

Biology 1983- 2004

JAMB

Past Questions

Biology 1983

- 1 Root hairs are developed from the
 A. root apex B. epidermis of roots
 C. vascular bundles D. endodermis
 E. pericycle

Use Fig. 1 to answer questions 2-4

Fig 1

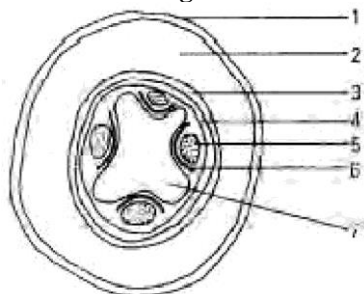


Fig 1 represents a cross-section of a part of a dicot plant.

- 2 Which of the following features can be used to identify Fig 1?
 A. Position of 7 B. Its circular nature C. Number of 5
 D. Presence of 3 E. Width of 2.
- 3 The main function of 6 is to
 A. separate 5 from 7 B. produce more of 5 and 7.
 C. produce cork D. translocate water and mineral salt
 E. conduct carbon dioxide to the other parts.
- 4 The main function of 4 is to
 A. surround the inner tissues B. produce cork
 C. produce root hairs D. produce lateral roots
 E. produce more of 3.
- 5 In a dicot leaf, guard cells differ from other epidermal cells because they
 A. have no definite shape B. lack nuclei
 C. are smaller D. contain chloroplasts E. lack vacuole.
- 6 Which of the following structures is NOT found in the female agama lizard?
 A. Pre-anal pads B. Eardrum C. Gular fold
 D. Nasal scale E. Nuchal crest.
- 7 Herbs differ from shrubs because they
 A. do not produce fruits B. are useful to herbalists
 C. do not become woody D. are only annuals E. are only perennials.
- 8 If an isolated living cell is left in distilled water for two hours, it is likely to
 A. lose some of its water to the surrounding water
 B. lose all of its water to the surrounding water
 C. reproduce by binary fission D. become more turgid.
 E. die due to excess water.
- 9 If an organic compound has its Hydrogen: Oxygen ratio as 2:1, it is likely to be
 A. a protein B. a carbohydrate, C. a fat
 D. a fatty acid and glycerol E. an amino acid.
- 10 Which of the following elements are necessary for the formation of chlorophyll in a plant?
 A. Magnesium and iron B. Calcium and potassium
 C. Calcium and sulphur D. Potassium and sulphur
 E. Phosphorus and potassium.
- 11 Which of the following statements is NOT true of mammalian erythrocytes?
 A. They have haemoglobin B. They appear yellow when looked at singly
 C. They are disc-shaped D. The cells are more numerous than leucocytes
 E. They have nuclei at maturity.
- 12 In woody plants, gases and water vapour are transported across the stems by the
 A. xylem fibres B. medullary fibres C. medullary rays
 D. phloem fibres E. phloem parenchyma.
- 13 Which of the following substances is NOT found in urine?
 A. Water B. Sodium chloride C. Nitrogenous compounds
 D. Calcium chloride E. Nitrogenous salts.
- 14 The kidneys of all vertebrates act as osmo regulators. This means that they
 A. keep the composition of the plasma constant
 B. regulate osmotic processes C. Control the volume of blood entering the kidneys
 D. decrease the osmotic pressure of blood E. increase the osmotic pressure of blood.
- 15 The movement of part of a plant in response to external stimulus of no particular direction is
 A. taxism B. tropism C. haptotropic movement
 D. nastic movement E. phototropism
- 16 The part of the mammalian brain responsible for maintaining balance is the
 A. medulla oblongata B. olfactory lobe
 C. cerebellum, D. cerebrum E. frontal lobe.

17.

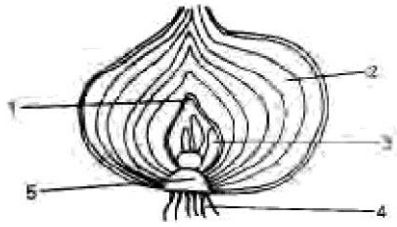


Fig vertical section of onion bulb.

Which of the labelled parts in Fig 2 will develop into a new bulb? A. 1 B. 4 C. 2 D. 3 E. 5.

