

B.C.A Semester - 2 (CBCS) Examination**March/April- 2018****CS-10 MATHEMATICAL & STATISTICAL FOUNDATION OF COMP. SCIENCE
(CORE)****Time: 2:30 Hours****Marks: 70****Instructions:**

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

- Que-1 (A) Give the answer in one word or in one line. (04)
1. What is the equation to find determinant of 2×2 matrix.
 2. What is the determinant of $A = \begin{bmatrix} 2 & 1 \\ 3 & 6 \end{bmatrix}$
 3. Which symbol is used to define determinant?
 4. Determinant is possible with _____ matrix.
- Que-1 (B) Attempt any one question. (02)
1. Solve for x and y using Cramer's Rule.
 $4x - 3y = 11$
 $6x + 5y = 7$
 2. Explain Cramer's Rule for 3 variables with example.
- Que-1 (C) Attempt any one Question. (03)
1. Explain determinant of 3×3 matrix with example.
 2. Write down the properties of determinant.
- Que-1 (D) Attempt any one Question. (05)
1. Find the determinant of the following.
 a) $A = \begin{bmatrix} 3 & 2 & 1 \\ 4 & 2 & 6 \\ 1 & 5 & 1 \end{bmatrix}$ b) $A = \begin{bmatrix} -2 & -1 & -3 \\ 2 & 0 & -2 \\ 4 & 2 & 6 \end{bmatrix}$
 2. Solve for the x, y and z using Cramer's Rule.
 $x + 2y + 3z = -5$
 $3x + y - 3z = 4$
 $-3x + 4y + 7z = -7$
- Que-2 (A) Give the answer in one word or in one line. (04)
- (1) What is square matrix?
 - (2) IF $A = \begin{bmatrix} 1 & 4 & 3 \\ 2 & 7 & 5 \end{bmatrix}$ then find $A!$
 - (3) What is unit matrix?
 - (4) If $A' = A$ then matrix is known as _____ matrix.
- Que-2 (B) Attempt any one Question. (02)
- (1) If $A = \begin{bmatrix} 3 & 9 \\ 2 & 7 \end{bmatrix}$ $B = \begin{bmatrix} 5 & 4 \\ 1 & 6 \end{bmatrix}$ then find.
 $A+B$ and $A-B$
 - (2) If $A = \begin{bmatrix} 1 & 2 \\ 4 & 6 \end{bmatrix}$ $B = \begin{bmatrix} 2 & 7 \\ 3 & 5 \end{bmatrix}$ then find.
 AB and BA .
- Que-2 (C) Attempt any one Question (03)
- (1) 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 $A(B+C) = AB+AC$.
 - (2) Find the inverse of matrix.
 (a) $A = \begin{bmatrix} 2 & -1 \\ 4 & 2 \end{bmatrix}$ (b) $A = \begin{bmatrix} 1 & 3 \\ 3 & 2 \end{bmatrix}$
- Que-2 (D) Attempt any one Question. (05)
- (1) Find the inverse of the following.
 (a) $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ (b) $A = \begin{bmatrix} 2 & 2 & 4 \\ -3 & 5 & 0 \\ 1 & 1 & 1 \end{bmatrix}$
 - (2) If $A = \begin{bmatrix} 1 & 2 & 3 \\ -4 & 3 & -2 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 \\ 0 & 2 \\ 2 & 0 \end{bmatrix}$

- Que-3 (A) Give the answer in one word or in one line. (04)
- (1) What is single tone set?
 - (2) If $A = \{a, b, c\}$ and $B = \{b, c, d\}$ then find $A \cap B =$ _____.
 - (3) Write the equation to find the distance between two points.
 - (4) What is directed line?
- Que-3 (B) Attempt any one Question. (02)
- (1) $A = \{1, 2\}$ $B = \{3, 4\}$ $C = \{5, 6\}$ then prove that $A \times (B \cap C) = (A \times B) \cap (A \times C)$.
 - (2) If the distance between two points $(k_1 - 4)$ and $(8, 2)$ is 10 then find K.
- Que-3 (C) Attempt any one Question. (03)
- (1) Prove that $(A \cup B)' = A' \cap B'$
 - (2) Prove that $(3, 2), (5, 4), (3, 6), (1, 4)$ are the vertices of square.
- Que-3 (D) Attempt any one Question. (05)
- (1) Explain following
 - (a) Union of set.
 - (b) Difference of two sets.
 - (2) Find the area of triangle.
 - (a) $A(1, -2), B(-5, -6), C(0, 3)$.
 - (b) $A(0, 0), B(1, 2), C(-1, 2)$.
- Que-4 (A) Give the answer in one word or in one line. (04)
- (1) What is median?
 - (2) The mode of the data: - 30 25 35 18 12 30 is _____.
 - (3) What is Quartile?
 - (4) Which is the most commonly used of measure of dispersion?
- Que-4 (B) Attempt any one Question. (02)
- (1) What is Arithmetic Mean?
 - (2) Find the Range and Co-efficient of Range for following frequency distribution.
- | | | | | | |
|---|-----|-----|-----|-----|-----|
| x | 105 | 117 | 182 | 125 | 130 |
| f | 10 | 12 | 14 | 16 | 18 |
- Que-4 (C) Attempt any one Question. (03)
- (1) Calculate the Mean.
- | | | | | | | | |
|--------------|------|-------|-------|-------|-------|-------|-------|
| Mark | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
| No. of stud. | 1 | 6 | 10 | 5 | 4 | 7 | 9 |
- Que-4 (D) Attempt any one Question. (05)
- (2) Explain advantages and disadvantages of median.
- Que-4 (B) Attempt any one Question. (02)
- (1) Calculate mean, median and mode for the following data.
- | | | | | | | | |
|---|----|----|----|----|----|----|----|
| x | 50 | 55 | 60 | 65 | 70 | 75 | 80 |
| f | 7 | 12 | 15 | 19 | 16 | 11 | 8 |
- Que-4 (B) Attempt any one Question. (03)
- (2) Calculate Range, Co-efficient of Range, Quartile deviation, Co-efficient of Quartile deviation.
- | | | | | | | | | |
|---|----|----|----|----|----|----|----|----|
| x | 69 | 75 | 83 | 89 | 92 | 94 | 97 | 92 |
|---|----|----|----|----|----|----|----|----|
- Que-5 (A) Give the answer in one word or in one line. (04)
- (1) What is sequence?
 - (2) For the sequence 1, 4, 7, 10, 13 find 17th term.
 - (3) Write down the equation for find sum of n terms in A. P.
 - (4) How many types of sequence?
- Que-5 (B) Attempt any one Question. (02)
- (1) The first term of G.P. is 50 and the 4th term is 1350 then find 5th term.
 - (2) 2, 4, 6, 8, 10 then find sum upto 20 terms.
- Que-5 (C) Attempt any one Question. (03)
- (1) Find the sum of all natural numbers between 500 and 1000 which are divisible by 13.
 - (2) The second and fourth term of G.P. are 18 and 72 respectively then find the sum of its first 10 terms.
- Que-5 (D) Attempt any one Question. (05)
- (1) Find the sum of the following series $0.7 + 0.77 + 0.777 + \dots$ n terms.
 - (2) The sum of four numbers in G.P. is 60 the A.M. between the first and the last is 18 then find numbers.
