2016

M.Sc. 1st Semester Examination

ZOOLOGY

PAPER—ZOO-102

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.

Use separate Answer-scripts for Group-A & Group-B

Group—A

(Cell Biology)

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

(a) What do you mean by GPI anchored protein?

(b) List the cascades of events that occur during tumor angiogenesis.

(c) Provide a brief account of cell cycle inhibitors.

(d) "CaM-Kinase-II acts as molecular memory device" Explain.

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

(a) State the mechanism of solubilization of integral membrane protein by nonionic detergents. 4

(b) How does Cdc25 family phosphatases activate Cdk1 complex ? 1

(c) Explain the role of GRB2 protein in activation of monomeric switch protein with suitable diagram. 4

(d) What is liposome ? Discuss the structure of different ATP-powered pumps. 1+3

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

(a) (i) Write a note on GTPase switch protein.

(ii) Signal molecule Acetylcholine binds to specific GPCR over pancreatic cells. — Illustrate the cascades of event after the activation of GPCR. 3+5

(b) (i) What do you mean by lipid raft ?

(ii) "E ıtry into cell cycle is tightly regulated" — Justify your answer providing at least two mechanisms. 2+6

Group—B

(Biophysics)

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

(a) What is nanotube ?

(b) 'The pH of erythrocytes is less than plasma' — Explain.

(c) State the function of prenyl groups within plasma membrane.

d) Notes on : Radiation Dosimetry.

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

(a) Why Scientillation counter is more sensitive than the Geiger-Muller counter ? Distinguish between β-decay and positive β-decay. 2+2

(b) Explain Helmholtz-Goye double layer of colloidal particles. Comment on Electrodialysis. 2+2

(c) How do you demonstrate the lateral diffusion rates of membrane proteins in the laboratory ? State the function of cholesterol in the lipid bilayer of the cell membrane. 3+1

(d) Notes on : $T_{1/2} = \frac{0.693}{\lambda}$

[$T_{1/2}$ = Half life of a radioactive element]

λ = Disintegration constant. 4

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

(a) (i) Write briefly how proteins are attached to the Lipid bilayer with a suitable diagram. 6

(ii) How do you demonstrate the nanostructure using modern tools in the laboratory ? 2

(b) Write notes on (any *four*) :

(i) Viscometer,

(ii) Glycophorin,

(iii) Radioisotope,

(iv) Triton X-100,

(v) Phospholipid mobillity,

(vi) Autoradiography,

(vii) Nanometer. 2×4