2012

M.Sc.

3rd Semester Examination

ZOOLOGY

PAPER—ZOO-301

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

Group—A

(*Microbiology*)

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

(a) Define Virus and give an example of common disease-causing-virus.

(b) What is selective media? Give an example.

(c) Comment on 'Hepanoid'.

(d) What is the speciality of Mycoplasma?

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

(a) What is Episomes? State their functions and draw their location in a cell.

(b) State different methods of measurement of bacterial growth.

(c) Draw the distribution of microbes in soil environment, describing the niche partitioning among them.

(d) Mention the types of RNA-viruses.

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

(a) (i) Give a comparative account of the five groups of microorganisms with distinctive features of each group. 5

(ii) State the formula to find out 'generation time' of a bacterium population. 3

(b) (i) Draw and describe the structural organisation of peptidoglycan layer of a bacteria. 5

(ii) Define colony, pure culture and strain. 3

Group—B

(*Bio-instrumentation*)

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

(a) State the use of OsO_4 in biological sample preparation for EM study.

(b) How RFC is calculated ?

(c) Why the column of an electron microscope requires high vacuum state ? — Explain.

(d) Mention four column packing materials in relation to exclusion chromatography.

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

(a) Using a diagram state the function of a phase plate.

(b) (i) What are the major units of a NMR-Spectrometer ?

(ii) State the name and function of electromagnetic lenses which are used in TEM. 2+2

(c) How do you protect the affinity matrix from unnecessary contamination ?

(d) Discuss the salient features of a Coolidge tube used for X-ray generation.

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

(a) (i) Elaborate the principle of ion-exchange chromatography with a suitable example.

(ii) State the effects of heat on gel electrophoresis and note on the biological application of the said technique.

(iii) Mention and define the absorbed dose unit of x-ray exposure used for biological systems.

4+2+2

(b) Write short notes on (any *four*) of the following : 4×2

(i) Chaotropic agents.

(ii) AFM-tip.

(iii) Photodetector used in Spectrophotometers.

(iv) Electromagnetic radiation.

(v) Electron gum.

(vi) Steps of Agarose Gel electrophoresis.

(Vii) Jablonski diagram.