18

In the onion bulb, food is stored in the
A. stem B. lateral buds C. cotyledons
D. outer scale leaves E. leaf bases.

- 19 Groundnut is not really a 'nut' in the biological sense because
 A. it is harvested from inside the ground B. its pericarp is not hard and tough. C. the fruit is succulent
 E. it is an achene.
- 20 What type of fruit is formed from a single flower having several free carpels?
 A. multiplefruit B. Simplefruit C. Aggregate fruit
 D. Dehiscent fruit E. Indehiscent fruit.
- 21 A 28g soil sample was heated to a constant weight of 24g. When further heated to red hot and cooled, it weighed 18g. What is the percentage of humus in the soil?
 A. 22.2 B. 55.6 C. 75.0 D. 25.9 E. 35.7.
- 22 Which of the following diseases is NOT caused by a virus?
 A. Rinderpest B. Maize rust C. Newcastle disease
 D. Swine fever E. Cassava mosaic disease.
- 23 A centipede differs from a millipede by its
 A. colour B. numerous abdominal segments
 C. paired legs on each abdominal segment
 D. poison claws E. cylindrical body.
- 24 An organism having one pair of identical genes is
 A. a heterozygote B. a hybrid C. an allelomorph
 D. a homozygote E. a diploid
- 25 Plants which can survive in places where the water supply is limited are
 A. bryophytes B. mesophytes C. xerophytes
 D. hydrophytes E. pteridophytes.
- 26 Banana, plantain and pineapple can be grouped together because they
 A. produce small seeds B. are multiple fruits
 C. produce suckers D. have runners E. have bulbils.
- 27 One disease NOT caused directly by bacteria is
 A. malaria B. tuberculosis C. pneumonia D. tetanus
 E. cholera.
- 28 In what order do the following structures develop during the metamorphosis of the toad? 1. External gills 2. Internal gills 3. Forelimbs 4. Hindlimbs 5. Mouth.
 A. 1 2 3 4 5 B. 1 5 2 4 3 C. 1 3 4 5 D. 5 3 4 1 2
 E. 5 4 3 2 1.
- 29 The dental formula $i \frac{3}{3}; c \frac{1}{1}; pm \frac{4}{4}; m \frac{2}{3} = 42$ represents that of a
 A. rabbit B. full grown man C. young child
 D. dog E. sheep.
- 30 Which of the following statements is NOT true of insectivorous plants?
 A. They obtain part of their food by trapping and feeding on insects B. They attract insects simply because of pollination. C. They can grow in soils poor in nitrogenous salts. D. They can supplement the nitrogen supply by feeding on insects E. Examples include butterworts, sundews and pitcher plants.
- 31 Which of these worms is beneficial to man?
 A. Hookworm B. Tapeworm C. Roundworm
 D. Earthworm E. Guinea worm. 32 Starting from the skull end, the vertebrae are arranged in the following order:
 A. axis, atlas, cervical, thoracic and lumbar
 B. atlas, cervical, axis, thoracic and lumbar
 C. atlas, axis, thoracic, cervical and lumbar
 D. atlas, axis, cervical, thoracic and lumbar
 E. atlas, thoracic, cervical axis and lumbar.
- 33 Which of the following diseases could be exclusively associated with a river basin?
 A. Malaria B. Syphilis C. Onchocerciasis
 D. Cholera E. Poliomyelitis.
- 34 Which of the following represents the evolutionary sequence in these plants? 1. Flowering plants, 2. Ferns, 3. Mosses, 4. Algae, 5. Conifers.
 A. 2 () 1 () 4 () 3 () 5 B. 5 ~ 4 ~ 3 ~ 2 ~ 1
 C. 2 4 5 1 3 D. 3 C Z 2 C Z 4 ' ' 5 C Z 1 E. 4 ~ 3 ~ 2 ~ 5 ~ 1
- 35 Which of the following will NOT allow osmosis to take place?
 A. pig's bladder B. Cellophane C. Parchment paper
 D. Transparent polythene E. Cow's bladder.
- 36 Which of the following statements on the mammalian circulatory system is Not true?
 A. Blood in the pulmonary artery is richer in oxygen content than blood in the pulmonary vein
 B. The blood in the hepatic portal vein is the richest in food substances. C. Blood flow is controlled by valves in the veins D. Arteries are generally thicker and larger than veins. E. Fibrin helps in the formation of blood clot.
37. In a positive phototropic response of a coleoptile, the region of greatest curvature is brought about by the
 A. movement of auxins away from the region of curvature, B. even distribution of auxins in all parts of the coleoptile, C. inhibition of growth by auxins in the region of smaller curvature
 D. concentration of auxins in the region of curvature E. absence of auxins in the coleoptile.
- 38 The tuber of cassava is NOT a stem tuber because it
 A. is distended with food reserve B. has an aerial shoot portion C. has other structures that could be called roots D. lacks axillary buds
 E. has a bark over its stored food.
- 39 The function of the ossicles (malleus, incus and stapes) in the mammalian ear is the
 A. transmission of vibrations B. regulation of pressures C. support of the inner ear
 D. maintenance of balance during motion
 E. secretion of oil.

