

B.C.A 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 Singleton set and finite set with its property.
- (2) Explain Equal set, Equivalent set, sub set and proper sub set.
- (3) Find the Area of Triangle whose point are (5, 3), (0, 10) and (1, -1).
- (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 $A = \begin{bmatrix} 3 & 4 \\ 7 & -1 \\ -2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 1 \\ -1 & -2 \\ 5 & 3 \end{bmatrix}$ 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 addition and subtraction operation of two matrices.

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

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

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency	5	8	15	16	6

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

Class	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Frequency	5	27	12	8	6

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

- (1) Explain Sample Space, experiment and outcome with example.
- (2) Explain types of events.
- (3) Two dice are rolled find the probability that the sum is
 - (1) equal to 4
 - (2) less than 9
 - (3) odd number.
- (4) Explain Mutually Exclusive event with example.

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) Find the mean and mode of the following data.

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
frequency	5	7	8	11	9	4

- (4) 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 $P(A \cup B)$.
