

School of Biomedical Science

**B.Tech Biotechnology
Semester End Examination - Jun 2024**

**Duration : 180 Minutes
Max Marks : 100**

Sem II - C1UC223B - Elementary Maths-II

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) Compute $\int \frac{1}{(x + x \log x)} dx$. K1(3)
- 2) One card is drawn from a well shuffled deck of 52 cards. If each outcome is equally likely, calculate the probability that the card will be a red card. K2(4)
- 3) Write the direction cosines of X, Y and Z axes? K2(6)
- 4) A die is thrown, find the probability of following events: K3(6)
 1. A number less than or equal to 1 will appear.
 2. A number less than 6 will appear.
 3. An odd number will appear.
- 5) A die is thrown, find the probability of following events: K3(6)
 1. A prime number will appear.
 2. A number greater than or equal to 3 will appear.
 3. A number more than 6 will appear.
- 6) Solve the differential equation $y' = \frac{x+y}{x}$. K3(9)
- 7) Find the shortest distance between the lines $\frac{x-1}{-1} = \frac{y+2}{1} = \frac{z-3}{-2}$ and $\frac{x-1}{1} = \frac{y+1}{2} = \frac{z+1}{-2}$. K3(9)
- 8) Find $\int \frac{2x}{(x^2 + 1)(x^2 + 3)} dx$. K4(8)
- 9) Find the distance of the plane $4x+y-3z=2$ from the point $(1,3,-4)$. K4(12)
- 10) In a bank, principal increases continuously at the rate of 5% per year. In how many years Rs 1000 double itself? K5(10)

- 11) Find the value of λ , so that the lines $\frac{x-1}{-3} = \frac{y-2}{2\lambda} = \frac{z-3}{2}$ and $\frac{x-1}{3\lambda} = \frac{y-1}{2} = \frac{z-6}{-5}$ are at right angles. Also, find whether the lines are intersecting or not. K5(15)

OR

- Find the value of λ , so that the lines $\frac{x-1}{-3} = \frac{7y-14}{\lambda} = \frac{z-3}{2}$ and $\frac{7x-7}{-3\lambda} = \frac{y-5}{1} = \frac{z-6}{-5}$ are at right angles. Also, find whether the lines are intersecting or not. K5(15)

- 12) A and B are two events such that $P(A) = 0.54$, $P(B) = 0.69$ and $P(A \cap B) = 0.35$. Find K6(12)

1. $P(A \cup B)$
2. $P(A' \cap B')$
3. $P(A \cap B')$
4. $P(B \cap A')$

OR

- In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random, find the probability that: K6(12)

1. The student opted for NCC or NSS.
2. The student has opted neither NCC nor NSS.
3. The student has opted NSS but not NCC.