- 40 Which of the following instruments is used for determining turbidity of water?
A. Thermometer B. Secchi Disc C. Rain gauge
D. Hygrometer E. Wind vane.
- 41 Which of the following is NOT a characteristic of

monocot plants?

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- A. occurrence of secondary thickening B. Parallel venation C. Scattered vascular bundles
D. Floral parts arranged in threes, E. Perianth is usually insignificant → → → →
42. Which sequence represents the correct order of organisms in a food chain? 1. Toad, 2. Mucuna, 3. Grasshopper, 4. Snake, 5. Hawk.
A. 5 4 1 3 2 B. 1 2 3 4 5
C. 2 1 3 4 5 D. 2 3 1 5 4
E. 2 3 1 4 5
43. In Rhizopus, carbohydrate is stored in the form of
A. glucose B. paramylon C. glycogen D. starch E. oil
44. Which of the following statements about the rate of transpiration is INCORRECT? It is
A. dependent on temperature B. affected by changes in light intensity C. unaffected by humidity
D. dependent on air movement E. affected by availability of water.
45. 'Jointed skeleton' is absent in the
A. cockroach B. spider C. millipede D. snail
46. Which of the following statements about the definition of man is INCORRECT? Man has
A. more molars than incisors B. no diastema
C. the same number of teeth on upper and lower jaws
D. a total of thirty-two teeth E. a total of six molars.
- E. dragon fly. When a Spirogyra cell is immersed in a salt solution more concentrated than its cell sap, it
A. remains unchanged B. takes up water and bursts
C. absorbs a little water D. loses water and shrivels
E. becomes turgid.
1. Urea is produced in the A. liver, B. Ladder, C. spleen, D. kidneys. E. gall bladder
2. What is the genetic ratio of the F₂ generation if members of F₁ generation are allowed to self-pollinate?
A. 1 tall: 3 short B. 3 tall: 1 short C. 1 tall: 1 short
D. 4 shorts: 0 tall E. 4 tall: 0 short
3. The path taken by glucose from the ileum to the heart is
A. ileum → hepatic portal vein → hepatic artery → vena cava heart.
B. ileum → hepatic portal vein → hepatic artery → venacave heart.
→ C. ileum → hepatic portal vein → vena cava heart
D. ileum → hepatic vein → vena cava heart.
E. ileum → hepatic portal vein → hepatic vein → vena cava heart.

Biology 1984

1. The mouth parts of the housefly are adapted for
A. lapping and sponging. B. sucking and chewing.
C. piercing and sucking. D. chewing and lapping.
E. biting and chewing.
2. The male toad differs from the female by having
A. vocal sacs. B. shorter hind limbs.
C. longer fore limbs. D. bulging eyes.
E. nictating membrane.
3. Mosses, liverworts and ferns can be grouped together because they
A. are all aquatic plants. B. all grow in deserts.
C. are seedless plants. D. have undifferentiated plant bodies. E. all produce colourless flowers.
4. Spirogyra and Mucor can be grouped together as Thallophyta because.
A. they are unicellular organisms B. their spores could be dispersed by wind C. they are capable of living independent lives D. they reproduce sexually only E. their bodies are made up of thallus and filaments alternatively.
5. Which of the following invertebrates does NOT possess antennae?
A. Centipede B. Crustacean C. Millipede
D. Insect E. Spider 6. Which of the following is INCORRECT? The prothallus of a fern
A. is a flattened heart-shaped structure.
B. is green because its cells contain chloroplasts
C. is the dominant plant D. bears the sexual organs
E. is attached to the ground by numerous rhizoids.
7. Which of the following cell constituents is NOT common in both plants and animals?
A. Mitochondria B. Chloroplasts
C. Ribosomes D. Golgi apparatus
E. Vacuoles.
8. The character-producing factors in living organisms are
A. chromomeres B. alleles C. chromatids

