

Ambience Public School
Mid Term Exam 2024-25
Class XI
Subject- Biology
Date: 13/09/2024

Maximum Marks: 70

Time: 3 hours

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) Section-A has 16 questions of 1 mark each;
Section-B has 5 questions of 2 marks each;
Section- C has 7 questions of 3 marks each;
Section- D has 2 case-based questions of 4 marks each; and
Section-E has 3 questions of 5 marks each.
- (iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION A

- 1 As we go from species to kingdom in a taxonomic hierarchy, the number of common characteristics:
(A) Will decrease
(B) Will increase
(C) Remain the same
(D) May increase or decrease
- 2 Holdfast, stipe and frond constitute the plant body in case of:
(A) Rhodophyceae
(B) Chlorophyceae
(C) Phaeophyceae
(D) All of the above
- 3 During anaphase-I of meiosis:
(A) Homologous chromosomes separate
(B) Non-homologous autosomes separate
(C) Sister chromatids separate
(D) Non-sister chromatids separate
- 4 Which of the following statements is true for a secretory cell?
(A) Golgi apparatus is absent.
(B) Rough Endoplasmic Reticulum (RER) is easily observed in the cell.
(C) Only Smooth Endoplasmic Reticulum (SER) is present.
(D) Secretory granules are formed in the nucleus.

5 Different cells have different sizes. Arrange the following cells in an ascending order of their size. Choose the correct option among the followings:

- (i) Mycoplasma (ii) Ostrich eggs (iii) Human RBC (iv) Bacteria

- (A) (i), (iv), (iii) & (ii)
 (B) (i), (ii), (iii) & (iv)
 (C) (ii), (i), (iii) & (iv)
 (D) (iii), (ii), (i) & (iv)

6 A plant shows Thallus' level of organization. It shows rhizoids and is haploid. It needs water also to complete its life cycle because the male gametes are motile. Identify the group to which it belongs to:

- (A) Pteridophytes
 (B) Gymnosperms
 (C) Monocots
 (D) Bryophytes

7 Given below are some bacteria and their shapes. Select the correct match:

	Bacteria		Shape
a)	<i>Lactobacillus</i>	i	Comma
b)	<i>Streptococcus</i>	ii	spiral
c)	<i>Vibrio cholerae</i>	iii	spherical
		iv	rod shaped

- (A) a-i, b-ii, c-iv (B) a-iii, b-ii, c-i (C) a-iii, b-iv, c-ii (D) a-iv, b-iii, c-i

8 Which of the following cells of an adult will NOT exhibit mitosis?

- (A) Blood cells (B) Cells lining the gut (C) Heart cells (D) Cells of upper layer of epidermis

9 Circular DNA is found in

- (A) mitochondria, chloroplast, nucleus
 (B) nucleoid, mitochondria, nucleolus
 (C) bacteria, mitochondria, chloroplast
 (D) nucleoid, mitochondria, nucleus

10 All living organisms are linked to one another because

- (A) They have common genetic material of the same type
 (B) They share common genetic material but to varying degrees
 (C) All have common cellular organization
 (D) All of the above

11 The term 'systematics' refers to

- (A) Identification and classification of plants and animals
 (B) Nomenclature and identification of plants and animals
 (C) Diversity of kinds of organisms and their relationship
 (D) Study of habitats of organisms and their classification

12 Difference between virus and viroid is

- (A) Absence of protein coat in viroid but present in virus

- (B) Presence of low molecular weight RNA in virus but absent in viroid
 (C) Both (a) and (b)
 (D) None of the above

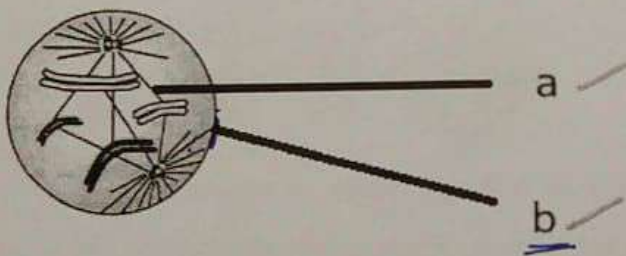
Questions No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

- a) Both A and R are true and R is the correct explanation of A.
 b) Both A and R are true and R is not the correct explanation of A.
 c) A is true but R is false.
 d) A is False but R is true.

- 13 Assertion : Palmitic acid is an unsaturated fatty acid. (1) *d*
 Reason : These are fatty acids without double bonds.
- 14 Assertion : Viruses are obligate parasites. *a*
 Reason : They are inert outside their specific host cells.
- 15 Assertion: Mitochondria of active cells has more number of cristae. *a*
 Reason: Cristae are the inner folds and are involved in ATP production.
- 16 Assertion : The amino acid glycine comes under the category of nonessential amino acids. *a*
 Reason : Glycine can be synthesized in the body.

