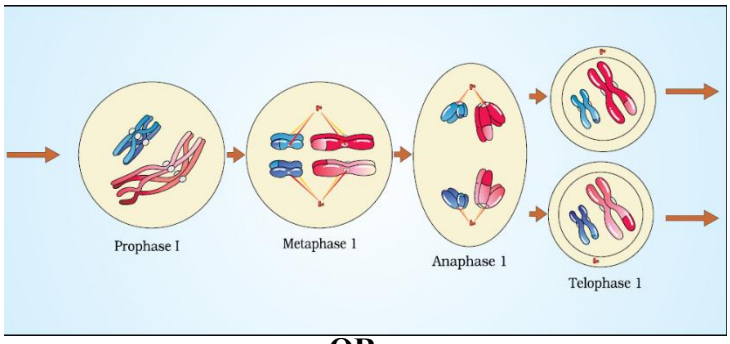
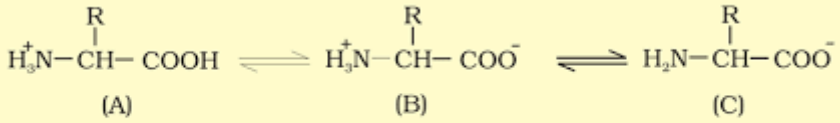
Indian School Al Wadi Al Kabir
Final Examination 2024-2025

Class: XI | Subject: Biology (044) | Max. marks: 70
Date: 02/03/2025 | SET-II | Time: 3 hours

Q.NO	ANSWERS	MARKS
	SECTION A	
1.	C. Osmosis and diffusion are examples of active transport	1
2.	B. Structure of cell wall	1
3.	B. Fused carpels	1
4.	D. Vascular bundle	1
5.	A. Conus arteriosus	1
6.	C. RuBisCO	1
7.	B. O_2	1
8.	B. Maximum growth	1
9.	A. Inflammation of bronchi and bronchioles	1
10.	C. Floating ribs	1
11.	D. Dura mater, arachnoid, pia mater	1
12	C. Production of glycogen	1
13.	a) Both A and R are true and R is the correct explanation of A	1
14.	a) Both A and R are true and R is the correct explanation of A	1
15.	b) Both A and R are true and R is not the correct explanation of A.	1
16.	c) A is false and R is true.	1
	SECTION B	

<table>
<tr><td>17.</td><td>A.
 

OR
B.
<table>
<tr><th>Cytokinesis in Plants</th><th>Cytokinesis in animals</th></tr>
<tr><td>1. In plant cells, wall formation starts in the centre of the cell and grows outward to meet the existing lateral walls.
2. Cell-plate is the precursor of cell wall which later forms middle lamella between two adjacent cells.</td><td>1. In an animal cell, this is achieved by the appearance of a furrow in the plasma membrane.
2. The furrow gradually deepens and ultimately joins in the centre dividing the cell cytoplasm into two.</td></tr>
</table></td><td>1+1

2</td></tr>
<tr><td>18.</td><td>A. Peptide bonds.
 

B is called zwitterionic form.
OR
B. -catalyse metabolic reactions
-every enzyme has an optimum pH and temperature for its action.
-they do not initiate but only accelerate the reaction.
-each is specific for a substrate and the reaction
-enzyme function by reducing the activation energy.</td><td>1+1

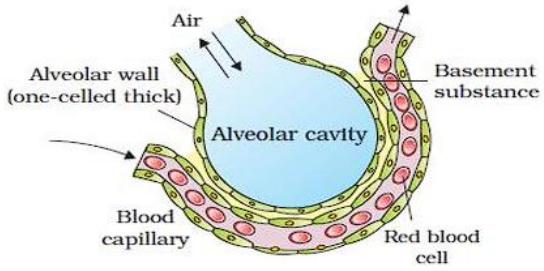
Any two</td></tr>
<tr><td>19.</td><td>A.*All the scientific names of organisms are usually Latin. Hence, they are written in italics.
*There exist two parts of a name. The first word identifies the genus and the second word identifies the species.
*When the names are handwritten, they are underlined or italicized if typed. This is done to specify its Latin origin.
*The name of the genus starts with a capital letter and the name of the species starts with a small letter.
B. It enables people from all over the world to communicate clearly about different plant and animal species. It also ensures that each scientific name is distinct.</td><td>1+1</td></tr>
<tr><td>20.</td><td>A. Asexual reproduction in liverworts takes place by fragmentation of thalli, or by the formation of specialised structures called gemmae (sing. gemma).</td><td>1+1</td></tr>
</table>

