2017

M.Sc. Part–I Examination

ZOOLOGY

PAPER—II (Group—B)

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group—B

Answer any *four* questions taking *two* from each unit.

Unit—I

[Histology and Physiology]

1. (a) What is antolysis ? 2

(b) How formaldehyde reacts with several parts of the cellular protein molecules ? 4

(c) Write short notes on : 2×2

(i) Secondary liquefaction ;

(ii) Fixation by heat;

(d) How DNA molecules are fixed in laboratory. $2\frac{1}{2}$

2. (a) Explain the necessity for staining of tissues. $1\frac{1}{2}$

(b) State the difference between chromophore and auxochrome. Cite an example mentioning the chromophore and auxochrome part. 2

(c) Classify dyes on the basis of their physical characteristics. Cite examples for each type. 3

(d) Briefly describe the preparation of a dye of animal origin with its commercial importance. $2\frac{1}{2}$

(e) Elucidate the role of mordants in haematoxylin staining of tissues. $1\frac{1}{2}$

(f) Write notes on histological tissue preparation. 2

3. (a) Define Action potential. $1\frac{1}{2}$

(b) Graphically represent the phases of action potential in a nerve fibre. 3

(c) Classify neurotransmitter molecules on the basis of chemical nature and size. 2+2

(d) Write notes on : 2+2

(i) Synaptic transmission and role of Ca^{++}

(ii) Voltage gated sodium channel.

4. (a) Briefly describe the fluid mosaic model of cell-mermbrane structure. $2\frac{1}{2}$

(b) Describe the positive and negative feedback in homeostasis. $1\frac{1}{2}$

(c) Explain the basic difference between a peptide and a steroid hormone receptors. $2\frac{1}{2}$

(d) Elucidate the mechanism of action of a peptide hormone. $3\frac{1}{2}$

(e) Draw the vitamin A visual cycle. $2\frac{1}{2}$

Unit—II

[Biophysics and Biochemistry]

5. (a) What is Osmosis ?

(b) State Van't Hoff's equation of Osmotic pressure, defining all terms of the equation with units.

(c) Give Van't Hoff's equation for ionised solution. Give reason.

(d) Calculate the Osmotic pressure of one normal (1N) solution of cane sugar at 25°C. [Given R = 0.0821 Lit atm per degree per mole] $4+4+2\frac{1}{2}+2$

6. (a) What is Tyndall effect of colloidial particles. $2\frac{1}{2}$

(b) An enzyme catalyzed reaction has km of 1 mM and V_{max} of 5 nM. S^{-1}. What is the reaction velocity when the substrate concentration is

(i) 0.25 mM (ii) 10 mM 2

(c) What is the second law of thermodynamics ? "Increase of Entropy is a measure of unavailable energy"—Explain the statement. 2+4

(d) How does surfactant molecule reduce surface tenstion ? 2

7. (a) Write on the overview of β-oxidation of palmitic acid (a 16 carbon saturated fatty acid) ? 5

(b) Explain how does the co-ordinated actions of transaldolase and transketolase recycles xylulose-5 phosphate to Glucose-6-phosphate. $4\frac{1}{2}$

(c) Explain why ATP act as a competitive inhibitor in phosphorylation reaction of hexokinase. 3

8. (a) Explain the flow of electrons through Q cycle with proper illustrations. $5\frac{1}{2}$

(b) Give brief accounts of inhibitons of enzyme activity with appropriate diagram. 3

(c) Enzyme lowers the activation energy—Explain your answer. 2

(d) What is transdeamination in amino acid metabolism? 2