Indian School Al Wadi Al Kabir

Assessment – I (2025-2026)

Class: XI | Subject: Biology (044) | Max. marks: 70
Date: 21/09/2025 | Set- II | Time: 3 Hours

General Instructions:

(i) All questions are compulsory.

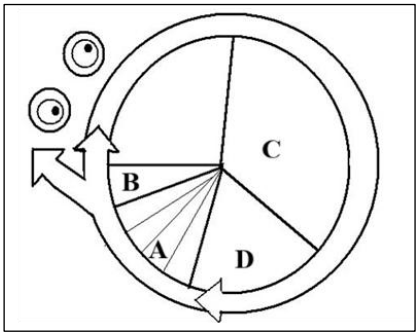
(ii) The question paper has five sections and 33 questions. All questions are compulsory.

(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. Answer all 33 questions. 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 labelled diagrams should be drawn.

Section A		
Q. No	**Question**	**Marks**
1.	Which among the following statements is incorrect about the plasma membrane? A. The plasma membrane is selectively permeable. B. Movement of gases and water takes place through diffusion and osmosis, respectively. C. Osmosis and diffusion are examples of active transport. D. Active transport takes place through the use of energy.	1
2.	What is true about ribosomes? A. The prokaryotic ribosomes are 80 S, where 'S' stands for sedimentation coefficient. B. These are composed of RNA and proteins. C. These are found only in eukaryotic cells. D. They are surrounded by a membrane.	1
3.	Name the most abundant protein in the animal world. A. Collagen B. Rubisco C. Chitin D. Inulin	1

4.	Given below is a schematic break-up of the phases of the cell cycle.  Which one of the following is the correct indication of the phase in the cell cycle? A. A-Cytokinesis B. B-Metaphase C. C- Synthesis phase D. D-G_1 Phase	1
5.	At the end of meiosis, four cells, each with 16 chromosomes, are formed. What would have been the number of chromosomes in the mother cell? A. 16 chromosomes B. 8 chromosomes C. 32 chromosomes D. 18 chromosomes	1
6.	Total lung capacity refers to: A. Total volume of air in the lungs after forceful inspiration. B. Volume of air that remains in the lungs after normal inspiration. C. Volume of air that remains in the lungs after forceful expiration. D. Volume of air inspired or expired.	1
7.	The incidence of Emphysema, a respiratory disorder, is high in cigarette smokers. In such cases: A. The diaphragm is found damaged. B. The alveolar walls are damaged. C. The trachea and bronchi are damaged. D. The respiratory muscles are damaged.	1
8.	When an injury occurs, which of the following sequences correctly describes the cascade of events that leads to the formation of a blood clot? A. Damaged tissue releases factors → Thrombokinase complex is formed → Inactive prothrombin is converted to active thrombin → Inactive fibrinogen is converted to insoluble fibrin. B. Damaged tissue releases factors → Inactive prothrombin is converted to active thrombin → Thrombokinase complex is formed → Inactive fibrinogen is converted to insoluble fibrin. C. Inactive prothrombin is converted to active thrombin → Damaged tissue releases factors → Inactive fibrinogen is converted to insoluble fibrin → Thrombokinase complex is formed. D. Inactive fibrinogen is converted to insoluble fibrin → Inactive prothrombin is	1

	converted to active thrombin → Damaged tissue releases factors → Thrombokinase complex is formed.	
9.	Which of the following sets has conditions that are indicative of diabetes mellitus? A. Ketonuria and uremia B. Glomerulonephritis and uremia C. Renal calculi and glycosuria D. Glycosuria and ketonuria	1
10.	Skeletal muscles are primarily controlled by: A. Sympathetic nerves B. Parasympathetic nerves C. Somatic nerves D. Autonomic nerves	1
11.	A person is suffering from an age-related disorder "X". X is characterised by decreased bone mass and increased chances of fractures. Identify X and its common cause. A. Tetany, increased levels of oestrogen. B. Osteoporosis, decreased levels of oestrogen. C. Myasthenia gravis, decreased levels of oestrogen. D. Muscular dystrophy, increased levels of oestrogen	1
12.	The correct arrangements of cranial meninges from outermost to innermost are: A. Pia mater, dura mater, arachnoid B. Arachnoid, dura mater, pia mater C. Pia mater, arachnoid, dura mater D. Dura mater, arachnoid, pia mater	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):** The movement of air into and out of the lungs is driven by creating a pressure gradient between the lungs and the atmosphere. **Reason (R):** Haemoglobin is the primary respiratory pigment responsible for transporting oxygen in the blood.	1
14.	**Assertion (A):** The lymphatic system drains the interstitial fluid back into the major veins. **Reason (R):** This prevents excessive accumulation of fluid in the tissues.	1
15.	**Assertion (A):** Vasa recta are well-developed in juxta medullary nephrons. **Reason (R):** The afferent arteriole of juxta medullary nephrons forms vasa recta parallel to the loop of Henle.	1
16.	**Assertion (A):** Inner parts of the cerebral hemisphere appear white. **Reason (R):** This is because the cell bodies of neurons are located in this area.	1

