



Delhi Public School, Howrah

FINAL EXAMINATION (2024-25)
CLASS XI

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

Subject: Biology (Code No. 044)

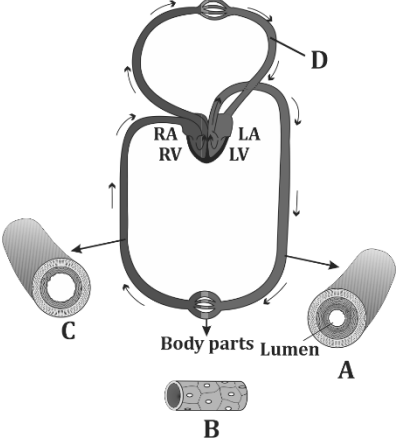
Time:- 3 Hours

F.M. - 70

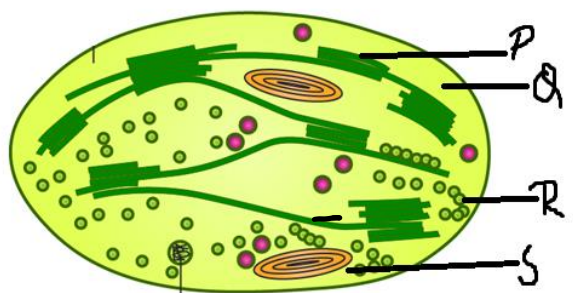
General Instructions:


1. All questions are compulsory.
2. The question paper has five sections: Section A, Section B, Section C, Section D and Section E. There are 33 questions in the question paper.
3. Section- 'A' has 16 questions containing MCQs and Assertion-Reasoning type questions of one 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; Section 'E' has 3 questions of 5 marks each.
4. There is no overall choice. However internal choice is provided in some questions. Students have to do any one of the alternatives.
5. Wherever necessary, neat and properly labelled diagrams should be drawn.

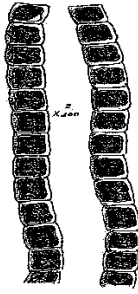

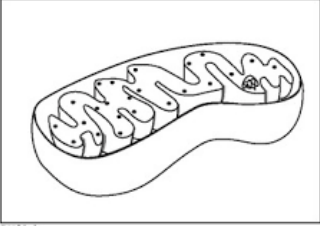
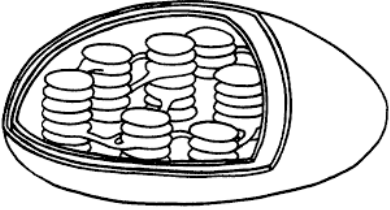

SECTION A

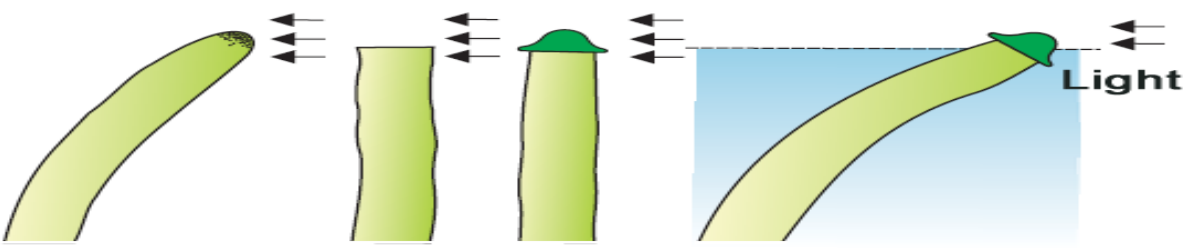
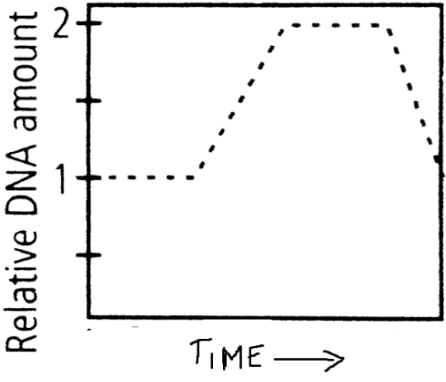
1.	Which one of the following is not a criterion for classification of fungi? a. Morphology of mycelium. b. Mode of nutrition. c. Mode of spore formation. d. Fruiting body.	1
2.	The skin of a frog serves multiple purposes. Which of the following adaptation helps the frog's skin function in respiration, and why is this important for its survival? a. Thick skin that prevents water loss. b. Presence of mucous glands that keep the skin moist. c. Pigmented skin that blends with the environment. d. Absence of blood vessels in the skin.	1
3.	The figure given below represents the double circulation found in humans. Choose the correct option that matches perfectly with the identification and function of the part labelled as A, B, C and D?  <p>The diagram illustrates the human double circulation system. It shows the heart with four chambers: Right Atrium (RA), Right Ventricle (RV), Left Atrium (LA), and Left Ventricle (LV). Arrows indicate the direction of blood flow. Part A is a vessel carrying blood from the lungs to the heart. Part B is a vessel carrying blood from the heart to the body parts. Part C is a vessel carrying blood from the body parts back to the heart. Part D is a vessel carrying blood from the heart to the lungs. Below the main diagram are four detailed views of blood vessels: A (pulmonary vein), B (capillary), C (vein), and D (artery).</p>	1