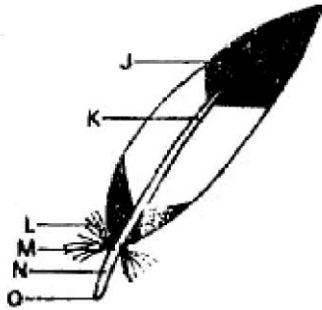
D. chromosomes E. genes.

9 A mixture of mercurous and mercuric nitrates is added to a food substance. A white precipitate is formed which on gentle heating turns red. The food substance is

- A. protein B. oil C. Carbohydrate
D. Fat E. Fatty acid.

10 The mammalian organ through which nourishment and oxygen diffuse into a developing embryo is called
A. amnion B. chorion C. umbilical cord
D. oviduct E. placenta

11. Fig 1 represents a quill feather. The structure labelled "M" is the
 A. quill B. rachis C. superior umbilicus
 D. inferior umbilicus E. aftershaft



12. Osmosis can be defined as the movement of
 A. molecules from solution of high concentration to low concentration
 B. molecules from solution of low concentration to high concentration
 C. water from solution of high concentration to low concentration
 D. Water across a semi-permeable membrane from solution of low concentration to high concentration
 E. water across a semi-permeable membrane from solution of high concentration to low concentration
13. Which of the following statements is NOT true of enzymes? They
 A. are proteins B. need cofactors to activate them
 C. are sensitive to hydrogen ion concentration
 D. are specific in their action
 E. can withstand high temperatures.
14. The dorsal and anal fins of fish are used for
 A. upward movements B. controlling rolling movements
 C. downward movements
 D. steering E. buoyancy.
15. Exoskeleton is NOT found in the
 A. maggot B. mosquito larva C. earthworm
 D. caterpillar F. termite
16. Blood clotting is initiated by
 A. leucocytes B. platelets C. haemolymph
 D. haemoglobin E. erythrocytes
17. Pepsin is a digestive enzyme which breaks
 A. cellulose into glucose molecules
 B. carbohydrates into simple sugars
 C. protein into peptones
 D. fats into glycerol and fatty acids
 E. sucrose into glucose and fructose.
18. Anaerobic respiration in yeast produces
 A. carbon dioxide and ethanol
 B. carbon dioxide and water
 C. carbon dioxide and oxygen
 D. carbon dioxide and glucose
 E. ethanol and water
19. Underground stems which grow horizontally through the soil are
 A. tubers B. rhizomes
 C. runners
 D. corms E. stolons

20. A man with a normal haemoglobin (AA) marries a woman who has sickle-cell haemoglobin (SS). They have a child who has sickle-cell trait. Which of the following genotypes could be associated with the child's haemoglobin?
 A. AA B. OO C. AO
 D. AS E. SS
21. In a Biuret test, some protein was mixed with sodium hydroxide solution. Which of the following chemicals should be added to the mixture for a positive result?
 A. Mercurous nitrate B. Copper sulphate
 C. Mercuric nitrate D. Sodium carbonate
 E. Ammonium hydroxide
22. The removal of a man's pancreas by surgical operation can affect only the digestion of
 A. starch B. starch, protein and fats
 C. oils and fats D. proteins
 E. carbohydrate and fats.
23. The parts used by tapeworm to fasten itself to the host's intestine are the
 A. neck and suckers B. hooks and suckers
 C. rostellum and suckers
 D. young proglottis and neck
 E. rostellum, hooks and suckers.

