

B.C.A Semester - 2 (CBCS) Examination**March/April – 2026 (New Course)****Foundation of Mathematics and Statistics (CORE)****Time: 2:30 Hours****Marks: 70****Instructions:**

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

Que.1(A) Answer the Following Question (03)

(1) $\begin{vmatrix} 6 & 2 \\ -5 & 8 \end{vmatrix}$ find determinant.

(2) $\begin{vmatrix} 5 & 6 \\ -5 & 7 \end{vmatrix}$ find determinant.

(3) Define determinant.

Que.1(B) Answer the Following Question (Any Two out of Four) (06)

(1) $5x - 2y = 15$ and $3x - 3y = 18$ Find Determinant using Cramer's Rule.

(2) Find the determinant of $A = \begin{vmatrix} 2 & -3 & -6 \\ -4 & 5 & 3 \\ 6 & 2 & -2 \end{vmatrix}$

(3) $2x + 5y = 13$ and $4x + 13y = 20$ Find Determinant using Cramer's Rule.

(4) Find the determinant of $A = \begin{vmatrix} -3 & 6 & 3 \\ 4 & -3 & -6 \\ 2 & 5 & -8 \end{vmatrix}$

Que.1(C) Answer the Following Question (Any One out of Two) (05)

(1) Explain Properties of Determinants.

(2) Solve below linear equation using Cramer's Rule.

$$3x + y - z = 8$$

$$-2x + 5y + 3z = 9$$

$$3x + 2y + z = 4$$

Que.2(A) Answer the Following Question (Only Three) (03)

(1) Define Column matrix.

(2) Define Square matrix.

(3) Define Unit matrix.

Que.2(B) Answer the Following Question (Any Two out of Four) (06)

(1) If $A = \begin{bmatrix} 3 & 5 \\ -4 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 7 & -4 \end{bmatrix}$ then find $3A + 5B$, $4A - 2B$.

(2) Explain Properties of Matrix Multiplication.

(3) Find AB if $A = \begin{bmatrix} -3 & 6 \\ 7 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & -10 \\ -5 & 9 \end{bmatrix}$

(4) Explain Adjoint of Matrix.

Que.2(C) Answer the Following Question (Any One out of Two) (05)

(1) Find the inverse of matrix $A = \begin{bmatrix} -2 & 2 & 8 \\ 5 & -2 & -3 \\ 7 & 4 & 5 \end{bmatrix}$

(2) Explain properties of Inverse Matrix.

Que.3(A) Answer the Following Question (Only Three) (03)

(1) Define Equal Set.

(2) Define Finite Set

(3) Define parallel line.

- Que.3(B) Answer the Following Question (Any Two out of Four) (06)
- (1) Write down Demorgan's Law.
 - (2) Explain any three properties of set.
 - (3) If $A = \{1, 2, 3, 4, 5, 6\}$, $B = \{1, 2, 5, 6, 7, 9\}$ and $C = \{2, 3, 4, 6, 8, 9\}$ then find $(A \cup B) \cup (A \cap C)$.
 - (4) Write down the Quadrant for the following vertices A (4, 3), B (-2, -6), C (5, -2).
- Que.3(C) Answer the Following Question (Any One out of Two) (05)
- (1) Find the Area of Triangle use the vertices A (-3, 7), B (6, -4) and C (-4, 6).
 - (2) P (15, 21) and Q (17, 33) calculate internal and External deviation using section formula (where $m_1 = 12$, $m_2 = 22$).
- Que.4(A) Answer the Following Question (Only Three) (03)
- (1) Define Range.
 - (2) Define Quartiles.
 - (3) Define Median.
- Que.4(B) Answer the Following Question (Any Two out of Four) (06)
- (1) Observations are 12, 7, 15, 10, 7, 18, 20, 7 Find median and mode of the given observations.
 - (2) 12, -5, 7, 25, -10, 18, 3 Find Range and Co-Range.
 - (3) Observations are 12, 7, 15, 10, 18, 9, 14, 11 Find mean and median of the given observations.
 - (4) 12, -8, 25, 4, -15, 30, 18, -2, 10, 6 Find Range and Co-Range.
- Que.4(C) Answer the Following Question (Any One out of Two) (05)
- (1) The observations are: 5, 7, 8, 6, 9, 10, 12, 4 Find the Standard Deviation of the given observations.
 - (2) The observations are: 12, 15, 8, 20, 2, 5, 30 Find the Standard Deviation of the given observations.
- Que.5(A) Answer the Following Question (Only Three) (03)
- (1) Define Sequence.
 - (2) Define Series.
 - (3) Full form of AP and HP.
- Que.5(B) Answer the Following Question (Any Two out of Four) (06)
- (1) Given the sequence 3, 6, 9, 12,, find the 18th term and the sum of the first 11 terms.
 - (2) The 8th term of the A.P. is 12 and first term is 5. Find the common difference.
 - (3) Given the sequence 4, 8, 12, 16,, find the 14th term and the sum of first 16 terms.
 - (4) Obtain the formula of finding nth term of 4, 7, 10, 13 & hence find $T_{50} = ?$
- Que.5(C) Answer the Following Question (Any One out of Two) (05)
- (1) Three numbers are in G.P. their sum and product are 21 and 216 respectively find the numbers.
 - (2) If the first term of an A.P. is 50 and the common difference is -5, find the sum of the first 17 terms.