- a. B- Capillary-thin, with two celled thick wall carries deoxygenated blood.
- b. A- Pulmonary vein-takes oxygenated blood to heart.
- c. C- Vein-thin walled with blood flowing in jerks.
- d. D- Artery-thick walled with blood flowing slowly.

4.	<p>George comes on a vacation to India from US. The long journey disturbs his biological system and he suffers from jet lag. Which hormone is responsible for his discomfort?</p> <p>a. Adrenalin b. Vasopressin c. Melatonin d. PTH</p>											
5.	<p>In flatworms, excretion is carried out by flame cells. Which of the following best describes the function of flame cells?</p> <p>a. They store metabolic waste before excretion. b. They filter nitrogenous waste from the blood. c. They help maintain osmotic balance by excreting waste. d. They facilitate gas exchange by eliminating excess CO₂.</p>											
6.	<p>Match the columns and find out the correct combination</p> <table border="1"> <thead> <tr> <th>Column I</th> <th>Column II</th> </tr> </thead> <tbody> <tr> <td>A. Nucleolus</td> <td>i. Site of formation of glycolipid</td> </tr> <tr> <td>B. Centriole</td> <td>ii. Organization like cartwheel</td> </tr> <tr> <td>C. Leucoplast</td> <td>iii. Site for active ribosomal RNA synthesis</td> </tr> <tr> <td>D. Golgi Apparatus</td> <td>iv. For storing nutrients</td> </tr> </tbody> </table> <p>a. A-ii, B-i, C-iv, D-iii b. A-ii, B-i, C-iii, D-iv c. A-iii, B-iv, C-ii, D-i d. A-i, B-ii, C-iv, D-iii</p>	Column I	Column II	A. Nucleolus	i. Site of formation of glycolipid	B. Centriole	ii. Organization like cartwheel	C. Leucoplast	iii. Site for active ribosomal RNA synthesis	D. Golgi Apparatus	iv. For storing nutrients	1
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7.	<p>Ravi run a marathon race on a hot summer day. Which of the following changes can be found in the contents of fluids present in bladder?</p> <p>(I) The concentration of urea will increase. (II) A smaller volume of fluid is produced. (III) The amount of glucose will increase.</p> <p>a. I and II only d. I and III only c. II and III only d. I, II and III</p>	1										
8.	<p>From the given list of organisms select the number of organisms with radial symmetry.</p> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin: 10px auto; width: fit-content;"> <i>Physalis, Fasciola, Ascaris, Loligo, Pennatula</i> </div> <p>a.2 b.3 c.4 d.5</p>											
9.	<p>The diagram provided illustrates an electron micrograph of a chloroplast section. Where would the products of photophosphorylation be used?</p> <div style="text-align: center;">  </div> <p>a. P b. Q c. R d. S</p>											
10.	<p>If R.Q. is less than 1.0 in a respiratory metabolism, it would mean that</p> <p>a. Carbohydrates are used as respiratory substrate. b. Organic acids are used as respiratory substrate. c. The oxidation of the respiratory substrate consumed more oxygen than the amount of CO₂ released. d. The oxidation of the respiratory substrate consumed less oxygen than the amount of CO₂ released.</p>	1										

