THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

Date :04/12/2024 **Grade:11**	**TERM-2 EXAM** **Biology (044)**	**Time : 3 Hours** **MARKS :70**

Qn. No		
	SECTION A	
1	It is known that exposure to carbon monoxide is harmful to animals because b. It reduces O_2 transport	1
2	The presence of ketone bodies is an indication of which of the following diseases? a) Diabetes mellitus	1
3	Select a limbless amphibian from the following : Ichthyophis	1
4	Naked cytoplasm, multinucleated and saprophytic are the characteristics of d. Slime molds	1
5	Mannitol is the stored food in c)Fucus	1
6	Which one of the following statements is incorrect? a. In cockroaches and prawns excretion of waste material occurs through malpighian tubules.	1
7	Respiratory process is regulated by certain specialised centres in the brain. One of the following centres can reduce the inspiratory duration upon stimulation b. Pneumotaxic centre	1

8	Algae have cell wall made up of; d)Cellulose, hemicelluloses & pectins	1
9	Birds and mammals share one of the following characteristics as a common feature. d. Warm blooded	1
10	Select the correct pair a. Arthropoda- silver fish	1
11	Cyanobacteria are classified under c. Monera	1
12	Match the column A with column B and choose the correct option Column I — Column II A. Porifera — i. Canal system B. Aschelminthes — ii. Water-vascular system C. Annelida — iii. Muscular pharynx D. Arthropoda — iv. Jointed appendages E. Echinodermata — v. Metameres a. A-ii, B-iii, C-v, D-iv, E-i	1

DIRECTION : Q. No. 13-16: Consist of two statements—
Assertion (A) and Reason (R).Answer these questions selecting the appropriate option given below:

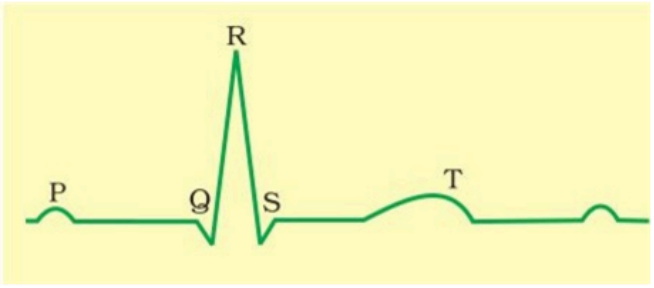
(a) Both A and R are true and R is the correct explanation of A.

(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 :Plant body is usually grass green in colour in Chlorophyceae. Reason :Members of Chlorophyceae possess chlorophyll a, c, carotenoids and xanthophyll. (a) Both A and R are true and R is the correct explanation of A.	1
14	Assertion: In ctenophores, digestion is chiefly extracellular. Reason: Digestive tract is incomplete in ctenophores. (a) Both A and R are true and R is the correct explanation of A.	1
15	Assertion (A) : A receptor is a specialized group of cells in a sense organ that perceive a particular type of stimulus. Reason (R) : Different sense organs have different receptors for detecting stimuli. (a) Both A and R are true and R is the correct explanation of A.	1
16	Assertion:Alveoli are the primary sites for exchange of gases. Reason:All factors in our body are favourable for diffusion of O2 from alveoli to tissues and that of CO2 from tissues to alveoli. (a) Both A and R are true and R is the correct explanation of A	1
	Section—B	
17	What is the principle underlying the use of cyanobacteria in agricultural fields for crop improvement? Cyanobacteria are used in agricultural crop improvement because of their adicity to fix atmospheric nitrogen and make it available to the plants. This improves the yield of the crops and also reduces the cost of application of nitrogen fertilisers.e.g., Anabaena and Nostoc	2
18	What is the difference between lymph and blood? lymph belongs to the lymphatic system. Blood contains pigments which carry oxygen. Therefore, blood can be found in different colors in different types of organisms. But, lymph is a colorless fluid. Blood is composed of red blood cells, white blood cells, platelets and a fluid called plasma. Lymph is composed of white blood cells and a watery fluid. Both blood and lymph possess a circulatory function as well as an immune function. The	2

