

4. Which among the following is incorrect about the layers of the cell wall?
- The cell wall is made of three main layers, namely, primary cell wall, secondary cell wall and middle lamella.
 - Cell wall of a young plant is made of primary cell which composes a loose network of cellulose microfibrils.
 - Secondary cell wall forms as the cell matures and composes cellulose and lignin.
 - Middle lamella separates cells and is composed of sodium.

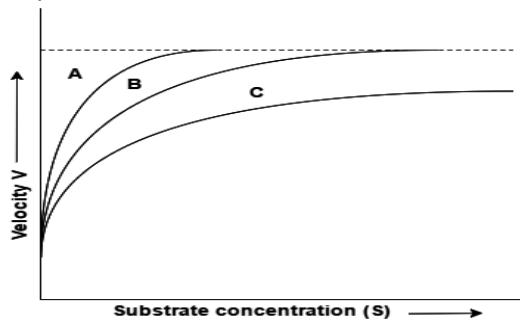
5. It is said that elemental composition of living organisms and that of inanimate objects (like earth's crust) are similar in the sense that all the major elements are present in both. Then what would be the difference between these two groups?
Choose the correct answer from the following.
- Living organisms have more gold in them than inanimate objects.
 - Living organisms have more water in their body than inanimate objects.
 - Living organisms have more carbon, oxygen and hydrogen per unit mass than inanimate objects.
 - Living organisms have more calcium in them than inanimate objects.

6. Match the columns and find out the correct combination

Column I	Column II
A. Starch	i. protein synthesis
B. hemoglobin	ii. sex hormone
C. RNA	iii. Storage product
D. Steroid	iv. transport of gases

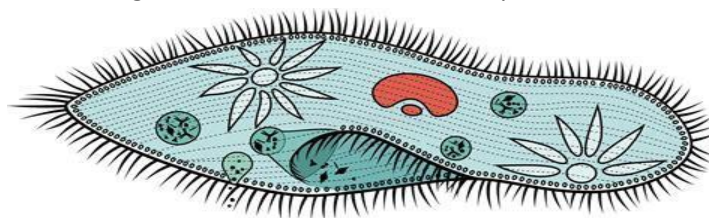
- A-i, B-iv, C-iii, D-ii
- A-ii, B-iv, C-i, D-iii,
- A-iii, B-iv, C-i, D-ii
- A-iv, B-iii, C-i, D-ii,

7. The figure given below shows three velocity - substrate concentration curves for an enzyme reaction. What do the curves depict?

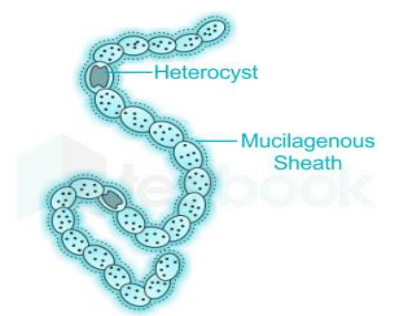


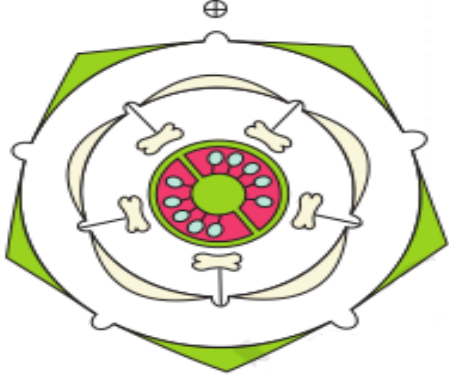
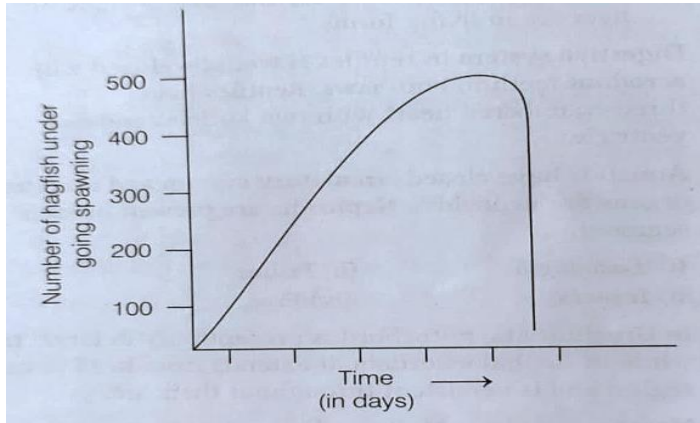
- A-normal enzyme action, B-competitive inhibition, C-noncompetitive inhibition
- A-enzyme with an allosteric modulator added, B-normal enzyme activity, C-competitive inhibition
- A-normal enzyme reaction, B-no competitive inhibitor added C-allosteric inhibitor added
- A-enzyme with an allosteric stimulator, B-competitive inhibitor added, C-normal enzyme reaction

