**647510** **BCA2MatC104x** **Seat No :_____**

# B.C.A Semester - 2 (*CBCS*) Examination
## March/April – 2023 (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.

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**Q.1(A) Answer the following questions.** **(03)**

**1.** Define determinant.

**2.** $\begin{vmatrix} 8 & 6 \\ 9 & 7 \end{vmatrix}$ find determinant.

**3.** $\begin{vmatrix} -3 & -2 \\ -5 & -4 \end{vmatrix}$ find determinant.

**Q.1(B) Answer the following questions. (Any Two)** **(06)**

**1.** Find the determinant of A = $\begin{vmatrix} 2 & 1 & 5 \\ -6 & 7 & 1 \\ 3 & 4 & -5 \end{vmatrix}$

**2.** Find the determinant of A = $\begin{vmatrix} 6 & 10 & 5 \\ 2 & -2 & 6 \\ 4 & 4 & 3 \end{vmatrix}$

**3.** 4x -3y = 10 and 5x -24y = 12 Find Determinant using Cramer's Rule.

**4.** 4x +2y = 18 and 3x - y = 9 Find Determinant using Cramer's Rule.

**Q.1(C) Answer the following questions. (Any One)** **(05)**

**1.** Solve below linear equation using Crammer's Rule.

2x+ 2y+3z = 6
2x+2y + z = 8
x + 2y +3z = 10

**2.** Explain Properties of Determinants.

**Q.2(A) Answer the following questions.** **(03)**

**1.** Define Diagonal matrix.

**2.** Define Row matrix.

**3.** Write down formula for Transpose of matrix.

**Q.2(B) Answer the following questions. (Any Two)** **(06)**

**1.** Properties of Matrix Addition.

**2.** Explain Adjoint of Matrix.

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

**4.** If A = $\begin{bmatrix} 7 & 6 \\ 2 & 3 \end{bmatrix}$ and B = $\begin{bmatrix} 4 & 3 \\ 5 & 7 \end{bmatrix}$ Find AB.

**Q.2(C) Answer the following questions. (Any One)** **(05)**

**1.** Explain properties of Inverse Matrix.

**2.** Explain Different types of matrix with example.

**Q.3(A) Answer the following questions.** **(03)**

1. Write down formula of distance (d) = _____.
2. Define parallel line.
3. Write down the formula for straight line.

**Q.3(B) Answer the following questions. (Any Two)** **(06)**

1. If A ={1 , 2 , 3}, B ={3, 4, 5} and c={2,3,4,5,6} then find (A ∩ B) ∪ (A ∩ c).
2. Explain any three properties of set.
3. Write down demorgan's Law.
4. Write down the Quadrant for the following vertices A(-2,3), B(2,-6), C(5,2).

**Q.3(C) Answer the following questions. (Any One)** **(05)**

1. Find the Area of Triangle use the vertices A (4, -3), B (3, -5) and C (2, 5).
2. P (18, 24) and Q (28, 40) calculate internal and External deviation using section formula (where $m_1 = 12$, $m_2 = 22$).

**Q.4(A) Answer the following questions.** **(03)**

1. Define Median.
2. Define Range.
3. Define Mode.

**Q.4(B) Answer the following questions. (Any Two)** **(06)**

1. 10,-18,-28,-22,24,26,28 Find Range and Co-Range.
2. 10,1,12,18,15,-3,-2,-5,6,18 Find Range and Co-Range.
3. The Observation is 18,22,26,28,32,38,28 Find out median and mode.
4. The Observation is 28,42,38,36,44,46,44 Find out mean and mode.

**Q.4(C) Answer the following questions. (Any One)** **(05)**

1. Observation are 3,5,8,10,12,15, Then find the standard deviation for the given observation.
2. Observation are 3,8,13,15,23,18, Then find the standard deviation for the given observation.

**Q.5(A) Answer the following questions.** **(03)**

1. Full form of AP and GP.
2. Define AP.
3. Define Series.

**Q.5(B) Answer the following questions. (Any Two)** **(06)**

1. 7,14,21,28,….. Find the $14^{th}$ term and also find the sum of 14 term.
2. 2,4,6,8,….. Find the $20^{th}$ term and also find the sum of 20 term.
3. The $10^{th}$ term of an A.P. is 5/2 and first term is 19/4. Find the common difference.
4. Obtain the formula of finding $n^{th}$ term of 3 , 5 , 7 , 9 …. & hence find $T_{87}$ =?

**Q.5(C) Answer the following questions. (Any One)** **(05)**

1. If the first term of an AP is 67 and the common difference is -13, find the sum of the first 20 terms.
2. Three numbers are in G.P. their sum and product are 28 and 512 respectively find the numbers.

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