11.	The biological species concept defines species based on their ability to interbreed. Which of the following limitations is associated with this concept? a. It only applies to asexual organisms. b. It is only useful for studying extinct species. c. It focuses on the physical characteristics of organisms. d. It does not account for hybridization between different species.	
12.	A man is admitted to a hospital. He is suffering from an abnormal low body temperature, loss of appetite and intense thirst. The doctor consoled him and also prescribed brain scan as he suspected, there would be a tumour in his brain. Which part of the brain would probably show a tumour? a. Hypothalamus b. Thalamus c. Cerebral aqueduct d. Ventricles	
	Question no 13 to 16 consists of two statements: Assertion and Reason. Answer these questions selecting the appropriate option. a. Both A and R are true and R is the correct explanation of A. b. Both A and R are true but 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(A): Bulliform cells are useful in the unrolling of leaf. Reason(R): Bulliform cells store water.	1
14.	Assertion(A): In frog's vascular system, the composition of lymph is same as that of the blood. Reason(R): Lymph of frogs lack few proteins and RBCs.	1
15.	Assertion (A) The vasa recta is not present or highly diminishes in cortical nephron. Reason (R) The main concern of cortical nephron is urine concentration.	1
16.	Given below is the diagram that shows the vertebral column in humans. Two statements are provided on the basis of the diagram. Comment on the appropriateness of the assertion and reason given below  Assertion(A): Vertebral column extends from the base of the skull and constitutes the main framework of the trunk. Reason(R): The vertebral column protects the spinal cord, supports the head and serves as the point of attachment for the ribs and musculature of the back.	1
SECTION B		
17.	Attempt either option a or b a. Mango and coconut are 'drupe' type of fruits. In mango fleshy mesocarp is edible. What is the edible part of coconut? What does milk of tender coconut represent? OR b. "Maize grain usually called as a fruit and not a seed." Give two reason to support the statement.	2
18.	Attempt either option a or b a. A person had visited Delhi which is known for its polluted air. How will this affect his respiration? OR b. What are the major transport mechanisms for CO ₂ ? What is the effect of pCO ₂ on oxygen transport?	2
19.	Give reason for the following statements: a. Vitamins are not considered as plant growth hormones. b. Some plants belonging to halophytes and growing in marshy land face difficulty in seed germination.	2

20.	a. A teacher was teaching Animal kingdom to her students. She said there is an animal which is a connecting link between fishes and amphibians. Identify the animal and also mention the reason for being a connecting link.	2
21.	<p>Attempt either option a or b</p> <p>a. Two groups (A and B) of bean plants of similar size and same leaf area were placed in identical conditions. Group A was exposed to light of wavelength 400-450 nm and group B to the light of wavelength of 500-550 nm. Compare the photosynthetic rate of the two groups by giving reason.</p> <p style="text-align: center;">OR</p> <p>b. What can we conclude from the statement- 'The action and absorption spectra of photosynthesis overlap.'? At which wavelength, do they show peaks?</p>	2
SECTION C		
22.	<p>a. Name the major pigments in the following algae:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>A</p> </div> <div style="text-align: center;">  <p>B</p> </div> </div> <p>b. Bryophytes remain small sized and seldom attain great heights. Give reason. c. Differentiate between cytotoxicity and chemotaxonomy.</p>	3
23.	<p>Observe the given diagram and answer the following questions:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>X</p> </div> <div style="text-align: center;">  <p>Y</p> </div> </div> <p>a. Identify X and Y. How is X similar to Y? b. Mention two structural differences in both X and Y.</p>	3
24.	Schematically show the interrelationship among metabolic pathways showing respiration mediated breakdown of different organic molecules to CO ₂ and H ₂ O.	3
25.	<p>Given below is a conversation between two students of class X.</p> <div style="display: flex; justify-content: center; align-items: center;"> <div style="border: 1px solid green; border-radius: 50%; padding: 10px; margin-right: 20px; width: 250px;"> <p>I recently visited Bandhavgarh and saw a tiger.</p> </div> <div style="text-align: center;">  </div> <div style="border: 1px solid green; border-radius: 50%; padding: 10px; margin-left: 20px; width: 250px;"> <p>How wonderful. I saw <i>Panthera tigris</i> when I visited that place.</p> </div> </div> <p>a. Both of them are talking about a particular animal then why are the names different? Explain. b. Classification of organisms help in evolutionary pathway. How?</p>	3
26.	<p>a. How is Archaeobacteria different from other bacteria? b. Gamete formation and fusion are absent in bacteria. How do then bacteria undergo sexual reproduction? c. There is a myth that immediately after heavy rains, in forest, mushrooms appear in large number and make a very large ring or circle, which may be several metres in diameter. These are called as 'Fairy rings'. Explain this myth of fairy rings in biological terms?</p>	3