Use Fig 2 to answer questions 24 - 25

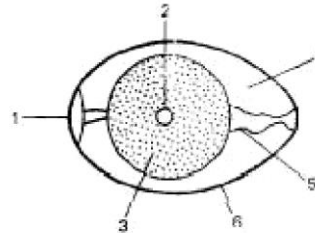


Fig 2. transverse section of a fowl's egg

24. The young chick is formed from
 A. 3 B. 3 and 4 C. 1, 3 and 5 D. 2 E. 4
25. Which parts provide food for the developing chick?
 A. 2 and 3 B. 4 and C. 3 and 4
 D. 2 and 5 E. 1 and 2
26. Which of the following types of vertebrae occur in equal numbers in the rabbit, rat and man?
 A. Caudal B. Thoracic
 C. Lumbar
 D. Cervical E. Sacral
27. Which of the following statements is NOT true of the piliferous layer of a root? It
 A. has a very thin cuticle
 B. is the outermost layer of the cortex
 C. may bear root hairs
 D. breaks down as the root ages
 E. is replaced by cork in old roots.
28. A flowering plant is monoecious if
 A. the androecium is found on one plant

- B. the gynoecium is monocarpous
- C. it produces essential organs
- D. the gynoecium and androecium are on the same plant
- E. the flowers are unisexual

29. How many nuclei are found in a pollen tube during fertilization?
A. 2 B. 3 C. 5 D. 6 E. 7
30. Which of the following is NOT a waste product of plants?
A. Tannin B. Oxygen C. Carbon dioxide
D. Sap E. Alkaloids
31. If an animal is very active and has good muscular control, it is likely to have well-developed
A. olfactory lobes B. cerebral hemispheres
C. optic lobes D. cerebellum E. spinal cord
32. Which of the following adaptations is NOT concerned with the flight of birds?
A. Streamlined shape B. Presence of powerful muscles
C. Reduced body weight D. Broad sternum
E. Webbed feet.
33. The transect method can be used in ecology to show the
A. number of plants and animals in a habitat
B. population of a plant species
C. distribution of organisms along a line
D. heights of trees in a section of a forest
E. number of young plants across a forest.
34. Asexual reproduction does NOT occur in
A. Mucor, Spirogyra and Paramecium
B. Penicillium, Paramecium and Amoeba
C. Mucor, Rhizopus and penicillium
D. Amoeba, spirogyra and Mucor
E. Rhizopus, Ascaris and Amoeba.
35. Fehling's solution will readily change colour from blue to a reddish colour when it is
A. mixed with sugar solution in the cold
B. warmed or heated by itself
C. mixed with reducing sugar in the cold
D. warmed or heated with a complex solution
E. warmed with a solution of reducing sugar.
37. Normally the flow of blood is NEVER from
A. artery to arterioles B. arterioles to capillaries
C. capillaries to venules D. arterioles to the artery
E. venules to the vein
38. Heat produced in tissue respiration in plants is
A. a chemical form of energy B. the only form of energy
C. the main form of energy D. a useful form of energy
E. a waste form of energy.
39. The axial skeleton of a mammal does not include the bones of the
A. skull B. tail C. limbs D. back E. neck.
40. Which of the following sequences represents the process of blood clotting?
1. Fibrin forms a network of threads
2. Red blood cells are caught and a clot is formed
3. Fibrinogen in plasma changes into soluble fibrin
4. Blood is exposed to air.
A. 4,3,2,1 B. 4,3,1,2 C. 3,1,4,2 D. 1,2,3,4
E. 3,1,2,4.

41. Green plants are important in the ecosystem because they are
A. primary consumers B. producers
C. decomposers D. secondary consumers
E. scavengers.
42. An anemometer is an instrument for measuring
A. relative humidity B. altitude C. wind speed
D. turbidity E. salinity.
43. Which of the following is NOT regarded as a pollutant on land or in the air?
A. Noise B. Smoke C. Sulphur dioxide
D. Carbon monoxide E. Nitrogen
44. Which of the following groups of factors is completely abiotic?
A. salinity, tide, plankton, turbidity
B. Temperature, pH, soil insect
C. Wind, altitude, humidity, light
D. Conifers, winds, pH, rainfall
E. Soil, water, bacteria, salinity
45. Which of the following lists of diseases, their causes and transmission is CORRECT?
A. Cholera, virus, severe diarrhoea, infected water.
B. Malaria, protozoan, high fever, contact with infected person
C. Syphilis, virus, venereal disease, sexual intercourse
D. Smallpox, virus, skin with blister, close contact with infected person.
E. Sleeping sickness, bacteria, tiredness, headaches and dozing, tsetse fly bite
46. Erosion can be reduced along a slope by
A. ridging across slope B. ridging up slope
C. ridging down slope D. crop rotation
E. bush fallowing system.
47. If a handful of soil is shaken with water and left to settle, the soil particles will settle from light to heavy particles as follows:
A. humus, clay, silt, sand, stones
B. humus, silt, clay, sand, stones
C. humus, clay silt, stones, sand
D. humus, sand, silt, clay, stones
E. clay, humus, silt, sand, stones.
48. Denitrifying bacteria in nature liberate gaseous nitrogen directly from
A. ammonium salts
B. soil nitrates
C. thunderstorms
D. soil nitrites
E. plant and animal proteins.
49. Leaching is
A. washing away of humus from the soil surface
B. reduction of soil aeration by pressure
C. soil erosion by means other than rainfall
D. loss of organic matter due to exposure to direct sunlight
E. washing out of chalk and limestone from upper layers of soil by heavy rains
50. The process of soil erosion is usually from
A. rill sheet gully B. gully rill sheet
C. sheet gully rill D. sheet rill gully
E. rill gully sheet

