

2 0 1 8

ZOOLOGY

(Major)

Paper : 5.4

(**Biological Techniques and Biostatistics**)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Answer the following questions very briefly :

1×7=7

- (a) What is molar extinction coefficient?
- (b) Define mode.
- (c) What is critical point drying?
- (d) Write the definition of Pearson's chi-square test.
- (e) What is immunostain?
- (f) Define correlation coefficient.
- (g) What is native gel electrophoresis?

2. Answer any *four* of the following questions :

2×4=8

- (a) What is silver stain? Write the importance of silver stain in histological study.

(2)

- (b) Distinguish between arithmetic mean and median.
- (c) What is pH electrode? Write the working principle of pH electrode.
- (d) Describe about the machine language of a computer.
- (e) What is vibratome? Write about the use of vibratome.
- (f) What is linear regression in biostatistics?
- (g) Write the basic principle of centrifuge. Mention the use of ultracentrifuge in biological research.

3. Answer any *five* of the following questions :

3×5=15

- (a) What is freezing microtome? Write the advantages and disadvantages of freezing microtome.
- (b) What are the computer-aided techniques used in biology? Write the importance of computer-aided technique in medicine.
- (c) What is ion-exchange chromatography? Write the basic principle of ion-exchange chromatography.

(3)

- (d) What is the meaning of standard error of mean? Write the difference between standard deviation and variance.
- (e) Define autoradiography. Write the importance of receptor autoradiography in biology.
- (f) Establish the relation between wavelength of light and magnification.
- (g) Write the characteristics of data set suitable for chi-square test.

4. What is fluorescence dye? How does a fluorescence dye work? Write the importance of fluorescence dye in biological research.

3+4+3=10

Or

Describe biological database. Write the importance of biological database for taxonomic study.

5+5=10

5. What is HPLC? Describe about the reverse phase HPLC. Mention about the uses of HPLC in different fields.

3+3+4=10

Or

Describe different sampling techniques used in biological research.

10

(4)

6. (a) Define cryoprotectant. Write the necessity of sperm preservation. 2+3=5
- (b) What is absorption spectroscopy? Discuss the disadvantages of UV-visible spectroscopy. 2+3=5

Or

- (c) What do you mean by graphical representation of data? Write the significance of pie chart. 2+3=5
- (d) What is cumulative frequency curve? Draw a cumulative frequency curve from the data given below : 2+3=5

Marks Range	Number of Students
0-10	5
10-20	9
20-30	16
30-40	22
40-50	26
50-60	18
60-70	11
70-80	6
80-90	4
90-100	3

★ ★ ★