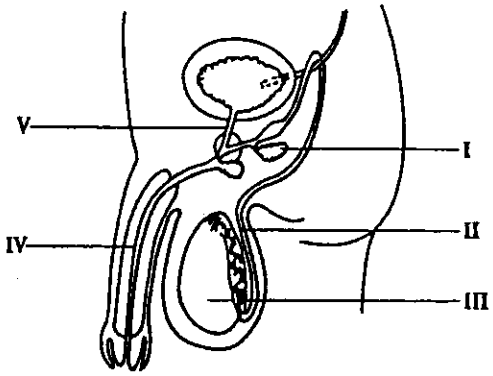
38. The pituitary gland is called the 'master gland' because it

(A) controls other endocrine glands
(B) controls thought processes
(C) is found in the brain
(D) is the largest gland

39. One advantage that sexual reproduction has over asexual reproduction is that sexual reproduction

(A) is conservative
(B) leads to variation
(C) produces disease-resistant crops
(D) produces greater numbers of offspring

Items 40–41 refer to the following diagram of a longitudinal section of the human male reproductive system.



40. Production of spermatozoa occurs in

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

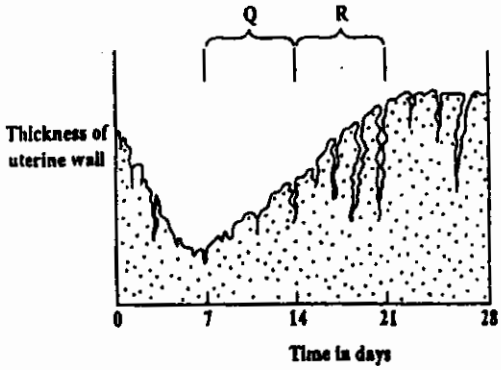
41. Passage of urine occurs through

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

42. The process whereby an embryo attaches itself to the lining of the uterus is called

(A) implantation
(B) fertilization
(C) copulation
(D) gestation

Item 43 refers to the following diagram which shows the change in the thickness of the uterine wall.



43. The change in the thickness of the wall of the uterus in phases Q and R is brought about by

(A) increase in oestrogen
(B) increase in oestrogen and progesterone
(C) decrease in oestrogen and progesterone
(D) increase in oestrogen and decrease in progesterone

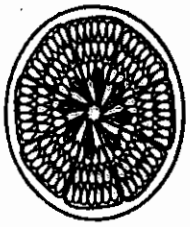
44. Which of the following is the function of the testa in a seed?

(A) Absorbs water for germination
(B) Offers physical protection
(C) Forms part of the developing embryo
(D) Is the food source for the developing embryo

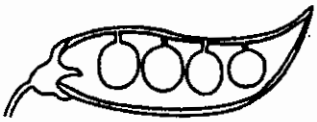
Item 45 refers to the following drawings showing fruits A, B, C and D.

(A)

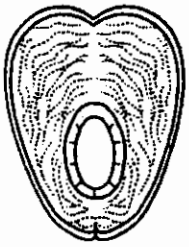
(B)



(C)



(D)



45. Which of the fruits above is dispersed by water?

46. The gene for coat colour in cattle shows incomplete dominance. A purebred cow with red coat, mates with a purebred bull with white coat. All of the offspring have roan coats. Which of the following represents the genotype of the offspring?

(A) RR
(B) WW
(C) RW
(D) RO

47. Which of the following does NOT result in natural selection?

(A) Mutation
(B) Grafting
(C) Variation
(D) Migration

48. Which of the following statements about the importance of genetic variation is true?

(A) More offspring can be produced.
(B) Competition is reduced among individuals.
(C) Advantageous characteristics are passed to offspring.
(D) Mutations are less likely to occur.

49. Mitotic division results in

(A) two daughter cells with chormosome number, n
(B) four daughter cells with chromosome number, 2n
(C) two identical daughter cells with chromosome number, 2n
(D) four identical daughter cells with chromosome number, 2n

50. Which of the following processes may be used by humans to change a characteristic of a particular organism in a short time?

I. Genetic engineering
II. Artificial selection
III. Natural selection

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

51. Which of the following factors does NOT contribute to hypertension (high blood pressure)?

(A) Old age
(B) High salt intake
(C) Regular exercise
(D) Saturated fat in the diet

52. Biological vectors of a disease can

(A) spread all diseases
(B) spread only those diseases where the pathogen must be carried from host to host
(C) spread the pathogen only if part of its life cycle is completed in the body of the vector
(D) be less easily targeted from the pathogen when controlling the spread of the disease

53. Which of the following statements is true about sexually transmitted infections?

(A) They are difficult to control.
(B) They are caused by bacteria.
(C) They are transmitted by vectors.
(D) They affect the respiratory system.

54. The rapid spread of HIV/AIDS can be MOST effectively reduced if

(A) a vaccine is made available
(B) treatment is given to all infected with the HIV
(C) all blood is screened before transfusions
(D) risky behaviours linked to transmission methods are eliminated

55. The type of disease that can be prevented by immunization is

(A) pathogenic
(B) deficiency
(C) hereditary
(D) psychological

56. Which of the following statements is NOT true about humus?

(A) It improves soil texture.
(B) It increases water retention in soils.
(C) It supplies nutrients to plants and soil organisms.
(D) It reduces aeration of soils.

Item 57 refers to the following table which represents data collected for three species of organisms in a particular habitat when five quadrats are thrown. Each quadrat measures 1 m².

Specimen	Q1	Q2	Q3	Q4	Q5	Total number of organisms counted in 5 quadrats
P	3	5	1	1	0	10
Q	5	0	0	0	0	5
R	1	5	5	5	4	20

57. Which of the following represents the species density for species R?

(A) 1 m²
(B) 4 m²
(C) 5 m²
(D) 20 m²

58. Which of the following factors limits the growth of natural populations?

(A) Abundance of food supply
(B) Absence of predators
(C) Control of diseases
(D) Competition for space

59. Which of the following statements BEST describes a fossil fuel?

(A) A substance humans use for fuel
(B) A substance humans produce
(C) The compressed remains of dead plants and animals which can be used as fuel
(D) Mineral compounds which occur as part of the earth's surface and which can be used as fuel

60. Which of the following pollutants competes with oxygen for haemoglobin?

(A) Ozone
(B) Carbon dioxide
(C) Carbon monoxide
(D) Hydrogen sulphide

END OF TEST

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