Biology 1985

1. In Spirogyra, the pyrenoid
A. excrete waste products B. is suspended by cytoplasmic strands
C. is mainly used for respiration D. usually contains starch
E. makes the plant slimy to touch.
2. In which of the following groups of animals are flagella and cilia found?
A. Flatworms B. Annelids C, Coelenterates
D. Protozoa E. Nematodes
3. Which of the following is seed bearing?
A. Mosses B. Whistling pine
C. Algal filaments D. Livewort
E. Fern fronds.
4. Each of the following is an arthropod EXCEPT the
A. crab B. spider C. snail D. millipede
E. cockroach
5. In fish the sense organs which detect movements in the water are located within the
A. gills B. operculum C. nostrils D. median fins
E. lateral line.
6. Euglena is an autotrophic organism because it
A. has flagella B. has plant and animal features
C. is found in water D. can manufacture its food
E. moves fast.
7. Which of the following is **NOT** true of Mucor? It
A. contains chlorophyll B. grows saprophytically
C. bears spores in sporangium
D. consists of hyphae
E. reproduces by conjugation
8. Bryophytes are different from flower because they
A. live in moist habitats B. are small plants
C. reproduce sexually and a sexually
D. have small leaves
E. have no vascular tissues.
9. At what stage in the life history of a toad is its mode of breathing similar to that of a fish?
A. Tadpole stage B. External gill stage
C. Adult stage D. Internal gill stage
E. Larval stage.
10. In lower plants like mosses, the structure which performs the functions of roots of higher plants is called
A. root hairs B. rootlets C. hyphae
D. rhizoids E. thalli.
11. In an angiosperm leaf, the xylem is
A. beside the phloem B. surrounded by the phloem
C. above the phloem D. around the phloem
E. in separate bundles from the phloem.

12. A group of similar cells performing the same function is
A. an organ B. a system C. a tissue
D. an organelle E. an enzyme.
13. Which of the following is common to a dicotyledonous stem and a monocotyledonous root?
A. Medullary rays B. Central pith
C. Wide cortex D. Narrow cortex
E. Pericyclic fibres.
14. Which of the following represents the sequence of protein hydrolysis? 1.Polypeptides 2.Amino acids 3. Proteins 4. Peptones
A. 3 1 2 4 B. 3 ~ 2 ~ 4 ~ 1 C. 3 ~ 4 ~ 2 ~ 1 D. 3 ~ 4 ~ 1 2
E. 3'Z1cZ4cZ2
15. A food substance which produces red colouration with Sudan III contains
A. protein B. sugar C. starch
D. cellulose E. fat.
16. If calcium is deficient in food this may cause
A. anaemia B. retarded growth
C. sterility D. goitre E. beri-beri
17. Partially digested food ready to leave the stomach is referred to as
A. chyme B. curd C. glycogen D. paste
E. roughage
18. The function of lymph nodes is to
A. supply oxygen B. filter out bacteria
C. form red blood D. supply amino acids
E. supply simple sugars
19. The vein which returns blood from the head and arms to the heart is called
A. aorta B. inferior vena cava C. superior vena cava
D. pulmonaryvein E. pulmonary artery.
20. Blood platelets are important because they
A. are amoeboid and nucleated B. produce antitoxins C. produce antibodies
D. digest harmful bacteria E. release thrombin for blood clotting.
21. If a child can receive blood from all donors, he belongs to the blood group
A. O B. A C. B D. AB E. AS.
22. Which of the following events does NOT occur during anaerobic respiration of glucose?
A. Muscle cell produce lactic acid B. Carbon dioxide is produced C. Milk bacteria produce lactic acid D. Energy is not produced
E. Germinating seeds produce alcohol.

