2013

ZOOLOGY

(Major)

Paper : 5.1

(Animal Physiology)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Give short answers to the following : 1×7=7

(a) Name the component of bile that greatly enhances the emulsification of fat and stabilizes the emulsion.

(b) State the role of the protein titin in sarcomere.

(c) Name the protein which is responsible for exchange of bicarbonate ions and chloride ions across the membrane of RBC.

(d) Give example of an ectopic pacemaker of heart.

(e) Mention the nitrogenous waste which is obtained from nucleic acid metabolism.

(f) Write the Goldmann's equation on the resting membrane potential in relation to permeability of different ions.

(g) Mention the respiratory pigment in the blood of squid and name the metallic atom that forms this pigment.

2. Answer the following questions briefly : 2×4=8

(a) Write how the anadromous and catadromous fishes cope osmotically with changing salt and ionic concentration during their migration.

(b) Give at least four important conditions that are responsible for right shifting of the oxygen dissociation curve.

(c) Name the most important hormonal factor necessary for development and maturation of red blood corpuscles. State the source of this hormone.

(d) What are different subunits of the muscle protein troponin? Indicate their attachment with other contractile components.

TnT, TnC TnI

3. Answer any *three* questions from the following : 5×3=15

(a) Explain the structural coordination between the nerve endings and the skeletal and smooth muscle fibres. 5

(b) Give one example of animal each having myogenic heart and neurogenic heart. Write at least four differences between these two types of heart. Mention the group of invertebrate possessing chambered heart. 2+2+1=5

(c) Explain how the osmoregulatory mechanism in vertebrates is influenced by hormones. 5

(d) Give an account of the role of liver in digestion, excretion and metabolism in the body. 5

(e) What are different types of blood pressures? Name the instrument by which blood pressure is measured. Write how human blood pressure varies diurnally and with age of individual. 2+1+2=5

4. Describe how the nervous and hormonal factors regulate the process of digestion in human stomach and intestine in coordinated manner. 10

Or

In breathing, inspiration is an active process. Justify. Illustrate the neural mechanism of control of breathing in mammals. 2+8=10

5. What are the chemical components involved in contraction of muscles? Explain different steps of chemical events leading to contraction of muscles. 2+8=10

Or

Describe how the wave of action potential is transmitted through the synapses. Why is the transmission of impulse faster in a myelinated nerve fibre? 8+2=10

6. Give names of different plasmic and platelet factors of blood coagulation. Explain the phases of blood coagulation in the light of enzyme cascade theory. 3+7=10

Or

Give a detailed explanation of ultrafiltration and selective reabsorption events in nephrons of metanephric kidney. Add a note on the role of hormones in formation of urine. 4+4+2=10

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