	Section-B	
17.	***Attempt either option A or B*** A. Why does the Golgi apparatus remain in close association with the endoplasmic reticulum? **OR** B. (i)What is meant by (9+2) organisation of axonemal microtubules in a cilium and flagellum? (ii) What are plasmids? State its significance.	2
18.	A. Represent diagrammatically a cell in the metaphase stage of mitosis. B. Enumerate the significance of mitosis.	2
19.	A. Proteins are heteropolymers containing strings of amino acids. Briefly describe the secondary and tertiary structure of proteins. B. How do temperature and pH affect enzyme-catalysed reaction?	2
20.	***Attempt either option A or B*** A. Draw the general structure of an amino acid in its zwitterionic form. **OR** B. Explain the function of oxidoreductases and isomerases.	2
21.	***Attempt either option A or B*** A. Name the bones that form the pelvic and pectoral girdles. What are the points for the articulation of the pelvic and pectoral girdles? **OR** B. Describe the fibrous joints and cartilaginous joints.	2
	Section-C	
22.	Explain the different types of plastids based on the types of pigments found in them. State the function of each.	3
23.	Describe the following phases of meiosis I. (i) Zygotene (ii) Pachytene (iii) Diplotene	3
24.	A. Starch reacts with iodine to give a blue black colour, but cellulose does not give blue black colour with iodine. Justify. B. Explain competitive inhibition along with an example.	3
25.	Name the layers of the diffusion membrane and explain how the thickness of each layer affects the process of diffusion. Support your answer with a neat, labelled diagram showing a cross-section of an alveolus with the associated pulmonary capillary.	3
26.	A. Draw a standard ECG and explain the different segments in it. B. How is the rate of heart beat determined from the ECG?	3
27.	Explain the mechanism of formation of concentrated urine in mammals.	3
28.	Describe in detail the structure of a sarcomere.	3

	Section-D	
29.	A person is undergoing intensive training for a marathon. As the workout intensity increases, the person's breathing becomes rapid and deep to meet the increased oxygen demand. During this period, the blood experiences a rise in carbon dioxide and hydrogen ion concentration. The person's neural system responds automatically, and this response is coordinated by several brain centres that work together to maintain the body's internal balance. A. Which part of the brain is primarily responsible for the regulation of respiration? (1) B. How does the pneumotaxic centre, influence the function of the respiratory rhythm centre? (2) ***Attempt either subpart C or D.*** C. Which substances activate the chemosensitive area in the brain, and what is the outcome? (1) **OR** D. What is the role of receptors located in the aortic arch and carotid artery in the regulation of breathing? (1)	4
30.	A 17-year-old student, Rohan, goes on a high-altitude trek without drinking enough water. Over the course of the day, he feels increasingly thirsty and tired. As a result of the excessive fluid loss and high altitude, his blood pressure drops. His body responds by activating its internal regulatory mechanisms. The regulation of kidney function is under neural and hormonal control. A. When do the osmoreceptors get activated? (1) B. What is the role played by Renin-Angiotensin in the regulation of kidney function? (2) ***Attempt either subpart C or D.*** C. What causes the release of ANF into the blood? Where is it released from?(1) **OR** D. How does ANF cause a decrease in blood pressure? (1)	4
	Section-E	
31.	***Attempt either option A or B.*** A. (i) Rh factor plays a significant role in child's birth born out of a marriage between Rh-negative woman and a Rh-positive man. Explain. (ii) What determines an individual's blood type in the ABO system? **OR** B. (i) Describe the events that occur during the ventricular systole and ventricular diastole. (ii) What is cardiac output? (iii) Why do we call our heart myogenic?	5

32.	***Attempt either option A or B.*** A. A muscle fibre is the anatomical unit of muscle. Explain in sequence the mechanism of muscle contraction using the sliding filament theory, and also support your answer with a neat and labelled diagram. **OR** B. (i) What is a motor unit? (ii) Describe the detailed structure of an actin fibre. (iii) How do muscles differ based on the myoglobin content? (two points)	5
33.	***Attempt either option A or B.*** A (i) Explain the role of Na^+ in the generation and conduction of an action potential. (ii)Draw a neat labelled diagram of a myelinated neuron. **OR** B. How does the transmission of a nerve impulse happen at a chemical synapse? Support your answer with a neat and labelled diagram.	5