8. Given below is the picture of an organism. Choose the incorrect option in relation to it.



- Eukaryote
- Presence of gullet
- Mode of nutrition is usually autotrophic
- Contain cilia

9.	<p>What is true about the mitotic spindle?</p> <p>a. It is composed of actin and myosin microfilaments.</p> <p>b. It includes the kinetochore at the metaphase plate.</p> <p>c. It is composed of microtubules, which separate chromosomes at opposite poles of the cell.</p> <p>d. It originates only from centrioles at the centrosomes.</p>	
10.	<p>The basic rule of taxonomy is</p> <p>I. A new taxon cannot be framed if the organism is different from the existing taxa.</p> <p>II. Organisms are described on the basis of morphology and other characteristics.</p> <p>Choose the correct option.</p> <p>a. Statement I is correct, but II is incorrect.</p> <p>b. Statement I is incorrect, but II is correct.</p> <p>c. Both statements I and II are correct.</p> <p>d. Both statements I and II are incorrect.</p>	1
11.	<p>The term systematics refers to:</p> <p>a. Identification and study of organ systems.</p> <p>b. Identification and preservation of plants and animals.</p> <p>c. Diversity of kinds of organisms and their relationship.</p> <p>d. Study of habitats of organisms and their classification.</p>	
12.	<p>Which of these structures protects the eyes of the frog in water?</p> <p>a. Nictitating membrane</p> <p>b. Tympanum</p> <p>c. Bidder's canal</p> <p>d. Cloaca</p>	
	<p>Question no 13 to 16 consists of two statements: Assertion and Reason. Answer these questions selecting the appropriate option</p> <p>a. Both A and R are true and R is the correct explanation of A.</p> <p>b. Both A and R are true and R is not the correct explanation of A.</p> <p>c. A is true but R is false.</p> <p>d. A is False but R is true</p>	
13.	<p>Assertion(A): The living organisms are regarded as open system.</p> <p>Reason(R): Energy of living organisms not be lost or gained from external environment.</p>	1
14.	<p>Assertion(A): In frog, the alimentary canal is short and length of intestine is reduced.</p> <p>Reason(R): Frog is carnivorous in nature.</p>	1
15.	<p>Given below is the diagram of an organism. Two statements are provided on the basis of the diagram. Comment on the appropriateness of the assertion and reason given below</p> <div style="text-align: center;">  </div> <p>Assertion(A): Nostoc are prokaryotic and are often grouped with bacteria. They are kept in cyanobacteria since, they are able to photosynthesize.</p> <p>Reason (R): These blue-green bacteria can tolerate adverse conditions very well as compared to other aquatic plants.</p>	1

16.	Assertion(A): Digested and semi-digested food is absorbed by the body surface of the tapeworms. Reason(R): Digestive organs are absent in tapeworms	
SECTION B		
17.	Identify the family that represent the floral diagram as shown below. Write the floral formula of the family. Mention the type of its inflorescence and give one economic importance.	2
		
18.	Cyanobacteria and heterotrophic bacteria have been clubbed together in Eubacteria of kingdom Monera as per the “Five Kingdom Classification” even though the two are vastly different from each other. Is this grouping of the two types of taxa in the same kingdom justified? If so, why?	2
19.	a. How is diversity in living world related to taxonomy? b. Brinjal and potato belong to the same genus <i>Solanum</i> , but they belong to two different species. What defines them as separate species?	2
20.	a. Given that the average duplication time of E.coli is 20 minutes, how much time will two E.coli cells take to become 32 cells? b. How cytokinesis varies in animal and plant cell?	2
21.	How do neutral solutes move across the plasma membrane? Can the polar molecules also move across it in the same way? If not, then how are these transported across the membrane? OR “Mitochondria is semi-autonomous organelle.” Give reason in support of the statement.	2
SECTION C		
22.	Study the graph of hagfish species in freshwater given below and answer the questions that follows:	3
		
<p>a. With reference to the above graph explain why there is a decline in hagfish population in freshwater?</p> <p>b. Which class of animal kingdom does hagfish belongs to? Explain in detail the structural characteristics of this organism.</p> <p>c. Give one point of difference between hagfish and flying fish.</p>		
23.	Draw the diagram of the leaf that contains bulliform cells. Mention the function of bulliform cells.	3
24.	a. The plant body in higher plants is well differentiated and well developed. Roots are the organs used for the purpose of absorption. What is the equivalent of roots in the less developed lower plants?	3

