PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc DEGREE EXAMINATION DECEMBER 2023
(Third Semester)

Branch - APPLIED MICROBIOLOGY

BIOSTATISTICS & RESEARCH METHODS FOR MICROBIOLOGY

Time: Three Hours   Maximum: 50 Marks

SECTION-A (5 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (5 x 1 = 5)

1 A characteristic or attribute that can take on different values is known as
   - (i) Primary data
   - (ii) Limitation
   - (iii) Variable
   - (iv) Continuous data

2 In a positively skewed distribution, the relationship between mean, median, and mode is
   - (i) Mean > Median > Mode
   - (ii) Mean = Median = Mode
   - (iii) Mode < Median < Mean
   - (iv) Mean < Median < Mode

3 The t-test assumes that the data are
   - (i) Negatively skewed
   - (ii) Positively skewed
   - (iii) Normally distributed
   - (iv) Bimodally distributed

4 In simple linear regression, the relationship between two variables is represented by
   - (i) A bar graph
   - (ii) A scatter plot
   - (iii) A straight line
   - (iv) A curved line

5 In genetics research, statistics are used to study
   - (i) Inheritance patterns
   - (ii) Ecosystems and biodiversity
   - (iii) Geological formations
   - (iv) Chemical reactions in cells

SECTION - B (15 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks   (5 x 3 = 15)

6 a Describe discrete and continuous variables.
        OR
   b Give an outline of primary data.

7 a Calculate the Mean, Median, Mode for 45, 55, 58, 62, 65, 68, 69, 70, 73, 74, 77, 79, 74, 81, 74, 83, 89, 93, 96, 99.
        OR
   b Calculate the Standard Deviation and Co-efficient of Variation for 25, 28, 30, 27, 25.

8 a Explain with suitable examples regression analysis and standard error of regression.
        OR
   b Explain types of correlation and correlation coefficient. Give suitable examples.

9 a A bag contains 7 white, 6 red and 5 black balls. Two balls are drawn at random. Find the probability that both will be red.
        OR
   b Explain ANOVA and its applications.

10 a Outline the steps in testing research hypothesis.
        OR
   b How are biological databases searched with suitable tools?

SECTION -C (30 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks   (5 x 6 = 30)

11 a   Describe the various graphical representations of statistical data.

OR

b   Draw a histogram and frequency polygon for the following distribution

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Freq.	22	44	101	104	120	105	86	64	32	18

12 a   Calculate the mean and standard deviation for the following data

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Freq.	25	41	20	32	40	20	51	11

OR

b   Find the Variance and Standard Deviation of the Following Numbers: 1, 3, 5, 5, 6, 7, 9, 10.

13 a   Explain regression analysis, types and its applications.

OR

b   What are 3 assumptions of Karl Pearson's coefficient of correlation?

14 a   Find the t-test value for the following given two sets of values: 7, 2, 9, 8 and 1, 2, 3, 4.

OR

b   Test the hypothesis that the flower colour is independent of flatness of leaf using chi square test

Colour	Flat leaves	Curled leaves	Total
White flowers	99	36	135
Red flowers	20	5	25
Total	119	41	160

Use the following table giving the values of for one degree of freedom for different values of P-

P	.5	.1	.05
X^2	.455	2.706	3.841

15 a   Give an account on various research design.

OR

b   How are research reports prepared? Highlights the step wise process.

Z-Z-Z   END