27.	<p>Given below is an image of an experiment performed which led to the discovery of a plant growth hormone. Answer the questions based on the understanding of the experiment.</p>  <p>a. Identify the hormone. Mention two physiological effects of the hormone. b. Explain the observation seen in the above experiment.</p>	3
28.	<p>a. Ravi was having a conversation with his friend. He said, "I use gingelly oil in winters but not coconut oil as it freezes easily." Justify the trueness of Ravi's statement. b. Why do lipids, whose molecular weights do not exceed 800 Da, come under acid insoluble fraction, i.e., macromolecular fraction? c. Mention a protein abundant in animal world and in whole of biosphere.</p>	3
SECTION D		
Q29 and Q30 are case based questions. Each question has subparts with internal choice in one subpart		
29.	<p>Read the paragraph given below and answer the following questions: Proteins are polypeptides. They are linear chains of amino acids linked by peptide bonds. Each protein is a polymer of amino acids. Amino acids can be essential or non-essential. The latter are those which our body can make, while we get essential amino acids through our diet/food. A patient suffers from a genetic disorder where certain proteins in his body do not fold correctly, leading to the accumulation of misfolded proteins in cells. This causes cellular damage and disrupts normal function.</p> <p>a. What is the importance of protein folding in cellular function? b. Enzymes are proteins that catalyse biochemical reactions. What happens to an enzyme's structure and function when it is exposed to high temperatures, and why?</p> <p>Attempt either subpart c or d</p> <p>c. The primary structure of a protein refers to the specific sequence of amino acids in a polypeptide chain. If one amino acid in a protein is replaced by another, how might this affect the protein's function?</p> <p style="text-align: center;">OR</p> <p>d. When cooking an egg, the egg white changes from a clear liquid to a white, solid form. What does this change represent in terms of protein structure, and why does it occur?</p>	4
30.	<p>A researcher is studying the cell cycle in rapidly dividing cells. During the experiment, they record the amount of DNA content in the cells at different time intervals. A graph is plotted, showing DNA content on the y-axis and time on the x-axis. The graph shows that the DNA content doubles during one phase, then remains constant for a longer period, and then halves in the subsequent phase.</p>  <p>a. Based on the description of the graph, which phase of the cell cycle corresponds to the DNA content doubling, and which phase corresponds to the halving of DNA content? b. Explain what the doubling and halving represent in the context of the cell cycle.</p>	4

	<p>Attempt either subpart c or d</p> <p>c. Between a prokaryote and a eukaryote, which cell has a shorter cell division time? Explain.</p> <p style="text-align: center;">OR</p> <p>d. A study examines the effect of temperature on the progression of the cell cycle. What can be inferred about the relationship between temperature and cell cycle progression?</p>	
	SECTION E	
31.	<p>Attempt either option a or b</p> <p>a. i. Mammals have the ability to produce a concentrated urine. Explain the process that allows it. ii. The functioning of the kidneys is efficiently monitored and regulated by hormonal feedback mechanisms. Explain the role of hormones in regulation of urinary system. iii. Differentiate between renal calculi and Glomerulonephritis.</p> <p style="text-align: center;">OR</p> <p>b. i. Describe the role of alcohol and caffeine in the concentration of urine. ii. How does tubular secretion help in maintaining ionic and acid-base balance in body fluids? iii. Discuss the regulation of kidney function by heart.</p>	5
32.	<p>Attempt either option a or b</p> <p>a. i. Explain the importance of saltatory conduction. ii. State the role of sodium potassium pump in the maintenance of ionic gradient. iii. Diagrammatically represent impulse conduction through an axon.</p> <p style="text-align: center;">OR</p> <p>b. i. Neural system and computers share certain common features. Comment. ii. Our reactions like aggressive behaviour, use of abusive words, restlessness etc. are regulated by brain. Name the parts involved. iii. Elucidate chemical transmission of nerve impulse with a diagram.</p>	5
33.	<p>Attempt either option a or b</p> <p>a. i. The cross-section of a plant material showed the following features when viewed under the microscope.</p> <ul style="list-style-type: none"> • The vascular bundles were radially arranged. • Four xylem strands with exarch condition of protoxylem. <p>To which organ should it be assigned? Draw the diagram of the organ.</p> <p>ii. Point out the differences in the anatomy of leaf of peepal (<i>Ficus religiosa</i>) and maize (<i>Zea mays</i>).</p> <p style="text-align: center;">OR</p> <p>b. i. A student observed a slide of a plant material. He observed that the cells arranged in multiple layers between epidermis and pericycle constitute the cortex. It consists of three sub-zones. A large number of vascular bundles are arranged in a ring. Identify the material and draw a labelled diagram. ii. Palm is a monocotyledonous plant, yet it increases in girth. Why and how?</p>	5