23. Identify which of the following are characteristics of the vertebrate respiratory surface 1. Moist 2. Vascularized 3. Semipermeable 4. Freely permeable 5. Dry
A. 1,2,3 B. 1,2,5 C. 2,3,5 D. 2,4,5 E. 1,3,5.

24. In mammals, the function of the sebaceous gland is to
A. produce sweat B. secrete sodium
C. secrete water D. produce an oily substance
E. manufacture vitamin D for the skin.

25. Which of the following organs regulates the amount of amino acids and glucose in the body?
A. Kidney B. Liver C. Pancreas D. Spleen
E. Stomach.

Use the diagram below to answer questions 26 and 27

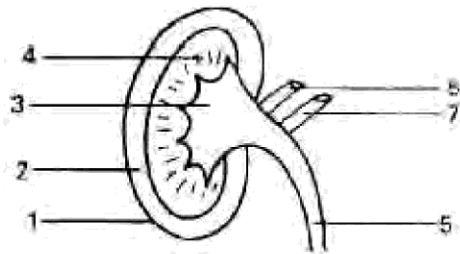


Fig. 1

26. Bowman's capsules are located in the part labelled
A. 1 B. 2 C. 3 D. 4 E. 5 F. 6

27. Re-absorption of useful materials takes place in the parts labeled.
A. 1 and 3 B. 3 and 5 C. 5 and 6
D. 6 and 7 E. 2 and 4

28. Movements and positions of the head in man are detected by the
A. cochlea B. malleus C. utriculus
D. semicircular canals E. outer

29. The appendicular skeleton is made up of the
A. limbs B. skull and limbs C. phalanges
D. ulna and radius E. girdles and limbs.

30. The maize grain is a fruit and not a seed because it
A. has a large endosperm B. is formed from an ovary
C. is a monocotyledon D. has no plumule and radicle
E. has a hypogeal germination.

31. If a flower is protandrous then it
A. must be unisexual B. has an undeveloped anther
C. has no anther D. must be insect pollinated
E. can prevent self-pollination.

32. For pollen to be released in *Crotalaria* the insect must depress the
A. wing B. keel C. standard D. antepetalous stamen
E. antepetalous stamen.

33. Irish potato is a
A. bulb B. tap root C. rhizome D. root tuber
E. stem tuber.

34. The characters by which an organism is recognized are termed its
A. phenotype B. genotype
C. morphology D. anatomy E. physiology.

35. The hereditary material in a cell is known as
A. ADP B. CNS C. RNA D. ATP E. DNA.

36. A young plant showing yellow leaves is likely to be deficient in
A. calcium B. magnesium C. potassium
D. boron E. molybdenum.

37. Germination which results in the cotyledons being brought above ground is called
A. hypocotyls B. epicotyl C. epigeal
D. hypogeal E. plumule.

38. The mammalian endocrine system is responsible for
A. transmitting impulses B. regulating body temperature
C. regulating osmotic pressure of blood
D. chemical co-ordination E. the manufacture of blood.

39. An old man is likely to be long-sighted because age effects the
A. optic nerves B. retina C. ciliary muscles
D. cornea E. aqueous humour.

40. In a mammal, stimulus is transferred from the receptor muscle to the central nervous system through the
A. motor neurons B. effector muscles
C. dendrites D. sensory neurons E. synapses.

41. A relationship between living organisms which is of mutual benefit is
A. parasitism B. saprophytism C. ecosystem
D. symbiosis E. commensalism.