	Gemmae are green, multicellular, asexual buds, which develop in small receptacles called gemma cups located on the thalli. The gemmae become detached from the parent body and germinate to form new individuals. B. Bryophytes are considered amphibians of the plant kingdom because they depend on water for the movement of male gametes called antherozoids to reach archegonium for fertilization.	
21.	A. Param might have observed a snake. Three characters of reptiles are- i) These are creeping and burrowing terrestrial animals with scales on their body. ii) They are cold-blooded animals found in most of the warmer regions of the world. iii) The body is divided into head, neck, trunk, and tail. Reptilia- Lizard, Crocodile. OR B. In some animals, the body has many segments, which show serial repetition of parts. This kind of segmentation is called metameric segmentation, and the phenomenon is known as metamerism. E.g. Annelida	2 2
	Section-C	
22.	A. The arrangement of veins and veinlets in the leaf lamina is known as venation. There are two types of venations in leaf: Reticulate venation and Parallel venation. B. In alternate phyllotaxy, a single leaf arises from the node of a branch. This type of phyllotaxy is observed in the sunflower, mustard and peepal. Plants with opposite phyllotaxy have two leaves arising from the node in opposite directions. It is found in guava and jamun plants.	1+1+1
23.	A. (a) C_3 and C_4 pathways C_3 pathways / C_4 pathways 1. The primary acceptor of CO_2 is RUBP – a six-carbon compound. / 1. The primary acceptor of CO_2 is phosphoenol pyruvate – a threecarbon compound. 2. The first stable product is 3phosphoglycerate. / 2. The first stable product is oxaloacetic acid. 3. It occurs only in the mesophyll cells of the leaves. / 3. It occurs in the mesophyll and bundle-sheath cells of the leaves. 4. It is a slower process of carbon fixation and photo-respiratory losses are high. / 4. It is a faster process of carbon fixation and photo-respiratory losses are low. B. The rate of photosynthesis declines in the presence of continuous light because the breakdown of chlorophyll is caused by an increase in incident light above a certain point.	2+1
24.	Differentiation is the process where cells derived from meristems become specialized to perform specific functions. Dedifferentiation occurs when differentiated cells regain the capacity to divide under certain conditions. Redifferentiation is when dedifferentiated cells once again lose the capacity to divide and mature to perform specific functions. These processes are essential for plant growth, repair, and regeneration.	1+1+1

<table>
<tr><td>25.</td><td>A.
TABLE 15.1 Blood Groups and Donor Compatibility
<table><tr><th>Blood Group</th><th>Antigens on RBCs</th><th>Antibodies in Plasma</th><th>Donor's Group</th></tr><tr><td>A</td><td>A</td><td>anti-B</td><td>A, O</td></tr><tr><td>B</td><td>B</td><td>anti-A</td><td>B, O</td></tr><tr><td>AB</td><td>A, B</td><td>nil</td><td>AB, A, B, O</td></tr><tr><td>O</td><td>nil</td><td>anti-A, B</td><td>O</td></tr></table>
B. Rh compatibility is a major concern during pregnancy because if an Rh-negative mother carries an Rh-positive fetus, her immune system may produce antibodies against the fetal red blood cells. This could be fatal to the foetus or could cause severe anaemia and jaundice to the baby. This condition is called erythroblastosis foetalis. This can be avoided by administering anti-Rh antibodies to the mother immediately after the delivery of the first child.</td><td>2+1</td></tr>
<tr><td>26.</td><td>A (i)- Afferent arteriole, (ii)- Efferent arteriole, (iii)- Glomerulus, (iv)- Bowmans capsule.
B. Glomerular Filtration
Glomerular filtration occurs in the glomerulus where blood is filtered. This process occurs across the three layers- the epithelium of Bowman's capsule, the endothelium of glomerular blood vessels, and a membrane between these two layers.
Blood is filtered in such a way that all the constituents of the plasma reach the Bowman's capsule, except proteins. Therefore, this process is known as ultrafiltration.</td><td>2+1</td></tr>
<tr><td>27.</td><td>Initiation:
o The central nervous system (CNS) sends a signal through a motor neuron.
o The motor neuron releases the neurotransmitter acetylcholine at the neuromuscular junction and generates an action potential.
2. Calcium Release:
o The action potential spreads, triggering the sarcoplasmic reticulum to release calcium ions (Ca++) into the sarcoplasm.
3. Troponin Activation:
o Calcium binds to a subunit of troponin on the actin filaments and removes the masking effect of tropomyosin, exposing active sites on actin.
4. Cross-Bridge Formation:
o Myosin heads, powered by ATP hydrolysis, bind to the exposed active sites on actin, forming cross-bridges.
o The myosin heads rotate, pulling the actin filaments towards the center of the A band (thick filament region).
5. Sarcomere Shortening:
o The Z-lines (boundary of the sarcomere) are pulled inward, shortening the sarcomere and causing muscle contraction.
o During contraction:
□ The I-band (light band) shortens and the A-band (dark band) retains its length.
6. Cross-Bridge Detachment:</td><td>3</td></tr>
</table>

