M.Sc. 2nd Semester Examination 2023

ZOOLOGY

PAPER – ZOO-202.1 & 202.2

Full Marks : 40

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

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

PAPER – ZOO-202.1

(*Biophysics*)

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

(*a*) State the differences between facilitated diffusion and active transport with example. 2

(*b*) What is reverse Osmosis ? Exemplify its application. 2

(*c*) What is Colloid ? Cite examples. 1 + 1

(*d*) Write notes on : 1 + 1

(*i*) Use of Liposomes

(*ii*) Mobility of Phospholipid molecules.

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

(*a*) State the first law of thermodynamics. Write a note on : Enthalpy. 2 + 2

(*b*) Mention the function of a 'Electric double-layer'—system. Why Dialysis is essential for a critical renal patient ? 2 + 2

(*c*) What do you mean by isoelectric pH of a protein ? Explain with the help of suitable illustration. What happen to the ionic status of a protein if the pH of the medium in lowered below or raised above its isoelectric pH. 1 + 3

(*d*) Write notes on : 2 + 2

(*i*) Ionophores

(*ii*) Brownian Movement.

3. Answer the following question (any *one*) : 8×1

(*a*) Discuss the various ways in which membrane proteins are associated with the lipid bilayers. Write a short note on Tyndall effect. $6 + 2$

(*b*) Distinguish between flip-flop movement and translational movement of lipid molecules in cell membrane. How can you determine the resolving power of a TEM ? State three differences between lyophilic sol and lyophobic sol. $3 + 2 + 3$

PAPER – ZOO-202.2

(*Biochemistry*)

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

(*a*) Match each amino acid in the left-hand column with appropriate side-chain type in the right-hand column. 2

(*A*) Leu	(*i*)	hydroxl-containing
(*B*) Glu	(*ii*)	acidic
(*C*) Lys	(*iii*)	basic
(*D*) Ser	(*iv*)	sulfur-containing
(*E*) Cys	(*v*)	nonpolar-aromatic
(*F*) Trp	(*vi*)	non polar aliphatic

(*b*) Draw the structure of the dipeptide Gly-His. What is the charge on the peptide at pH 5.5 and pH 7.5 ? 2

(*c*) What are the two main types of cofactors ? State their similarities and dissimilarites. 1 + 1

(*d*) Briefly describe the oxidation state of ubiquinone. 2

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

(*a*) Explain the enzyme mechanism of hexokinase with reference to nucleophilic attack. 4

(*b*) (*i*) Write a short note on consensus sequences for protein kinase.

(*ii*) State the impact of competitive inhibitor on km of a enzyme. 2 + 2

(*c*) What is the common reaction steps in the fatty acid oxidation cycle and citric acid cycle. Comment on the statement "fatty acid as a source of water". 2 + 2

(*d*) What is the basis for the separation of proteins by the following techniques ?

(*i*) gel-filtration chromatography

(*ii*) ion-exchange chromatography. 2 + 2

6. Answer any *one* question from the following : 8 × 1

(*a*) (*i*) What are the different irregular helical structure of protein ? Explain how they differ from right handed α helix. 2 + 2

(*ii*) What is reverse turn ? Draw two types of reverse turns. 2

(*iii*) Why must glucine be found at regular intervals in the collagen triple helix ? 2

(*b*) (*i*) What is the advantage of mobile electron carriers, in addition to large membrane-bound complexes of carriers on mitochondrial innermembrane. 2

(*ii*) What is Q cycle ? Draw a schematic diagram showing movement of electron through the Q cycle. 1 + 3

(*iii*) What is the effect of Azide and carbon monoxide on electron transport and ATP production ? 2