	main difference between blood and plasma is that blood circulates inside blood vessels whereas lymph circulates inside lymphatic vessels.	
19	Endoparasites are found inside the host body. Mention the special structure, possessed by these and which enables them to survive in those conditions. Presence of adhesive organs for clinging on to the host. 2. High reproductive capacity 3. Loss of unnecessary sense organs. 4. They sometimes travel to another host so should have good adaption feature. 5. Loss of digestive system.	2
20	Draw a standard ECG and explain the different segments in it.  i. P wave - It represents the electrical excitation of the atria or the depolarisation of the atria. It represents the contraction of both the atria. ii. QRS complex - It represents the depolarisation of the ventricles which initiates the ventricular contraction. The contractions start shortly after Q and marks the beginning of the systole. iii. T- Wave - It represents the return of ventricles from excites to normal state (repolarisation). The end of the T- wave marks the end of systole.	2
21	In the five kingdom system of Whittaker, how many kingdoms are eukaryotes?Explain • Kingdom monera includes prokaryotic bacteria and BGA. • Kingdom protista includes unicellular eukaryotes. • Kingdom fungi includes multicellular eukaryotic fungi. • Kingdom plantae includes all multicellular eukaryotic plants and algae. • Kingdom animalia includes all multicellular eukaryotic animals.	2
Section—C		

22	Give the characteristic features of the following citing one example of each a. Chondrichthyes and osteichthyes Chondrichthyes- 1. They are also known as Elasmobranchii. 2. These types of fish are exclusively found in marine water. 3. The endoskeleton is made up of cartilage. 4. Some fishes undergo internal fertilization. 5. They are generally carnivores. Osteichthyes- 1. They are also known as teleostomi. 2. These types of fish are found in both marine and freshwater. 3. The endoskeleton is made up of bones. 4. Some fishes undergo external fertilization. 5. They are carnivores, omnivores, herbivores, etc.	3
23	Differentiate between a. Inspiratory and expiratory reserve volume b. Vital capacity and total lung capacity c. Emphysema and occupational respiratory disorder Difference between these are as follows (a) Inspiratory Reserve Volume: It is the additional volume of air, a person can inspire by a forcible inspiration. It ranges between 2500 mL to 3000 mL. Expiratory Reserve Volume: It is the additional volume of a expire by a forcible expiration. between 1000 mL to 1100 mL. (b) Vital Capacity: Vital capacity is the maximum volume of air that a person can breathe in after a forced expiration. This includes ERV, TV and IRV or the maximum volume of air a person can breathe out after a forced inspiration. i.e., Vc = ERV + IRV + TV Total Lung Capacity: Total using capacity is the total v accommodated in the lungs at the forced inspiration. This includes R and IRV or vital capacity + residu i.e., TLC = RV + (ERV + IRV + TV) (c) Emphysema: Emphysema is a chronic disorder of respiratory system, in which alveolar cells are damaged due to which regulatory respiratory surface is decreased. Cause of emphysema is cigarette smoking. Occupational Respiratory Disorde: It is caused due to the long expos produced by stone grinding or br give rise to inflammation leading and thus causing serious lung dan protective masks are provided fo worker in such industries.	3
24	Write the differences between: (a) Actin and Myosin (b) Red and White muscles	3

(c) Pectoral and Pelvic girdle

(a) Actin and Myosin

	Actin		Myosin
1	Actin is a thin contractile protein.	1	Myosin is a thick contractile protein.
2.	It is present in light bands and is called an isotropic band.	2	It is present in dark bands and is called an anisotropic band.

(b) Red and White muscles

	Red muscle fibre		White muscle fibre
1	Red muscle fibres are thin and smaller in size.	1	White muscle fibres are thick and larger in size.
2	They are red in colour as they contain large amounts of myoglobin.	2	They are white in colour as they contain small amounts of myoglobin
3	They contain numerous mitochondria.	3	They contain less number of mitochondria.
4	They carry out slow and sustained contractions for a long period.	4	They carry out fast work for short duration.
5	They provide energy by aerobic respiration.	5	They provide energy by anaerobic respiration.

