Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
End Semester Examination: Jan.2022
Faculty: Science and Technology

Program:BScBiotech04 **Semester: I** **SET: A**
Program (Specific): Biotechnology **Course Type: core**
Class: FYBSc(Biotechnology) **Max.Marks: 35**
Name of the Course: Biomathematics and Biostatistics-I
Course Code:22BBT 108 **Time: 2Hr**
Paper: VIII

Instructions to the candidate:

1) ***There are 4 sections in the question paper. Write each section on separate page.***
2) ***All Sections are compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Draw a well labelled diagram wherever necessary.***

SECTION: A

Q1) Answer the following (Attempt any 5 out of 6) **5**

1. Define population
2. Define class frequency
3. Compute mean for following data 2,2,2,2,2,2
4. Define Diagonal Matrix.
5. Write $5^3 = 125$ in the logarithmic form.
6. In how many different ways 12 persons sit on circular table having 12 seats?

SECTION: B

Q2) Answer the following (Attempt any 5 out of 6) **10**

1. Explain simple random sampling with illustration
2. Compute: mean deviation about mode for the following data
   2,3,5,2,7,5,7,6,11,12
3. Define the terms:
   a) Quartile deviation
   b) Variance
4. Compute the dot product of the vectors u = (1,1,1) and v = (1,0,0).
5. Find the value of 'm' such that $4^{m+1} \times 4^2 = 4^4$.
6. State the fundamental Counting principle of Addition.

SECTION: C

Q3) Answer the following (All questions are compulsory) **8**

1. A) Explain the following :
   a) Histogram
   b) Frequency curve
   c) Less than cumulative curve
   d) More than cumulative curve

OR

B) Compute first Quartile (Q1) for following data:

class	0-9	10-19	20-29	30-39	40-49
frequency	5	12	15	4	4

2. A) Let u = (1, 2,-1) and v = (6, 4, 2) be vectors in R^3.Show that w = (9, 2, 7) is a linear combination of u and v.

OR

B) a) Find the area of the triangle whose height is 12 cm and base is 20 cm.
   b) Determine the equation of a line passing through the point (3,-2) with slope -2.

SECTION: D

Q4) Answer the following (All questions are compulsory) **12**

1.A) a) Define the following:

   i) Correlation
   ii) Regression

   b) Difference between correlation and regression

   c) Explain the following
   i)Correlation coefficient
   ii)Regression line Y on X

OR

B)Compute median and mode for the following data:

class	0-20	20-40	40-60	60-80	80-100
frequency	2	10	5	4	1

2. **A)**Compute vertex, focus, equation of the directrix, equation of the axis, length of latus rectum of the parabola $y^2 = 8x$**.**

OR

B)For A = $\begin{bmatrix} 1 & 2 \\ 1 & 0 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & 1 \\ 4 & 0 \end{bmatrix}$

a) Determine whether the matrices A and B are singular or non-singular.
b) Determine the matrix X such that 2A+ 3B + I = X.
c) Calculate BA.