42. Which of the following food chains is in the correct sequence?

- A. ~~Weeds~~ Tadpoles ~~Beetles~~ Fish
Man → → →
B. ~~Weeds~~ Tadpoles ~~Fish~~ Beetles
Man. → → →
C. ~~Tadpoles~~ ~~Beetles~~ ~~Weeds~~ Man ~~Fish~~

43. The primary and secondary hosts respectively of bilharzia are
A. fish and man B. man and dog C. snail and man
D. man and snail E. fish and snail

44. Which of the following is NOT caused by bacteria?
A. Cholera B. Gonorrhoea C. Tuberculosis
D. Onchocerciasis E. Typhoid.

45. Tsetse fly is harmful to man because it is associated with the spread of
A. river blindness B. malaria C. sleeping sickness
D. leprosy E. dysentery.

- 46 Soil erosion *CANNOT* be controlled by
A. planting cover crops B. contouring of sloping ground
C. terracing of slopes
D. laying of mulch E. burning of bush
- 47 Water retention is highest in soils which are rich in
A. sand, poor in humus and devoid of clay
B. clay and sand, but poor in humus
C. clay and humus, but poor in sand
D. clay, poor in humus and devoid of sand
E. Sand and humus, but poor in clay
- 48 The origin of mineral particles in the soil is
A. humus B. water C. micro-organisms
D. weathered rock E. organic matter
- 49 Atmospheric nitrogen is directly replenished in nature through
A. the activities of denitrifying bacteria
B. the breakdown of ammonium salts in the soil
C. the activities of nitrifying bacteria
D. the activities of nitrogen-fixing bacteria in root nodules
E. egestion, death and decay
- 50 The initial volume of water poured into a bag of dry soil was 50ml and the amount that drained through was 35ml. The percentage water content of the fully soaked soil is therefore
A. 46.7 B. 25.0 C. 20.0 D. 30.0 E. 58.3.

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- 1 Viruses are regarded as non-living because they
A. can neither reproduce asexually nor sexually
B. cannot survive in their respective environments
C. do not possess characteristics to the next
D. can neither respire nor excrete.
- 2 Which of the following pairs are fully adapted to terrestrial life?
A. Ferns and algae B. Ferns and mosses
C. Bryophyte and flowering plants.
D. Flowering plants and conifers.
- 3 Which of these animals is radically symmetrical?
A. Squid B. Hydra C. Snail D. Cockroach.
- 4 Which of the following has cones?
A. Angiosperm B. Gymnosperm C. Pteridophyte
D. Bryophyte .
- 5 For effective functioning of a bird's quill feather, hooks fit on the ridges of the
A. vane B. rachis C. barbules D. barbs.
- 6 Which of the following is NOT true of Spirogyra?
A. Reproduces by conjugation B. Reproduces by fragmentation
C. Consists of branched filaments
D. Consists of unbranched filaments
- 7 Which of the following lacks chaetae, tentacles and antennae?
A. Snail B. Crab C. Millipede D. Earthworm.
- 8 Incomplete metamorphosis in the
A. butterfly B. grasshopper C. mosquito
D. housefly
- 9 Fishes are cold-blooded because their body temperature is
A. constantly low B. constantly high
C. dependent on that of their surroundings
D. regulated at will
- 10 When the original king and queen of termites die, they are replaced by
A. the king and queen of another colony
B. some adult reproductives from the same colony
C. some adult workers which are specially fed to breed.
D. Developing nymphs nurtured as secondary reproductives.
- 11 The male cockroach differs from the female by having
A. mandibles B. a pair of styles C. spiracles
D. a pair of cerci.
- 12 The fins making up the limbs of the bony fish are
A. caudal and ventral B. ventral and pelvic
C. pelvic and pectoral D. pectoral and dorsal.
- 13 The stem differs from the root in having the xylem and phloem strands
A. on the same radii B. scattered C. on alternate radii
D. towards the pith.
- 14 Oxygen liberated during photosynthesis has been demonstrated to come from
A. carbon dioxide B. air C. water D. chlorophyll.

- 5 Which of these is a trace element?
A. Iron B. Copper C. Calcium D. Sulphur.
- 16 The main organic substances found in the human body are
A. carbohydrates, proteins and salts B. salts, fats and proteins C. fats, carbohydrates and proteins D. salts, fats and carbohydrates.
- 17 Which of the following elements is essential for the formation of haemoglobin?
A. Sodium B. Potassium C. Calcium D. Iron.
- 18 The severe deficiency of vitamin C leads to
A. kwashiorkor B. beriberi C. pellagra D. scurvy