

B.SC(IT) SEMESTER - 3 (NEP-2020) Examination**OCT/NOV-2025****Mathematics (Multidisciplinary Course)****Time: 2:00 Hours****Marks:50****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1 Answer the following questions (Any Two Out of Four) (10)

- (1) Explain Empty set and Power set with its property.
- (2) Prove Distributive Property in set.
- (3) $A = \{1, 2, 3, 4, 5, 6, 7\}$ $B = \{3, 4, 5, 6, 7, 8, 9\}$ $C = \{5, 6, 7, 8, 9, 10, 11\}$ then find out $(A \cup B)$, $(A \cap C)$, $(B \cap C)$.
- (4) Prove De' Morgan law 1. $(A \cup B)' = A' \cap B'$ 2. $(A \cap B)' = A' \cup B'$

Que.2 Answer the following questions (Any Two Out of Four) (10)

- (1) Let $A = \begin{bmatrix} -3 & 4 \\ 5 & -1 \\ 2 & 8 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 1 \\ 1 & -2 \\ 5 & 3 \end{bmatrix}$ Evaluate each of following.
 1) $2A$ 2) $5A - B$ 3) $B - 2A$ 4) $B + 2A$ 5) $4B - 2A$
- (2) Find the inverse of the following matrix.
 $\begin{bmatrix} 3 & -2 & 1 \\ 0 & 1 & 2 \\ -6 & 4 & -2 \end{bmatrix}$
- (3) Explain types of matrix (any five).
- (4) Explain multiplication operation of two matrices (3 X 3).

Que.3 Answer the following questions (Any Two Out of Four) (10)

- (1) Calculate the quartile deviation of the following data.

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Frequency	7	18	5	12	16	9

- (2) Explain frequency Distribution.
- (3) Explain Mean, Mode, Median.
- (4) Calculate the mode of the following data.

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Frequency	5	12	27	9	18	16

Que.4 Answer the following questions (Any Two Out of Four) (10)

- (1) Explain Mutually Exclusive event with example.
- (2) Explain types of events.
- (3) Explain Sample Space, experiment and outcome with example.
- (4) Two dice are rolled find the probability that the sum is
 (1) equal to 5
 (2) less than 8
 (3) even number.

Que.5 Answer the following questions (Any Two Out of Four) (10)

- (1) Explain any two operations between two sets with example.
- (2) If $A = \begin{bmatrix} 4 & 6 \\ 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}$, $C = \begin{bmatrix} 7 & 3 \\ 5 & 8 \end{bmatrix}$ then prove that $A(B + C) = AB + AC$
- (3) A and B are two events such that $P(A) = 3/10$ and $P(B) = 1/2$ and $P(B/A) = 2/5$ Find $P(A \cap B)$, $P(A/B)$ and $P(A \cup B)$.
- (4) Find the mean and mode of the following data.

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
frequency	15	14	6	11	18