SECTION B

- 17 (A) Determine the stage shown in the given diagram..



- (B) Label a and b in the given diagram .

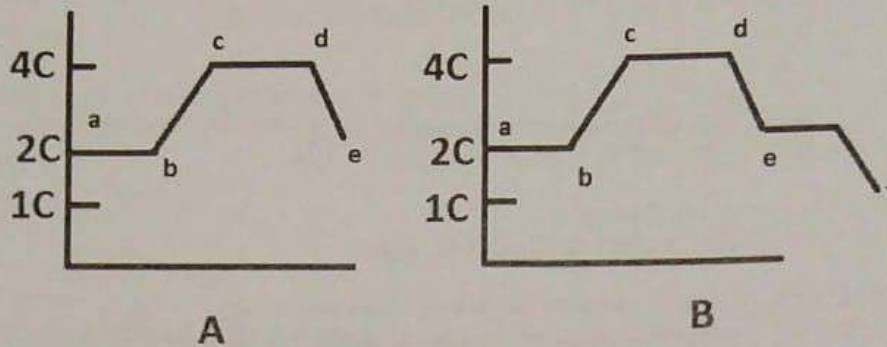
- 18 Suppose you accidentally find an old preserved permanent slide without a label. In your effort to identify it, you place the slide under microscope and observe the following features:
- Unicellular
 - Well defined nucleus
 - Biflagellate—one flagellum lying longitudinally and the other transversely.

Identify the kingdom and give one unique feature of the same kingdom.

- 19 SER will be more in liver cells, RER will be more found in greater numbers in muscle cells. Explain
- 20 Why is there a need to standardize the system of naming of living organisms?
- 21 Diatoms are also called 'pearls of ocean', why?

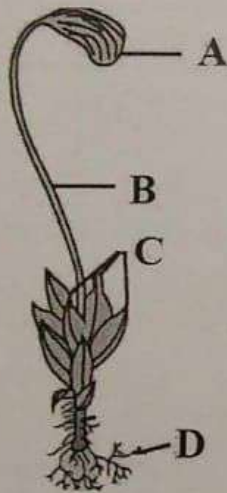
SECTION C

- 22 Compare the three classes of Kingdom Fungi on the basis of their mycelium and type of spores they form.
- 23 Study the graphs shown below for DNA content in a normally dividing cell till the division is completed. Answer the following questions. (C-denotes the content of DNA per cell)



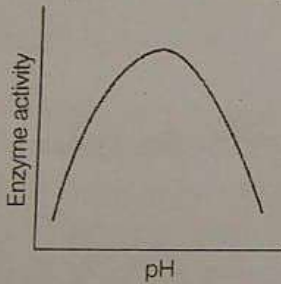
- (a) Identify the type of cell division depicted in A and B.
 (b) Which line segment represents the S phase. Justify.

- 24 In the plant figure shown below



- (a) Label the parts B, C and mention their ploidy.
 (b) State the functions of parts A and D.

- 25 Interpret the following graph giving one example from the working of your digestive system.



- 26 Algae can be photosynthetic, still it sometimes lives in symbiotic association. Justify the statement giving an example of symbiotic algae.

which is usually cited as an example of symbiosis' in plants where an algal and a fungal species live together for their mutual benefit. Which of the following will happen if algal and fungal partners are separated from each other?

- a. Both will survive and grow normally and independent from each other.
- b. Both will die.
- c. Algal component will survive while the fungal component will die.
- d. Fungal component will survive while the algal partner will die.

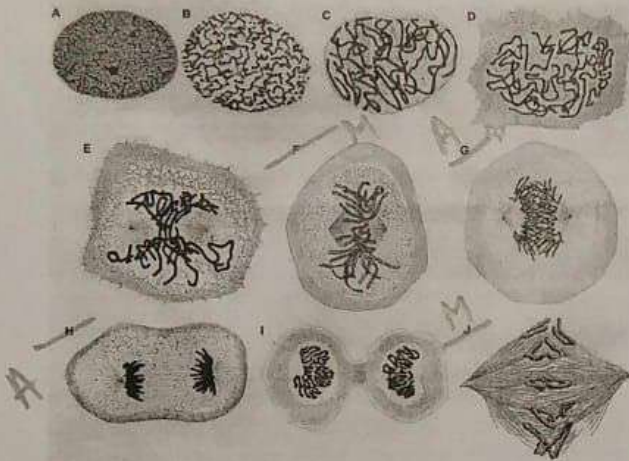
Based on your answer, how do you justify this association as symbiosis?

28 With reference to *Brassica campestris* linn.

- (a) Why is the scientific name written in italics?
- (b) How is it different when handwritten?
- (c) What do the first two words of the name indicate? ~~How is it different when handwritten?~~
- (d) What does "linn." mean?

