

**Model Question Paper PG Sem III (CZOOL-108)**

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**Set I**

Answer any five questions in which Q. No. 1 is compulsory and not selecting more than two from each group

1. Objective type questions

(i) In HPLC the columns filled with granular solid particles of silica or other material forms the

(a) Stationary phase (b) Mobile phase (c) Both (d) None

(ii) The NMR spectroscopy is based on the magnetic properties of

(a) Electrons (b) Atomic nuclei (c) Protons (d) Electron spin

(iii) The technique of Radio Immuno Assay was developed by

(a) Yalow and Berson (b) Edward Purcell and Felix Bloch (iii) Zavoisky (iv) None

(iv) The pore size in agarose gel used in electrophoresis, depends on agarose concentration. Low concentration of agarose is responsible for

(a) Larger pore size (b) Smaller pore size (c) Both (d) None

(v) The Magnetic Resonance Imaging is based on the principle of

(a) NMR (b) ESR (c) Immunoassay (d) TLC

(vi) t-test is the test of significance of means of two samples. In unpaired t-test, the two means calculated from two samples which are drawn from

(a) Same population (b) Two different populations (c) Both (d) None

(vii) Which of the following is a measure of dispersion in a statistical data

(a) Mean (b) Median (c) Standard deviation (d) Mode

(viii) The measures of central tendency are

(a) Univariate analysis (b) Bivariate analysis (c) Multivariate analysis (d) None

(ix) Which of the following is a bivariate analysis

(a) Mode (b) Regression (c) Standard deviation (d) Variance

(x) The chi square test is

(a) Non parametric test (b) Parametric test (c) Multivariate analysis (d) None

Group A

2. Describe working principle and applications of TEM.

3. What is electrophoresis? Describe principle and applications of electrophoresis. Describe the major differences between Agarose gel and SDS PAG electrophoresis.

4. Describe centrifugation giving its basic principle, types and applications.

5. Describe working principle, instrumentation and applications of NMR spectroscopy.

Group B

6. Define the terms Population, Sample and Variable with suitable examples. What do you mean by frequency distribution? Construct a pie-chart on the basis of following data:

Place	A	B	C	D
Milk production(in litres)	700	620	328	640

7. Define the measures of central tendency. Calculate the mean, median and mode from the following data:

No. of Earthworms	5	10	15	20	25
Length (in cms.)	3	5	7	3	2

8. What do you mean by measures of dispersion? Calculate the standard deviation and variance from the following data:

Observations	34	36	37	39	41	43
Frequency (f)	1	2	2	2	2	1

9. What is correlation? Describe different types of correlation and different methods of studying correlation.

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**Set II**

1. Objective type questions

(i) The NMR spectroscopy is based on

(a) Magnetic properties of Nucleons (b) Magnetic properties of electrons (c) Magnetic properties of neutrons (d) None

(ii) The methodology Of Radio Immuno Assay involves the use of

(a) Radioactive antibodies (b) Radioactive antigens (c) Radioactive ant-antibody (d) All of above

(iii) During Electrophoresis, the rate of movement of molecules in an electric field depends upon

(a) Net charge of the molecule (b) Net mass of the molecule (c) Both (d) None

(iv) Centrifugation technique is based upon

(a) Density, shape and size of the particle (b) Charge of the particle (c) Both (d) None

(v) The separation of molecules from a mixture by their distribution between two immiscible phases forms the basis of

(a) Electrophoresis (b) Chromatography (c) Spectroscopy (d) Immunoassay

(vi) Which of the following is not a measure of central tendency?

(a) Mean (b) Median (c) Variance (d) None

(vii) Square of the standard deviation is called

(a) Variance (b) Mean deviation (c) range (d) None

(viii) Regression is a

(a) Univariate analysis (b) Bivariate analysis (c) Both (d) none

(ix) Students t- test is a

(a) Parametric test (b) Non-parametric test (c) Both (d) none

(x) In Correlation, when an increase in the value of one variable is associated with the increase in the value of the other variable then it is called

(a) Positive correlation (b) Negative correlation (c) Zero correlation (d) None

#### Group A

2. Describe the working principle, instrumentation and applications of SEM.

3. Describe the principle, components and applications of HPLC.

4. Describe the working principle, instrumentation and applications of MRI.

5. Describe the principle, working methodology and applications of RIA.

#### Group B

6. What do you understand by measures of central tendency? Calculate the mean, median and mode from the following data:

Class-interval	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
Frequency	4	4	9	7	13	3	3	2	2	3

7. What do you mean by measures of dispersion? Calculate the standard deviation and variance from the following data:

Observations	5	10	15	20	25	30	35	40	45	60
Frequency (f)	2	4	6	6	10	10	10	6	4	2

8. What is Chi square ( $\chi^2$ ) test. Perform Chi square test to test the hypothesis whether the following observed frequencies in  $F_2$  generation of a mendelian dihybrid cross are corresponding with the 9:3:3:1 ratio or not.

82 Round and Yellow, 34 Round and Green, 28 Wrinkled and Yellow, 14 Wrinkled and Green.

9. What is regression? Describe different types of regression analysis. Calculate the regression coefficient and the value of the constants 'a' and 'b' from the following data:

X	24.2	24.6	25.4	26.2	27.0	28.1	28.8	29.7	30.6	31.3
Y	52	64	72	81	92	101	106	116	122	130

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