

3 SEM TDC ZOO M 3 (N/O)

2 0 1 7

(November)

ZOOLOGY

(Major)

Course : 303

(Bioinstrumentation and Biostatistics)

Time : 2 hours

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

(New Course)

Full Marks : 48

Pass Marks : 14

(Bioinstrumentation)

1. Fill in the blanks with suitable words : $1 \times 3 = 3$

- (a) In paper chromatography, R_f value can be calculated from the distance travelled by the component and the _____ from the application point.

- (b) _____ invented a microscope that allowed for the study of colourless and transparent biological materials without staining.
- (c) One of the two kinds of lamps used as light source in spectrophotometer is _____ lamp for measurement in the visible and near infrared ranges.
2. Give a brief description of the procedure of thin layer chromatography. 5
3. Distinguish between the following (any two) : 3×2=6
- (a) Scanning electron microscope and Transmission electron microscope
- (b) Magnification and Resolution power of a microscope
- (c) Standard compound microscope and Phase contrast microscope
4. Write short notes on any two of the following : 2½×2=5
- (a) Beer-Lambert law
- (b) Application of spectrophotometer
- (c) Differences between colorimeter and spectrophotometer

5. (a) Write the principle of a kymograph. 6

Or

Give an outline of the handling procedure of rotary microtome.

- (b) What do you mean by Svedberg unit? Give a description of any one kind of centrifuge machine. 1+4=5

(**Biostatistics**)

6. Rewrite the following sentences with the suitable words given : 1×3=3

- (a) Frequencies of a series are added in ascending or descending order to construct histogram/frequency polygon/ogive/pie chart.
- (b) Geometric mean / median / mean deviation/mode can be defined as the average dispersion of all the values ignoring the sign from either the mean or median of a series.
- (c) Student's *t*-test / *Z*-test / *F*-test / Chi-square test is used under normal distribution curve for small samples if the value of *n* is equal or less than 30.

7. Write short notes on any *three* of the following : 3×3=9

(a) An example of application statistics in the study of genetics

(b) Stratified random sampling

(c) Pie chart

(d) Histogram

8. Define standard deviation and write the formula for calculation of standard deviation from mean in ungrouped data. 3+3=6

Or

Describe the method of regression analysis with an example. 6

(Old Course)

Full Marks : 48

Pass Marks : 19

(**Bioinstrumentation**)

(Marks : 24)

1. Rewrite the following sentences with the suitable words from the given options : $1 \times 3 = 3$

(a) TLC / Ion exchange chromatography/
Paper chromatography/Gas chromatography is an inexpensive and rapid method that provides graphic and clear results.

(b) Standard compound microscope/Simple microscope/Phase-contrast microscope/
Electron microscope helps to study colourless and transparent biological materials without staining.

(c) In spectrophotometer, a monochromatic light / visible light / near visible light/
electromagnetic wave of invisible spectrums is used as to pass through the substance.

2. Give an outline of the procedure of paper chromatography.

3. Write short notes on any *two* of the following : 3×2=6
- (a) Transmission electron microscope
 - (b) Phase-contrast microscope
 - (c) Centrifugation
4. Distinguish between the following (any *one*) : 3
- (a) Beer's law and Lambert's law
 - (b) Spectrophotometer and Colorimeter
5. Draw a labelled sketch of a kymograph and its use. 2+4=6

Or

Give a brief description of the different components of a rotary microtome. 6

(Biostatistics)

(Marks : 24)

6. Fill in the blanks with suitable words : 1×3=3
- (a) _____ of a series is that value which occurs with maximum frequency.

(b) _____ of a series is the square root of the average (mean) of the squared deviations of all the values from their mean.

(c) _____ test of goodness of fit gives an idea about the divergence between observed and expected frequencies.

7. Write short notes on any *three* of the following : 3×3=9

(a) Application statistics in biological studies

(b) Student's *t*-test

(c) Multiple bar diagram

(d) Cumulative frequency curve

8. Explain the calculation of arithmetic mean of group data of a continuous or discrete series. 6

Or

Define mean deviation. How is it calculated?

2+4=6

9. What are the different methods of determination of correlation? Describe one of the methods with an example. 1+5=6

Or

What do you mean by regression analysis? Distinguish between correlation and regression. 2+4=6
