Indian School Al Wadi Al Kabir

Assessment – 2 (2025-2026)

Class: XI | Sub: Biology (044) | Max. Marks: 70

Date: 07/12/2025 | Set - II | Time: 3 Hours

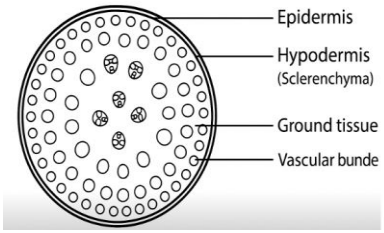
General Instructions:

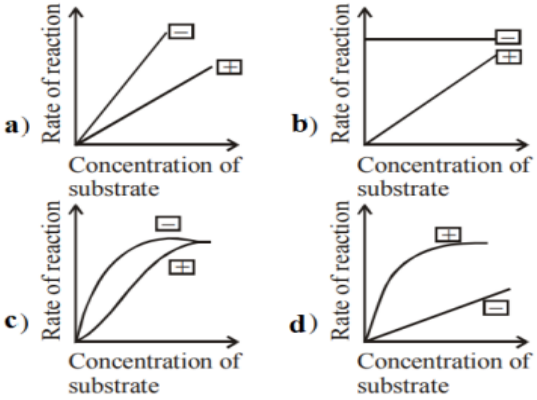
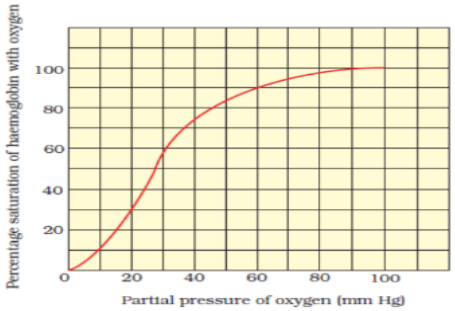
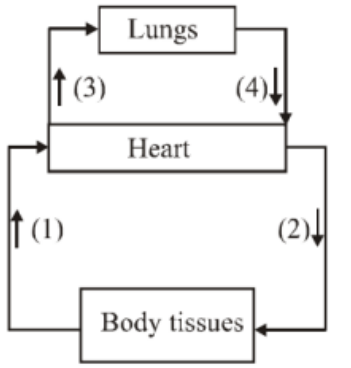
(i) All questions are compulsory.
The question paper has five sections and 33 questions. All questions are compulsory.

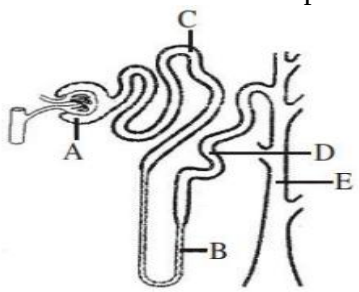
(ii) **Section A** has 16 questions of 1 mark each; **Section B** has 5 questions of 2 marks each; **Section C** has 7 questions of 3 marks each; **Section D** has 2 case-based questions of 4 marks each; and **Section E** has 3 questions of 5 marks each.

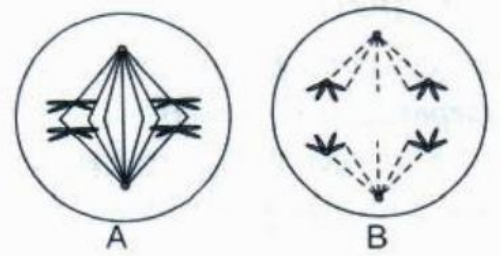
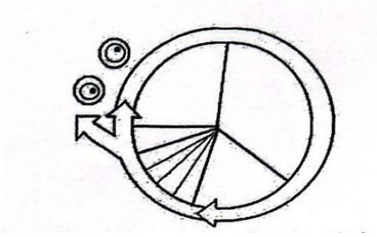
(iii) There is no overall choice. However, internal choices have been provided in some questions. A student must attempt only one of the alternatives in such questions.