SECTION D

29 (a) Identify anaphase and metaphase from the following micrographs:



(b) Give two points expressing the significance of meiosis and mitosis.

30 Proteins are polypeptide chains made up of amino acids. There are 22 types of amino acids joined together by peptide bonds when carboxylic groups of two amino acids: Essential and non-essential amino acids. The Primary structure of a protein is the linear sequence of amino acids in a polypeptide chain. The first amino acid of the enzyme is called a terminal amino acid and the last amino acid of the peptide is called C-terminal amino acid. The secondary structure of proteins forms a helix. There are three types of secondary structure: a helix, a pleated sheet and collagen triple helix. In tertiary structure long protein chain is folded upon itself like a hollow woollen ball to give a three-dimensional view of the protein. In quaternary structure, each polypeptide develops its own tertiary structure and functions as a subunit of protein.

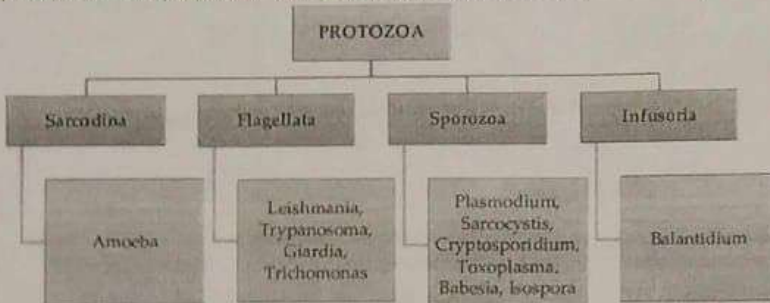
(a) Amino acids, as the name suggests, have both an amino group and a carboxyl group in their structure. In addition, all naturally occurring amino acids (those which are found in proteins) are called L-amino acids. Using the above information, write the name of the simplest amino acid. (1)

(b) Many organic substances are negatively charged e.g., acetate ion, while others are positively charged e.g., ammonium ion. Name such a form of amino acid which would have both positive and negative charges simultaneously in the same molecule. (1)

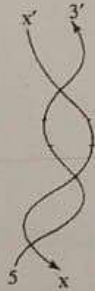
(c) Represent a chemical reaction between two amino acids to show the formation of a peptide bond. (2)

SECTION E

- 31 Read the text carefully and answer the questions:
 Sarcodines are unicellular/jelly-like protozoa found in fresh or sea water and in moist soil. Their body lacks a periplast. Therefore, they may be naked or covered by a calcareous shell. They usually lack flagella and have temporary protoplasmic outgrowths called pseudopodia. These pseudopodia or false feet help in movement and capturing prey. They include free-living forms such as Amoeba or parasitic forms such as Entamoeba. Zoo flagellates ciliates and I sporozoans are other groups of protozoan protists. They are all unicellular and heterotrophic. They may be holozoic, saprobic or parasitic.



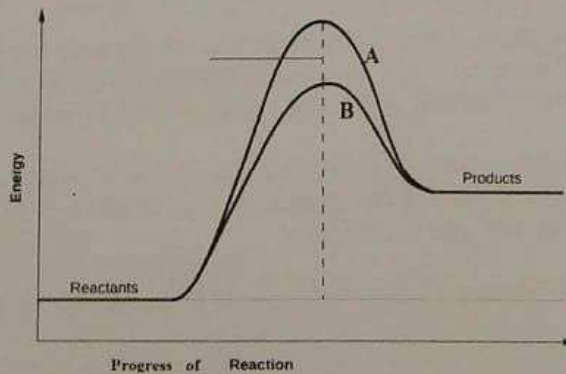
- (a) Give two diseases caused by protozoans.
 (b) Observe the given protozoan classification and discuss the basis of the above protozoan classification.
 (c) Name the locomotory structures present in protozoans.
- 32 (a) Give the polarity of x and x' in the line diagram of the DNA double helix given below.



- (b) If a DNA fragment has 800 bp in it, calculate the length of DNA. 272 (800 x 0.34)
 (c) If a DNA fragment of 1000 bp has 400 Adenine nitrogen bases, calculate the amount of Guanine, Thymine and Cytosine in it. 600
 (d) Give one structural difference in the building block of DNA and RNA.

OR

Observe the given graph showing a chemical reaction taking place in the presence and absence of an enzyme.



(6)

- (a) Based on energy level difference between substrate/reactant and product, identify the type of reaction.
- (b) Which of the two curves depicts the reaction catalyzed by enzymes? Give a reason.
- (c) If a chemical closely resembling the substrate is added to the reaction, which of the curves in the graph will be affected and why?
- 33 (a) Draw a well labeled diagram of cell stages showing the following:
(i) Chiasmata (ii) Anaphase - 1
- (b) Structure and function are correlatable in living organisms. Justify the statement by taking the plasma membrane as an example?