2024

M.Sc. 2nd Semester Examination (Old)

ZOOLOGY (CCAE)

PAPER : ZOL-202

Full Marks : 40

Time : 2 hours

The figures in the right-hand margin indicate marks.

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

Illustrate the answers wherever necessary.

Answer from both the Groups.

GROUP—A

(202.1 : Biophysics)

1. Answer *any* **two** of the following questions : 2×2

(a) A bird lays a fertilized egg in its nest. Which type of thermodynamic system is the egg and why?

(b) What is the difference between flip-flop movement and translational movement of lipid molecules in cell membrane?

(c) What happens when mammalian RBCs are placed in hypotonic and hypertonic solutions, respectively?

(d) Distinguish between solid aerosol and liquid aerosol with examples.

2. Answer *any* **two** of the following questions : 4×2

(a) Describe the design and operation of the electron gun of a transmission electron microscope. 4

(b) Define pH and discuss its significance in biological system. 1+3

(c) Cite an experiment to prove the mobility of protein molecules through the lipid bilayer of plasma membrane. 4

(d) Define dialysis. Give an account of electrodialysis and its application. 1+3

(b) *(i)* Give an account of urea cycle.

(ii) How does transamination help in gluconeogenesis? What is hexose mono-phosphate shunt? 4+2+2

★★★

3. Answer *any* **one** of the following questions : 8×1

(a) What is 'enthalpy' and how is it calculated? Prove that $\Delta H = \nabla Q$ (given that the symbols have their standard meanings). What is zeroth law of thermodynamics? Explain the term 'entropy'. 2+2+2+2

(b) Tabulate the differences between lyophilic sol and lyophobic sol. Give an account the asymmetric distribution of cell membrane proteins and the significance thereof. 4+4

GROUP—B

(202.2 : Biochemistry)

4. Answer *any* **two** of the following questions : 2×2

(a) What are the basic features of enzyme?

(b) Name the organs in which serotonin and thyroxine are produced.

(c) What are essential fatty acids? What type of fatty acids undergoes α-oxidation?

(d) Explain covalent vs. non-covalent interactions.

5. Answer *any* **two** of the following questions : 4×2

(a) What are the differences between domain and motif? Describe the secondary structure of proteins with the help of Ramachandran's plot.

(b) Write a note on biosynthesis and functions of melatonin.

(c) What is oxidative deamination? Explain why ATP act as competitive inhibitors of hexokinase mediated phosphorylation.

(d) Describe the mechanism of enzyme action with proper diagrams.

6. Answer *any* **one** of the following questions : 8×1

(a) *(i)* State the anabolic role of Krebs' TCA cycle. How do you link between protein metabolism and Krebs' TCA cycle?

(ii) Write a note on regulation of glycolysis. 2+2+4