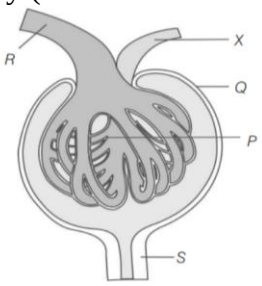
(iv) Wherever necessary, neat and properly labelled diagrams should be drawn.

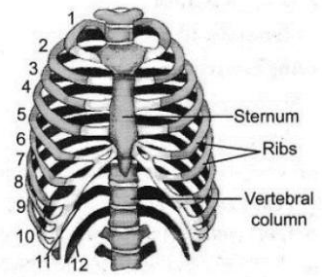
Section A		
Q. No	**Question**	**Marks**
1.	The vascular bundles shown in the diagram are:  A. Open and scattered B. Open and are in a ring C. Closed and scattered D. Closed and are in a ring	1
2.	The Casparian strips are found in: A. Cortex B. Endodermis C. Pericycle D. Phloem	1
3.	Frogs differ from humans in possessing A. Paired cerebral hemisphere B. Hepatic portal system C. Nucleated red blood cells D. Thyroid gland	1

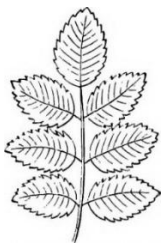
4.	Which of the following graphs correctly indicates the reaction in the presence (indicated by +) and absence (indicated as –) of an enzyme: -  A. a B. b C. c D. d	1
5.	A diploid cell has 20 chromosomes. It undergoes mitosis. What will be the chromosome number (N) and the DNA content (C) at metaphase? A. N=20, C=2C B. N=20, C=4C C. N=10, C=2C D. N=40, C=4C	1
6.	Which of the following factors favours the formation of oxyhaemoglobin in the lungs?  A. pO2 ↓, pCO2↑, H+↑, Temperature↑ B. pO2 ↑, pCO2↑, H+↓, Temperature↑ C. pO2 ↑, pCO2↓, H+↓, Temperature↓ D. pO2 ↓, pCO2↑, pH↑, Temperature↓	1
7.	The given figure represents the pathway of blood through the body: - Identify the correct match of marked numbers 1,2, 3 and 4.  	1

	A. 1-Artery B. 2-Pulmonary vein C. 3-Pulmonary Artery D. 4-Systemic Vein	
8.	The given figure represents a single nephron from a mammalian kidney. Identify the labelled parts, match them with the functions (i - iv) and select the correct option: - i. The site of ultrafiltration ii. Permeable to urea iii. The main site for the reabsorption of glucose and amino acids iv. Largely responsible for the maintenance of blood pH  A. i - A; ii - E; iii - C; iv - D B. i - A; ii - B; iii - C; iv - D C. i - A; ii - B; iii - C; iv – E D. i - A; ii - B; iii - D; iv - E	1
9.	Human adult vertebral formula is- A. C4 T8 L4 S8 C8 B. C7 T8 L5 S6 C7 C. C7 T12 L2 S1 C2 D. C7 T12 L5 S1 C1	1
10.	Hypersecretion of the prolactin hormone in females causes inappropriate lactation and absence of the menstrual cycle. Based on the information given, select the pair of correct statements. i. Prolactin is required for milk ejection from mammary glands. ii. The blood level of prolactin is increased just before menstruation. iii. During pregnancy, prolactin-inhibiting hormone suppresses the release of prolactin. iv. Sucking action of the newborn inhibits the release of PIH. A. i and ii B. ii and iii C. i and iii D. ii and iv	1
11.	Grey matter is mainly composed of: A. Myelinated axons B. Neuronal cell bodies C. Schwann cells D. Only dendrites	1
12.	GnRH secreted from the hypothalamus mainly stimulates the release of: A. Thyroxine from the thyroid gland B. Vasopressin from the posterior pituitary C. FSH and LH from the anterior pituitary D. Aldosterone from adrenals	1