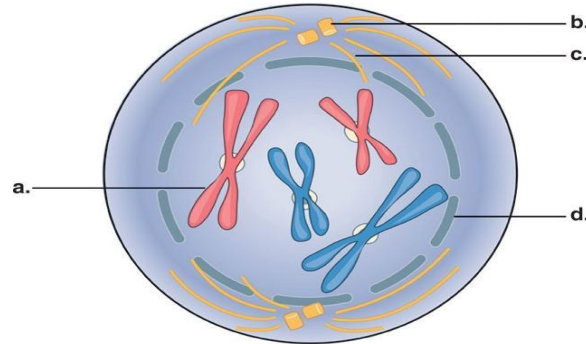
b. Heterospory, i.e. formation of two types of spores—microspores and megaspores is a characteristic feature in the life cycle of a few members of pteridophytes and all angiosperms. Explain how heterospory has evolutionary significance in plant kingdom?

OR

a. Each plant or group of plants has some phylogenetic significance in relation to evolution: Cycas, one of the few living members of gymnosperms is called as the 'relic of past'. Can you establish a phylogenetic relationship of Cycas with any other group of plants that justifies the above statement?

b. What role does vascular plants play in keeping the earth green? Which feature help them to dominate the earth?

25. Given below is a stage in mitosis of an animal cell.



a. Identify the stage and give reason for your answer.

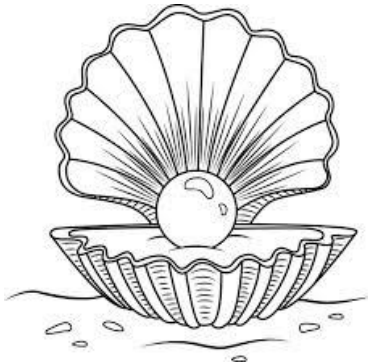
b. Name the stage that comes subsequent to this stage. Contrast the feature of this stage with the stage given in the above image.

c. Identify the parts labelled as a, b, c and d in the above diagram.

26. a. Explain the relation between the given images A and B.

b. The member of which kingdom is related to the product B?

c. Give the uses of the product shown in image B.



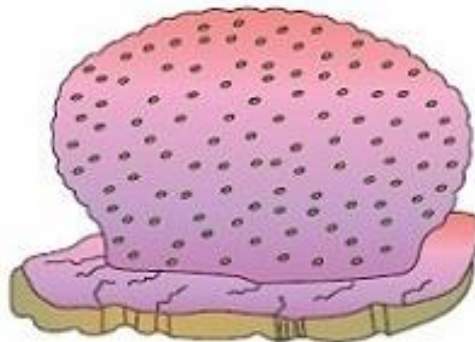
A



B

27. a. All vertebrates are termed chordates, but all chordates are not vertebrates. Justify the statement.

b. Mention the unique features of the organism shown below.

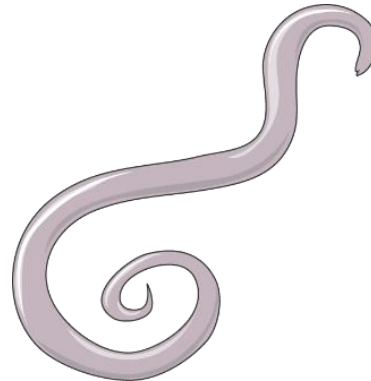


OR

- a. Mention two significant modifications in reptiles which are required for terrestrial mode of life.
b. Give two points of difference between the organisms A and B.



A



B

28. a. Why do fats release more energy than carbohydrates in the oxidation process?
b. Why do physicians recommend vegetable oils rich in polyunsaturated fat for persons suffering from cardiovascular diseases?
c. 'Tertiary structure is absolutely necessary for many biological activities of proteins.' Explain the statement.

3

SECTION D

Q29 and Q30 are case based questions. Each question has subparts with internal choice in one subpart

29. Read the following and answer the question that follows:

4

A biology teacher was explaining sexual reproduction in plants. She explained the method of double fertilisation. A student enquired about the fate of parts of a flower after fertilisation. The teacher replied "The fruit is a characteristic feature of the angiosperms. It is a mature or ripened ovary usually developed after fertilisation with a few exceptions. The ovules after fertilisation, develop into seeds. A seed is made up of a seed coat and an embryo. The embryo is made up of a radicle, an embryonal axis and one (as in wheat, maize) or two cotyledons (as in gram and pea). Generally, seeds are endospermic in monocotyledonous plants with few exceptions. In cereals like maize the seed coat is membranous and is fused with the fruit wall."



