2003 - Biology

Bio 2003

1.

R— C—COOH

The chemical formula given above represents the basic constituent unit of

1.lipids.

2. proteins.

3. nucleic acids.

4. cellulose.

5. starch.

2. Which of the following is considered as the basic unit of life?

1. Atom

2. Amino acids

3.DNA

4. Proteins

5.cell

3. Ribosomes found in the chloroplasts of a plant cell

1.are of same size and composition to those seen in bacteria

2. are larger than those seen in bacteria but similar in composition.

3.are smaller than those seen in bacteria and different in composition.

4.are of the same size as those seen in bacteria but different in composition.

5.are similar in size and composition to those found in the cytoplasm of that eukaryotic cell.

4. The source of oxygen which acts as the terminal electron acceptor in the electron transport chain of aerobic organisms is

1. water.

2. glucose.

3. acetyl CO-A

4. molecular oxygen.

5. pyruvic acid.

\* The questions 5 and 6 are based on the following graphs (A - E), which show the rate of enzyme reaction (vertical axis) plotted against an unlabeled factor (horizontal axis).

5. Which one of the above graphs shows the relationship between rate of an enzyme reaction and pH?

1. A

2. B

3. C

4. D

5. E

6.Which one of the above graphs shows the relationship between rate of an enzyme reaction and substrate concentration?

1. A

2. B

3. C

4. D

5. E

7. Which one of the following statements regarding biodiversity is correct?

1. The three major divisions of biodiversity are species diversity, genetic diversity and habitat diversity.

2. Species diversity is the diversity among the organisms within a species.

3. Because of the increasing concern on biodiversity, all species that live on earth are most likely to be identified within the next 10 years.

4. The most number of animal species identified so far belong to the phylum Mollusca.

5. Genetic diversity contributes to the development of insecticide resistant varieties among insect pests.

8. Which one of the following correctly represents the scientific name of man according to binomial nomenclature?

1.Homo Sepians

2. Homo sapiens sapiens

3. Homo sapiens

4. Homo sapiens

5. Homo sepians

9. The last mass extinction on earth resulted in the extinction of

1. ammonites

2. trilobites.

3. primitive bony fishes.

4. dinosaurs.

5.mammoths

10. Which one of the following is an in - situ method of conservation?

1. Establishment of sanctuaries

2. Establishment of turtle hatcheries

3. Establishment of elephant orphanages

4. Establishment of seed banks.

5. Establishment of botanical gardens.

11. Which one of the following INCU categories includes the organisms that are most likely to become extinct first?

1. Low risk category

2. Vulnerable category

3. Rare category

4. Conservation dependent category

5. Data deficient category

12. Which one of the following is not essential for the production of action potential in a neuron?

1. Neurilemma

2. Threshold stimulus

3. Extracellular fluid

4. Myelin sheath

5. Na+ and K+

13. The first group of animals to develop photoreceptors during evolution is

1. coelenterates.

2. flat worms.

3. annelids.

4. arthropods.

5. molluscs.

14. Which one of-the following is unlikely to cause hypertension in man?

1. High level of low density lipoproteins in blood

2. Heavy consumption of alcohol

3. Sleep disturbances

4. Mental relaxation

5. Ageing

15. Which one of the following statements regarding the adult human skull is incorrect?

1. It is made up of 22 bones.

2. It has a capacity of around 2 litres.

3. It protects the middle ear.

4. Foramen magnum is located at its base.

5. Mandible articulates with the cranium.

16. Which one of the following statements regarding the digestive enzymes of man is incorrect?

1. Amylase converts starch into maltose.

2. Lipase converts fats into fatty acids and glycerol.

3. Pepsin converts proteins into amino acids.

4. Lactase converts lactose into glucose and galactose.

5. Chymotrypsin converts proteins into peptides and amino acids.

17. Which one of the following animals has a closed blood circulatory system with a single circulation?

1. Cockroach

2. Earth worm

3. Starfish

4. Man

5. Filaria worm

\* Questions 18 and 19 are based on the table given below. In the first column of the table, three parts of the inner ear of man are given. The major functions of these parts are given in the second column and the locations of these parts in the inner ear are given in the third column.