(c) Pectoral and Pelvic girdle

	Pectoral girdle		Pelvic girdle
1	It is a skeletal support from where the forelimbs of vertebrates are attached.	1	It is a skeletal support form where the hind limbs of vertebrates are attached.
2	It is composed of two Bones namely, clavicle or collar bones and scapula or shoulder bone.	2	It is composed of three bones, upper ileum, inner pubic, and ischium.

25	How useful is the study of the nature of body cavity and coelom in the classification of animals? Coelom is a fluid filled space between the body wall and digestive tract. The presence or absence of body cavity or coelom plays a very important role in the classification of animals. Animals that possess a fluid filled cavity between body wall and digestive tract are known as coelomates. Annelids, mollusks, arthropods, echinodermates, and chordates are examples of coelomates. On the other hand, the animals in which the body cavity is not lined by mesoderm are known as pseudocoelomates. In such animals, mesoderm is scattered in between ectoderm and endoderm. Aschelminthes is an example of pseudocoelomates. In certain animals, the body cavity is absent. They are known as acoelomates. An example of acoelomates is platyhelminthes.	3

26	During resting potential, the axonal membrane is polarised. Explain the movement of positive and negative ions leading to polarisation. Resting membrane potential arises due to • Permeability of the plasma membrane of the axon- The plasma membrane is more permeable to K^+ ion than Na^+ ion as the membrane has more potassium ions leakage channels than sodium leakage channels. More K^+ ions move outside the membrane as compared to the inward transport of Na^+ ions. As more K^+ ions exit, the charge inside the membrane becomes more negative than the extracellular fluid. • The anions cannot follow the K^+out of the cell because they are attached to non-diffusible molecules such as ATP and large proteins. • Sodium potassium pump helps in maintaining the resting membrane potential by exporting three Na^+ ions and importing two K^+ ion. These pumps move more positive charge from the cell than they bring into the cell, so they contribute to the negative charge of the resting membrane potential.	3
27	Describe the role of the neural system in controlling respiration.	3
28	Name the type of joint between the following: (a) atlas/axis (b) carpal/metacarpal of thumb (c) between phalanges (d) femur/acetabulum (e) between cranial bones (f) between pubic bones in the pelvic girdle	3
	Section—D	
29	**Read the following and answer any four questions:** Exchange of gases also occurs between blood and tissues. O2 and CO2 are exchanged in these sites by simple diffusion mainly based on pressure/concentration gradient. The solubility of the gases, as well as the thickness of the membranes involved in diffusion, are also some important factors that can affect the rate of diffusion.	4

	1.Pressure contributed by an individual gas in a mixture of gases is called _____. a)Atmospheric pressure b) Differential pressure c)Capillary pressure d) Partial pressure 2._____ are the primary sites of exchange of gases. a)Alveoli b)Trachea c)Diaphragm d) Bronchi 3.The diffusion membrane is made up of _____ major layers. a)Two b) Three c)Four d) Five 4.What are the values of pO2 and pCO2 in the body tissues? a) pO2 – 104 mm Hg, pCO2 – 40 mm Hg b)pO2 – 104 mm Hg, pCO2 – 140 mm Hg c)pO2 – 95 mm Hg, pCO2 – 40 mm Hg d)pO2 – 40 mm Hg, pCO2 – 45 mm Hg	
30	**Read the following and answer any four questions:** Amphibians are the first tetrapods to invade the land. The juvenile phase of the life cycle is dependent on water, where gas exchange occurs through gills. Amphibians have aquatic larval life and terrestrial adult life. Respiration is by gills, lungs and skin.Their body is divisible into head and trunk and skin is moist without scales. The two pairs of limbs are used for locomotion except for caecilians. They are cold- blooded animals. Respiration is by gills (in larva); lungs and skin (in adults). Amphibians have a three-chambered heart. Fertilisation is external. However, in Salamander and Ichthyophis fertilisation is internal. They are mostly oviparous, except for salamanders, which are viviparous. Development is indirect. (i) Amphibians are cold- blooded animals hence, they are called animals.	4

