647510 **0305212C4040** **Seat No: _____**

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 proove 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) Fine 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 proove 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) Proove that $(A \cup B)' = A' \cap B'$
(2) Proove 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

(2) Explain advantages and disadvantages of median.

Que-4 (D) Attempt any one Question. (05)

(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

(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 17^{th} 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 4^{th} term is 1350 then find 5^{th} 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 + ... 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.

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