Parvatibai Chowgule College of Arts and Science
Autonomous

B.Sc. Online Semester End Examination, January/February 2022

Semester: 3
Subject: Zoology
Paper: Human Physiology (Core)
Duration: 2 Hours Max. Marks: 45

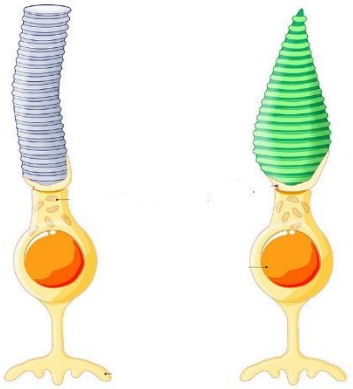
Instructions: *1. All questions are compulsory*
2. Figures to the right indicate full marks
3. Draw diagrams wherever necessary

Q.1. Answer <u>ANY THREE</u> of the following: **(09)**

a) A woman shows symptoms like weakness, irregular heartbeats and shortness of breath. The doctor advised the woman to do a test to check the level of respiratory pigment in the blood. Identify and describe the respiratory pigment mentioned above. What could be the possible disease the woman is suffering from?

b) The contraction and relaxation of diaphragm and inter costal muscles are controlled by a respiratory center 'A'. Identify and explain the mechanism of 'A'.

c) Identify and differentiate between the two photoreceptors given in the image below. How will the vision be altered in case of damaged photoreceptors.



A B

d) A type of reflex 'X' controls muscle stretching and preventing it from getting torn. Identify and explain the operation of reflex 'X'.

Q.2. Answer <u>ANY TWO</u> of the following: **(12)**

a) the structure of hemoglobin obtained from venous blood showed only two oxygen molecules bound to it whereas the hemoglobin structure of the blood obtained from the pulmonary vein showed four molecules of oxygen bound to it. Justify. The oxygen dissociation curve when influenced by various factors results in right or left shift in the curve. Explain these factors influencing the shift in the curve with the help of a graph.

b) Hyperactivity of hypothalamus results in over secretion of hormone ADH. Explain the relationship between the condition mentioned above and the urine production. How will the urine production differ in case of hyposecretion of ADH? Add a note on significance of ions in tubular reabsorption.

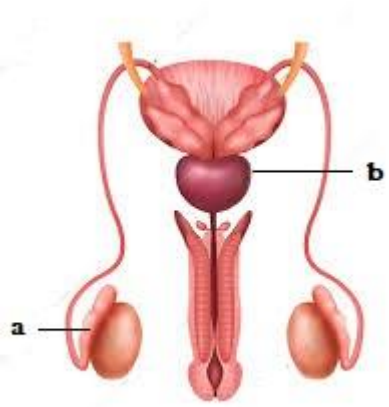
c) Ankita was observing different cells under the microscope as a part of her human physiology practical. She noticed that the appearance of the skeletal muscles differed from digestive tract muscles. Identify and describe the type of cells seen in skeletal muscles and digestive tract. Add a note on the ultrastructure of skeletal muscle.

Q.3. Answer <u>ANY TWO</u> of the following: **(12)**

a) Kidneys are abundantly supplied with a network of blood vessels that help in the removal of nitrogenous wastes from the body. Identify and describe the process mentioned above with the help of a neat labeled diagram.

b) An action potential was generated on a nerve fiber by threshold electrical stimulus. When the second stimulus was applied during the refractory period, it was unable to generate the second action potential. Explain. How are electrical impulses generated in a nerve fiber? In which direction will the nerve impulse propagate if a nerve fiber is stimulated in the middle of the axon?

c) Identify and explain the role of ‘a’ and ‘b’ from the image given below. labeled part and explain its role in the system. Describe the maturation process of primary spermatocyte into spermatozoa. If sperms are obtained from the testis, will they be able to fertilize the ovum? Justify your answer.



Q.4. Answer <u>ANY ONE</u> of the following: **(12)**

X)

i) A disease of a digestive system causes diarrhea and constipation is occurs due to changes in by a specific part of digestive system. Identify and explain. Add a note on it role in digestion.

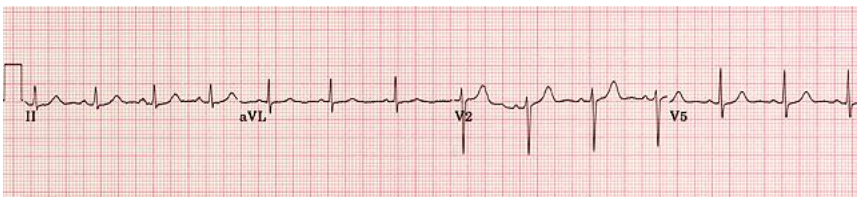
ii) Enzymes secreted by the pancreas are unable to aid in digestion until they are activated. Identify the enzymes and explain its activation process. Describe the role of these enzymes in digestion.

<u>OR</u>

Y)

i) Hapetitis C is a viral infection that causes liver inflammation, sometime leading to serious lever damage. How will this disease affect on the formation blood cells? Explain the process of formation of formed elements from a single pluripotent stem cell.

ii) A woman experiencing chest pain was prescribed to measure the electrical activity of the heart. The graph given below was obtained during the test. Identify the graph and explain its different segments. How are these segments generated. Autorhythmicity in a heart is caused by pacemaker cells. Explain.



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