not to v

	o After ADP and inorganic phosphate (P1) are released, a new ATP molecule binds to the myosin head and causes the cross-bridge to break, and the myosin head returns to its relaxed state. 7. Repetition: o ATP is hydrolyzed, and the cycle of cross-bridge formation and detachment repeats as long as calcium is present. 8. Relaxation: o Calcium ions are pumped back into the sarcoplasmic reticulum, masking the actin active sites. o The Z-lines return to their original positions, and the muscle relaxes.	
28.	At a chemical synapse, the membranes of the pre- and post- synaptic neurons are separated by a fluid- filled space called synaptic cleft. Chemicals called neurotransmitters are involved in the transmission of impulses at these synapses. The axon terminals contain vesicles filled with these neurotransmitters. When an impulse (action potential) arrives at the axon terminal, it stimulates the movement of the synaptic vesicles towards the membrane where they fuse with the plasma membrane and burst to release their neurotransmitters in the synaptic cleft. The released neurotransmitters bind to their specific receptors, present on the post- synaptic membrane. This binding opens ion channels allowing the entry of ions which can generate a new potential in the post-synaptic neuron. The new potential developed may be either excitatory or inhibitory.	3
	Section-D	
29.	A. 'Lubb' the first sound which is low pitched, is caused by the closure of bicuspid and tricuspid valves. 'Dub' the second sound which is high pitched, is caused by the closure or semilunar valves B. Atrial contraction, ventricular contraction, and relaxation phases *Attempt either subpart C or D.* C. P wave, indicates atrial depolarization **OR** D. QRS complex, shows ventricular depolarization	1 2 1
30.	A. Uremia is condition where concentration of urea in blood is high. B. Blood drained from a artery is pumped into a dialysing unit after adding an anticoagulant like heparin. The unit contains a coiled cellophane tube surrounded by a fluid (dialysing fluid) having the same composition as that of plasma except the nitrogenous wastes. As nitrogenous wastes are absent in the dialysing fluid, these substances freely move out, thereby clearing the blood. The cleared blood is pumped back to the body through a vein after adding anti-heparin to it *Attempt either subpart C or D* C. Immunosuppressive drugs are prescribed to prevent rejection. D. Inflammation of glomeruli of kidney.	1 2 1

	SECTION E	
31.	*Attempt either option A or B.* A. (i) Figure 12.1 steps of glycolysis (ii) The RQ value for glucose is 1 while the RQ value. $$RQ = \frac{\text{volume of } CO_2 \text{ evolved}}{\text{volume of } O_2 \text{ consumed}}$$ **OR** B. (i) Figure 12.3 The Citric acid cycle Organic substrates that are oxidised during respiration to liberate energy inside the living cells are respiratory substrates. Carbohydrates, proteins, fats and organic acids are the most common respiratory substrate.	3+2 3+2
32.	A.(i) Squamous epithelium of alveoli, endothelium of alveolar capillaries and the basement substance. (ii) pressure/concentration gradient, solubility of gases, thickness of membranes involved. (iii)  **OR** **B.** (i) Inspiratory Reserve Volume (IRV): Additional volume of air, a person can inspire by a forcible inspiration. Expiratory Reserve Volume (ERV): Additional volume of air, a person can expire by a forcible expiration. (ii) Figure 14.1 from NCERT Human respiratory system	1+1+3 2+3
33.	A. (i) Growth hormone (GH), prolactin (PRL), thyroid stimulating hormone (TSH), adrenocorticotrophic hormone (ACTH) (ii) α-cells and β-cells. The α-cells secrete a hormone called glucagon, while the β-cells secrete insulin. (iii) Thymosins promote cell-mediated and humoral immunity. The thymus is degenerated in old individuals resulting in a decreased production of thymosins. As a result, the immune responses of old persons become weak. **OR** **B.** **(i)** Parathyroid gland regulates calcium and phosphate metabolism. It regulates the concentration of calcium ions. The role of the parathyroid	1+2+2 2+1+2

hormone is to increase the calcium level in the blood. Thus it acts on bone and stimulates the process of bone resorption, which is also called demineralisation and dissolution.

It also facilitates the reabsorption of calcium by renal tubules. This hormone increases calcium absorption from digested food and is a hypercalcemic hormone.

(ii) There are two types of hormone receptors namely membrane-bound receptors and intracellular receptors. Membrane-bound receptors are present on the surface of the target cells and intracellular receptors are present inside the nucleus of the target cell i.e. nuclear receptor.

(iii)

(f)		Diabetes mellitus	Dibetes insipidus
1.	Cause :	Due to insulin deficiency.	Due to antidiuretic hormone deficiency.
2.	Secretion of hormone :	By islets of Langerhans.	By posterior lobe of pituitary gland.
3.	Urination :	Slightly excssive	Excessive
4.	Blood :	Contains glucose in this case i.e. hyperglycaemia occurs.	No such symptom.
5.	Glucosuria :	Occurs.	Does not occur.