|  |  |  |
| --- | --- | --- |
| **Parts of the inner ear** | **Major functions** | **Locations in the inner ear** |
| A - Utricle  B - Ampullae  C - Organ of Corti | P - Involved in hearing  Q - Involved in the detection of the movement of head  R - Involved in the maintenance of position of head with respect to gravity | X – Semicircular canals  Y- Vestibule  Z - Cochlea |

18. The correct sequence of the major functions of the parts A, B, and C is

1. P, Q, R

2. Q, R, P

3. R, P, Q

4. R, Q, P

5. P, R, Q

19. 19. The correct sequence of the locations of the parts A and C in the inner ear is

1. X, Y, Z

2. X, Z, Y

3. Y, Z, X

4. Z, X, Y

5. Y, X, Z

20. In man, a thoracic vertebra can be distinguished from other vertebrae due to

1. its large size.

2. the presence of vertebrarterial canals.

3. the presence of a bifurcated neural spine.

4. the absence of an odontoid process.

5. the presence of articulatory surfaces on the centrum.

21. Which one of the following statements is incorrect regarding regulation of respiration in man?

1. Lowered blood pH increases respiratory rate.

2. Stimulation of stretch receptors in lungs causes inspiration to stop.

3. Respiratory centre is located in the pons Varolli and hypothalamus.

4. Chemoreceptors involved in regulation are located in carotid arteries.

5. Both glossopharyngeal and vagus nerves are involved in the regulation of respiration.

22. Which one of the following factors can be considered as least important in the vertical transport of water through the xylem.

1. Cohesive force

2. Transpiration pull

3. Adhesive force

4. Water potential gradient

5. Root pressure

23. Which one ofthe following elements when absent will produce deficiency symptoms first in the mature parts of the plant?

1. K

2. Mg

3. S

4. Cu

5. Synthesis of vitamins

24. A major function of K+ in a plant is seen in

1. stomatal movement.

2. chlorophyll synthesis.

3. cell division.

4. electron transport chain.

5. synthesis of vitamins.

25.Which one of the following represents the first stable product of C - 4 photosynthesis?

1. Phosphoglyceric acid

2. Oxaloacetate

3. Malic acid

4. Phosphoenol pyruvate

5. Glycolate

26.Which one of the following is seen only in angiosperms?

1. Development of an embryo in the life cycle

2. Presence of seeds

3. Presence of heteromorphic alternation of generation in the life cycle.

4. Presence of double fertilization in the life cycle.

5. Presence of xylem and phloem in the vascular system

27. In Which one of the following structures does meiosis take place?

1. Sporangium of Mucor.

2. Basidium ofAgaricus.

3. Antheridium of Pogonatum.

4. Microspore of Selaginella

5.Pollen tube of Angiosperms

\* Questions 28 and 29 are based on the following chart of the life 3 cycle of a heterosporous vascular plant.

28.Which of the following plants show life cycles represented by the above chart?

*1. Nephrolepis and pogonatum*

*2. Selaginella and Nephrolepis*

*3. Angiosperms and Cycas*

*4.Nephrolepis and angiosperms*

*5.Selaginella and Pogonatum*

29.The haploid generation in the above life cycle is represented by stages

1. A, B and C

2. B, C and D.

3. C, D and E

4. D, E and F

5. E, F and A.

30. A diagram of a cross-section of a root indicating the three major pathways (A, B, C) of horizontal water transport across the root in shown here. Which of the following represents the apoplast pathway, symplast pathway and vacuolar pathway in correct order?

1. A, B and C

2. B, C and D

3. C, D, and E

4. D, E and F

5. E, F, and A

• Questions 31 and 32 are based on the data given below.

Tall tomato plants having red fruits were crossed with short tomato plants having orange fruits. All plants in F1 generation were tall with red fruits. When F1 plants were crossed with each other the following phenotypic ratio was obtained in the F2 generation.

**Tall plants having red fruits: Short plants having orange fruits.**

**1 : 3**

31.Which one of the following statements is correct regarding the above observations?

1. The tall parent plants with red fruits are heterozygous.

2. Both types of parents are heterozygous

3. Independent assortment is shown by both characters.

4. In F2 generation, 50% are heterozygous.

5. The F1 plants are heterozygous for one character

32.