A (Printed Pages 7)

(20622) Roll No. .....

B.Sc.(Bio-Tech.)-I Year

NS-3461

B.Sc. (Biotech.) Examination, June-2022

Biomathematics & Biostatistics

(B-107)

(New)

B.Sc. (Bio-Tech.)

Time : Three Hours] *[Maximum Marks : 50*

Note : Attempt any **five** questions. Each question carries 10 marks.

1. (a) If A = {1, 2, 3}, B= {2, 3, 4, 5} and C= {5, 7} then find

(i) $A \cup B$

(ii) $B \cup C$

(iii) $A \cup (B \cup C)$

(iv) $A \cap B$

(v) $A \cup A$

(b) Define subset

If U = {1, 2, 3, 4, 5, 6, 7, 8),

A = {1, 3, 5, 7},

B= {1, 2, 4, 5, 6, 7, 8}

Verify that $(A \cup B)' = A' \cap B'$

2. (a) Evaluate

$$\lim_{x \to 2} \frac{x^2 - 3x + 2}{x - 2}$$

(b) If $f(x) = 4x^3 + 2x^2 + 3x + 5$, then find the value of $f(0), f(-1), f\left(\frac{1}{2}\right), f(2)$ and $f(c)$.

3. (a) Evaluate

$$\frac{d}{dx}(5e^x + \sin x - 7\sec x)$$

(b) $\frac{d}{dx}\left(\frac{\sin x}{\cos x}\right)$

4. Evaluate

(a) $\int \tan^2 x \, dx$

(b) (i) $\int 6x^3\,dx$

(ii) $\int (px^4 + qx^2 + rx + s)\,dx$

5. (a) Complete the Laws of Logarithms

(i) $\log_a (mn) =$

(ii) $\log a\left(\frac{m}{n}\right) =$

(iii) $\log_a m^n =$

(iv) $\log_a 1 =$

(v) $\log_a a =$

(b) If $\log_a 2^{x+4} = \log_a 512$, then find the value of x.

6. (a) Find the Median for the following data :

C.I.	f
0-10	7
10-20	8
20-30	12
30-40	5
40-50	8

(b) Draw cumulative frequency curve (i.e. Ogive) from the following data :

C.I.	f
10-15	7
15-20	19
20-25	27
25-30	15
30-35	12

7. (a) If A and B are two events such that P(A) = 0.42, P(B) = 0.48 and P(A and B) = 0.16

Determine :

(i) P (not A)

(ii) P(not B) = 0.48

(iii) P (A or B)

(b) A card is drawn from a well-shuffled deck of 52 cards. Find the probability of drawing :

(i) A Black King

(ii) A Jack, queen, kind or Ace

(iii) A card which is neither a heart or a king

(iv) A spade or a club

8. The heights of 10 males of a given locality are found to be 70, 67, 62, 68, 61, 68, 70, 64, 64, 66 inches. Is it reasonable to believe that the average height is greater than 64 inches? https://www.ccsustudy.com Test at 5% significance level assuming that for a degrees of freedom

$$P(t > 1.83) = 0.05$$

9. Define Standard Deviation. Compute the mean deviation (M.D.) from the following data :

C.I.	f
5-15	5
15-25	15
25-35	12
35-45	16
45-55	2

Also find the coefficient of M.D.

10. Write a short notes on any **four** of the following :

(a) Sampling Theory

(b) Correlation

(c) Regression

(d) Skewness

(e) Standard distribution

(f) Latin Square Design (LSD)

(g) Randomized Block Design (RBD)