

2022

M.Sc.

2nd Semester Examination (CCAEE)

ZOOLOGY

PAPER—ZOO-202

Full Marks : 40

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.

ZOO-202.1 BIOPHYSICS

1. Answer any two questions : 2×2

- (a) The earth is an 'open as well as closed system' — justify from thermodynamic point of view.
- (b) What is reverse osmosis? Exemplify its application.

(Turn Over)

- (c) What are single-pass and multi-pass transmembrane proteins?
- (d) Distinguish between liquid emulsion and solid emulsion with examples.

2. Answer any *two* questions : 2×4

(a) What is electro dialysis? Write a note on its application. 1+3

(b) What is 'isoelectric pH' of a protein? Explain with the help of suitable illustration, what happens to a protein if the pH of the medium is lowered below or raised above its isoelectric pH? 1+3

(c) Cite an experiment to prove the mobility of protein molecules through the lipid bilayer of plasma membrane.

(d) Describe the design and operation of the electron gun of a transmission electron microscope.

3. Answer any *one* question : 1×8

(a) Explain first law of thermodynamics. Why is the law explained with reference to a closed system only? The latent heat of evaporation of water is

536 cal/g — calculate ΔH and ΔE in converting 1 mole of water at 100°C into steam at the same temperature, assuming water to behave as an ideal gas. 3+1+4

- (b) With proper reasoning, cite one example each of: (i) two solutions are isosmotic but not isotonic and (ii) two solutions are isotonic but not isosmotic. State Van't Hoff's laws of osmotic pressure. 6.84 g of sucrose (molecular weight = 342) is dissolved in 200 ml water at 27°C . Calculate the osmotic pressure of the solution. 3+2+3

ZOO-202.2 BIOCHEMISTRY

4. Answer any *two* questions : 2×2
- (a) Draw structures of the following amino acids, indicating the charged form that exists at pH 4 : histidine and protine.
- (b) Why the amino acids hydroxyproline is produced by post-translational modification ?
- (c) State the function of transaminase.
- (d) Draw a disulphide bridge between two cysteines in a polypeptide chain.

5. Answer any *two* questions : 2×4
- (a) What is oxidative deamination ? Give an account of Urea cycle. 2+2
- (b) What are the differences between domain and motif? What do you mean by β -conformations. 2+2
- (c) Describe the secondary structures of proteins with the help of Ramachandran's diagram.
- (d) Draw a schematic diagram for showing the flow of electrons in Q cycle of oxidative phosphorylation.
6. Answer any *one* question : 1×8
- (a) (i) Name two intermediate products of TCA cycle that are used in gluconeogenesis.
- (ii) Differentiate between gluconeogenesis and glycogenesis. Write a note on regulation of glycolysis. 2+2+4
- (b) Explain with schematic diagram, the mechanism of proteolytic enzyme action.
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