	Question 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 (A):** In dicot roots, vascular bundles are radial and exarch. **Reason(R):** The protoxylem lies towards the periphery and the metaxylem towards the center.	1
14.	**Assertion(A):** The G1 phase of interphase is the most variable in duration among different cell types. **Reason (R):** It is the phase when the cell prepares for mitosis by duplicating its chromosomes.	1
15.	**Assertion(A):** The hepatic portal vein carries oxygenated blood from the liver to the heart. **Reason(R):** The hepatic portal vein collects blood rich in nutrients from the alimentary canal and carries it to the liver.	1
16.	**Assertion(A):** The functional unit of contraction of a muscle fibre is called a sarcomere. **Reason(R):** In the muscle fibre, the sarcomere is separated by the M line.	1
	Section-B	
17.	***Attempt either option A or B*** A. i. Name the stages and type of cell division represented in A and B, respectively.  ii. What are kinetochores? Give their function. **OR** B. The cell cycle is a highly regulated process that ensures the accurate replication and division of genetic material in cells. It consists of distinct phases, each playing a crucial role in cell growth and reproduction, as outlined in the diagram.  i. Name the two basic phases in the cell cycle. Which phase lasts for a longer duration? ii. Mention the significance of the S phase.	2
18.	***Attempt either option A or B*** A. All enzymes (except ribozymes) are proteins. An enzyme, like any other protein, has a primary, secondary and tertiary structure. The protein functions as an enzyme in its tertiary structure, where active sites are formed.	2

	i. What is the active site of an enzyme? ii. How are active sites formed? **OR** B. Explain competitive inhibition by giving an example.	
19.	Ram was an intelligent boy from Delhi who joined a coal mine as a manager in Jharkhand. He found that the working conditions there (in the factory) were not suitable. The workers were often unwell; some were even suffering from respiratory disorders that hindered their income as well as the work of the coal mine. Ram took the matter to the higher authorities and suggested some preventive measures regarding the health of the workers. The measures proved to be helpful. Soon, the workers' performance and attendance improved. i. What is the name of the above-described respiratory disease? ii. What are the preventive measures? iii. Give the symptoms and causes of these disorders.	2
20.	A diagram of the Malpighian body (also called renal corpuscle) is given below:  i. Identify and name the parts that collectively form the renal corpuscle. ii. Name two metabolic disorders which can be diagnosed by an analysis of urine.	2
21.	***Attempt either option A or B*** A. Neurons are excitable cells because their membranes are in a polarised state. How is the membrane of a neuron polarised? Explain. **OR** B. What happens when the membrane of a nerve cell carries out a sodium-potassium pump?	2
	Section-C	
22.	Identify the type of aestivation found in the following plants and diagrammatically represent each type. A. China rose B. Pea C. Calotropis	3
23.	Draw a neat diagram of the T.S. of a monocot root and label the following in it: Epidermis, Cortex, Pericycle, Xylem, Phloem and Endodermis	3
24.	In plants, the plastids which store the pigments are known as chromoplasts. A chloroplast is a chlorophyll-bearing chromoplast. Explain the ultrastructure of a chloroplast with the labelled diagram.	3
25.	A. Define oxygen dissociation curve. Can you suggest any reason for its sigmoidal pattern? B. How much air is left inside the lungs after a maximum forceful expiration in a healthy person?	3
26.	A diagram of a human rib cage is given. Observe the diagram and answer the following questions.	3

