PG/IIS/ZOO/205/25

M.Sc. 2nd Semester Examination, 2025

ZOOLOGY

(*Biochemistry*)

PAPER – ZOO-205

Full Marks : 25

Time : 1 hour

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

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

   (*a*) How can competitive and non-competitive inhibition be distinguished in terms of K_M ?

(*b*) What is a reverse turn ? Draw two types of reverse turns.

(*c*) Why must glycine be found at regular intervals in the collagen triple helix ?

(*d*) Name one cation and anion exchange resign used for ion exchange chromatography ?

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

(*a*) How does the oxidation of monounsaturated fatty acids differ from that of polyunsaturated fatty acids ?

(*b*) Clarify the acylation stage of the chymotrypsin reaction using a suitable diagram.

(*c*) Write down a brief note on the Ramachandran Plot. Write down the ϕ and ψ rotations of the following secondary conformations and place them in the plot : α helix (right-handed), 3_{10} helix, 2.2_7 ribbon, and parallel β sheet.

(*d*) What is the effect of Azide and carbon monoxide on electron transport and ATP production ? Briefly describe the oxidation state of ubiquinone.

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

(*a*) (*i*) What is the basis for the separation of proteins by the following techniques ? Gel-filtration chromatography, affinity chromatography and ion-exchange chromatography.

(*ii*) Sephadex G-75 has an exclusion limit of 80,000 molecular weight for globular proteins. If you tried to use this column material to separate alcohol dehydrogenase (MW 150,000) from β-amylase (MW 200,000), what would happen ? 6 + 2

(*b*) (*i*) In what ways does an electron move within the Q cycle ? Explain with proper illustrations.

(*ii*) Explain why degradation of odd-chain fatty acids can boost the activity of the citric acid cycle. 4 + 4

[Internal Assessment — 5 Marks]