	(a) Homeothermic (b) Homoiothermic (c) Poikilotherms (d) Homothermic (ii) All amphibians use two pairs of limbs for locomotion, however, it is a limbless amphibia. (a) Bufa (b) Salamandra (c) Hyla (d) Ichthyophis iii)Neck is not found in a frog. This absence helps the frog to (a) swim in water (b) respire (c) catch prey (d) jump on ground vi)Even after attaining sexual maturity, larval characters are retained. It is known as (a) Phylogenesis (b) Neoteny (c) Parthenogenesis (d) Ontogenesis	
SECTION-E		
31	Biological classification is a dynamic and ever evolving phenomenon which keeps changing with our understanding of life forms. Justify the statement taking any two examples Or What are the characteristic features of euglenoids? Some characteristic features of Euglenoids are as follows. - Euglenoids (such as Euglena) are unicellular protists commonly found in fresh water. - Instead of cell wall, a protein-rich cell membrane known as pellicle is present. - They bear two flagella on the anterior end of the body. - A small light sensitive eye spot is present. - They contain photosynthetic pigments such as chlorophyll and can thus prepare their own food. However, in absence of light, they behave similar to heterotrophs by capturing other small aquatic organisms. - They have both plant and animal-like features, which makes them difficult to classify.	5
32	Give a brief account of the countercurrent mechanism The counter current mechanism operating inside the kidney is the main adaptation for the conservation of water. There are two counter current mechanisms inside the kidneys. They are Henle's loop and vasa rectae. Henle's loop is a U-shaped part of the nephron. Blood flows in the two limbs of the tube in opposite directions and this gives rise to counter currents. The Vasa recta is an efferent arteriole, which forms a capillary	5

	network around the tubules inside the renal medulla. It runs parallel to Henley's loop and is U-shaped. Blood flows in opposite directions in the two limbs of vasa recta. As a result, blood entering the renal medulla in the descending limb comes in close contact with the outgoing blood in the ascending limb. or a)Define oxygen dissociation curve. Can you suggest any reason for its sigmoidal pattern? 1. The oxygen dissociation curve is a graph which shows the relationship between the partial pressure of oxygen and oxygen saturation of haemoglobin. 2. The oxygen dissociation curve is a graph describing the saturation percentage of oxyhaemoglobin at various partial pressures of oxygen. 3. This curve also shows the equilibrium of haemoglobin and oxyhaemoglobin at various partial pressures. b) Explain the role of Haemoglobin for the transport of O2? The amount of oxygen bound to the hemoglobin at any time is related to the partial pressure of oxygen to which the hemoglobin is exposed. In the lungs, at the alveolar-capillary interface, the partial pressure of oxygen is high, and therefore the oxygen binds readily to hemoglobin. As the blood circulates to other body tissue in which the partial pressure of oxygen is less, the hemoglobin releases the oxygen into the tissue because the hemoglobin cannot maintain its full bound capacity of oxygen in the presence of lower oxygen partial pressures. Red blood cells in the blood are flattened disc like structures responsible of transporting oxygen and carbon dioxide gases. Red blood cells consist of red iron-containing pigment called as haemoglobin. Haemoglobin is a respiratory pigment that carries oxygen through red blood cells. Oxygenated blood is carried to tissues. The exchange of gases at tissue level is called as peripheral gas exchange. The capillaries of circulatory system deliver the oxygen rich blood to the tissues of the body. This oxygen diffuses across the walls of the capillaries into tissues. In turn carbon dioxide diffuses into the blood from tissues. The carbon dioxide diffused into the blood binds to haemoglobin present in the blood to form carboxyhaemoglobin. This de-oxygenated blood is carried to lungs for purification. In the lungs, carbon dioxide from carboxyhaemoglobin dissociates leaving behind haemoglobin. The cycle continues to cary oxygen from lungs to tissues and carbon dioxide from tissues to lungs by haemoglobin	
33	What are the modifications that are observed in birds that help them fly? Birds have undergone many structural adaptations to suit their aerial life. Some of these adaptations are as follows. ● Streamlined body for rapid and smooth movement. Vertical air movements help the bird with gliding and soaring in the air.	5

	• Covering of feathers for insulation. • Forelimbs are modified into wings and hind limbs used for walking, perching, and swimming. • The presence of pneumatic bones reduces weight. • They have a higher metabolic rate that provides the energy for flight. • Presence of additional air sacs to supplement respiration. • The sternum is modified into a keel for the attachment of large, powerful flight muscles.	