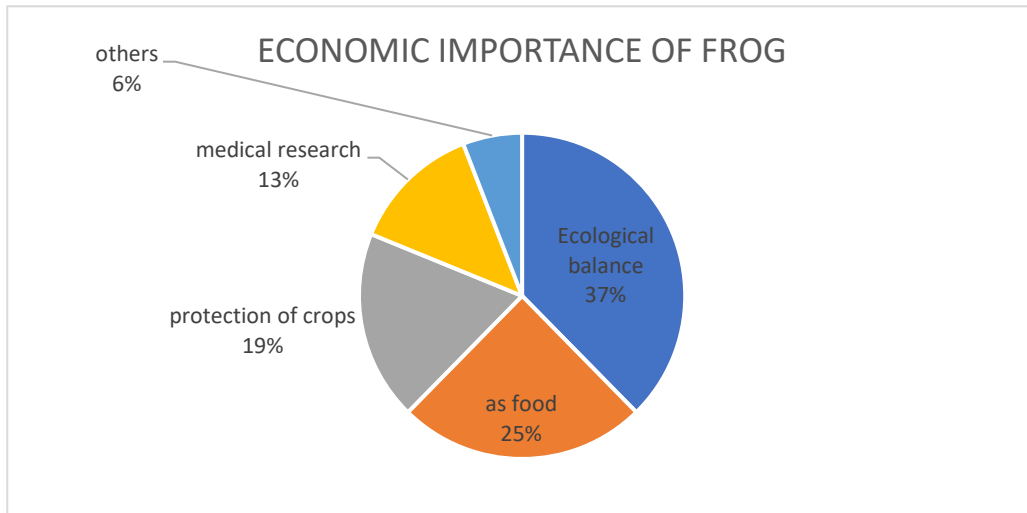
- a. What are parthenocarpic fruits?
b. Give an example of a monocot in which seed is non-endospermic.
c. 'Both mango and coconut is a drupe but they are different structurally.' Explain the statement.

OR

- c. Explain the structure of maize seed.

30. Given below is a pie chart showing various importance of frog. Answer the following questions based on the given pie chart.

4



- How does frog help in maintaining balance in the ecosystem?
- 'Frogs are not seen during peak summer and winter.' Give reason.
- Frogs are beneficial to mankind.' Explain the statement.

OR

- How can frogs of different sexes be identified morphologically?

SECTION E

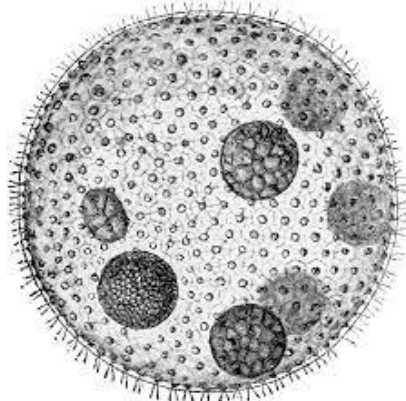
31. a. How does phylogenetic system of classification prove to be disadvantageous for plants?
b. Write a brief account of reproduction in algae.
c. Identify the pteridophyte shown below. Comment upon the fertilisation pattern of the pteridophyte.

5



OR

- Both gymnosperms and angiosperms bear seeds, then why are they classified separately?
- Comment upon the asexual reproduction seen in liverwort.
- Mention the class to which organism shown below belongs to. Comment upon the habitat, the major pigment present and the structure of chloroplast and cell wall of this organism.



32.	<p>a. Which cell organelle function as “segregation organelle”? Give reason to support your answer.</p> <p>b. Mention two functions of mesosomes.</p> <p>c. Illustrate the structure of mitochondria with a labelled diagram.</p> <p style="text-align: center;">OR</p> <p>a. What is the function of inclusion bodies in prokaryotic cells?</p> <p>b. Elaborate the function of satellite chromosome.</p> <p>c. Illustrate the structure of chloroplast with a labelled diagram.</p>	5
33.	<p>a. If you are told to cut a transverse section of the young stem of a plant from your school garden and observe it under a microscope, then how would you ascertain whether it is a monocot stem or a dicot stem? Give reasons for your answer.</p> <p>b. What is the stomatal apparatus? Draw a labelled diagram of the stomata.</p> <p style="text-align: center;">OR</p> <p>a. The cross-section of a plant material showed the following features when viewed under the microscope.</p> <p>i- The vascular bundles were radially arranged.</p> <p>ii. Four xylem strands with exarch condition of protoxylem.</p> <p>To which organ should it be assigned? How is this organ anatomically different from the same organ of maize?</p> <p>b. Why are the xylem and phloem called complex tissues? Diagrammatically represent the different arrangement of vascular bundles seen in different plant parts.</p>	5