	 i. What are true ribs? How many true ribs are in the rib cage? ii. What is the role of the intercostal muscles and diaphragm in breathing?	
27.	Differentiate between each of the following. A. Ureotelism and uricotelism B. Tubular secretion and tubular reabsorption C. Ascending and descending limbs of Henle's loop	3
28.	A. What are meninges? Name the layers and write their function. B. Compare and contrast the conduction of nerve impulses in myelinated and non-myelinated neurons.	3
	Section-D	
29.	Systematics is a branch of science which deals with the study of classification, nomenclature, identification and evolutionary history of organisms. Linnaeus, also known as the father of taxonomy and published his book on *Systema Naturae*, where the classification of organisms is based on taxonomy. External and internal structure, along with the structure of the cell, the development process and the ecological information of organisms, are essential and form the basis of modern taxonomic studies. Classification is not a single-step process but involves a hierarchy of steps in which each step represents a rank or category. Since the category is a part of the overall taxonomic arrangement, it is called the taxonomic category, and all categories together constitute the taxonomic hierarchy. Each category, referred to as a unit of classification, in fact, represents a rank and is commonly termed a taxon. There are two types of names of organisms: one is vernacular common names, and another is scientific names. Scientific names are given according to certain rules and are followed by biologists all over the world. A. What is the basis of modern taxonomical studies? B. Illustrate the taxonomical hierarchy with suitable examples of a plant. *Attempt either subpart C or D.* C. Differentiate between taxonomy and systematics. **OR** D. Brinjal and potato both belong to the genus Solanum, yet they are classified as different species. What characteristics or criteria distinguish them as separate species?	4
30.	Blood plasma carries red blood cells, white blood cells and platelets to all the parts of the body. It also carries many solutes (dissolved substances)-these include oxygen, carbon dioxide, urea, hormones, glucose and amino acids in a normal healthy person. The number of white blood cells may vary, but is usually not more than 8000 per mm of blood. If a person has an infection, the number of white blood cells may rise to 40,000 per mm of blood.	4

	In a healthy person living at sea level, there are about 5,000,000 red blood cells per mm of blood. The cells are regularly replaced with bone marrow. Old, worn-out red blood cells are removed from the blood by the liver after about 120 days of carrying out their function. Each cell carries oxygen from the lungs to tissues, combined with a protein called haemoglobin. Haemoglobin will also combine with carbon monoxide, a gas in car exhaust fumes and cigarette smoke. Carbon monoxide combines with haemoglobin about 250 times more readily than oxygen does, and the combination does not break down. A. What percentage of oxygen and carbon dioxide are transported in the dissolved state through plasma? B. Name the two types of surface antigens present on the RBCs of humans, which decide the ABO blood characters. *Attempt either subpart C or D.* C. Name the two types of lymphocytes. How is their role different from basophils? **OR** D. Neutrophils and Eosinophils are granulocytes. How do they differ in function?	
Section-E		
31.	***Attempt either option A or B.*** A. Solanaceae is commonly called the potato family. i. Analyse the given floral formula and deduce the meaning of each element in it. $\oplus\ \male\ K_{(5)}\ \overset{\frown}{C_{(5)}\ A_5}\ \underline{G_{(2)}}$ ii. Draw a floral diagram to represent the given floral formula. iii. Write any two economic importance of the Solanaceae family, giving an example for each importance. **OR** B. i. Draw a neat, labelled diagram of the vertical section of a maize grain. ii. Seeds play a vital role in plant reproduction and vary greatly in their structure across species. Understanding the internal composition of seeds helps in studying their development and germination process. Castor seed is endospermic. Justify. iii. Two types of compound leaves are shown below:  A  B Identify the types of compound leaves and explain how they differ from each other.	5

32.	***Attempt either option A or B.*** A. i. Explain the mechanism of action of FSH with the help of a diagram. ii. Write the target cells/organs and the functions of the following hormones: a. Gastrin b. Secretin c. Cholecystokinin **OR** B. Insulin and glucagon help in glucose homeostasis in the blood i. Why is glucagon called a hyperglycemic hormone? Explain. ii. Name the target cells of the hormone insulin. iii. How do the two conditions, diabetes mellitus and diabetes insipidus, differ from each other?	5
33.	***Attempt either option A or B.*** A. i. Draw a diagram of the reproductive system of a male frog and label any four parts in it. ii. The digestive system of a frog is adapted to its carnivorous diet and unique lifestyle. The structure of the elementary canal and associated digestive organs plays a crucial role in the efficient processing of food. a) Why is the elementary canal of a frog short? b) Name the two accessory digestive glands. c) How is the absorption of digested food aided in the intestine of the frog? **OR** B. i. In frogs, the nervous system is highly developed, enabling precise control and coordination of various organ functions as well as interactions with endocrine glands. Describe the organisation of the nervous system and its major components in frogs. ii. Ureters function as urinogenital ducts in a male frog. Justify. iii. Describe the two special Venous connections in the circulatory system of a frog.	5