647510 **0303212C4040** **Seat No :_____**

B.Sc.(IT) Semester - 2 (*CBCS*) Examination

March/April - 2023 (OLD COURSE)

MATHEMATICAL AND STATISTICAL FOUNDATION OF COMPUTER SCIENCE (CORE)

Time: 2:30 Hours **Marks: 70**

Instructions:

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

Q.1(A) Answer the following questions. **(04)**

1. Define determinant.

2. $\begin{vmatrix} 4 & 3 \\ 1 & 1 \end{vmatrix}$ find determinant.

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

4. $\begin{vmatrix} 3 & 2 \\ X & 4 \end{vmatrix} = 10$ find x.

Q.1(B) Answer the following questions. (Any One) **(02)**

1. Find the determinant of $\begin{vmatrix} 38 & -39 \\ 32 & -37 \end{vmatrix}$

2. Find the determinant of $\begin{vmatrix} 8 & -14 \\ 28 & -29 \end{vmatrix}$

Q.1(C) Answer the following questions. (Any One) **(03)**

1. Find the determinant of $\begin{vmatrix} 3 & 2 & 4 \\ 5 & 3 & 1 \\ 2 & 4 & 5 \end{vmatrix}$

2. 14x + 20y = 42 and 3x + 18y = 52 Find Determinant using Cramer's Rule.

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

1. Explain properties of determinant.

2. 8x - 2y + 34z = 1 , x + 56y - 9z = 18 and 4x + y - 7z = 2 Find Determinant using Cramer's Rule.

Q.2(A) Answer the following questions. **(04)**

1. Define matrix.

2. Define unit matrix.

3. Define diagonal matrix.

4. Define column matrix.

Q.2(B) Answer the following questions. (Any One) **(02)**

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

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

Q.2(C) Answer the following questions. (Any One) **(03)**

1. If A = $\begin{bmatrix} 4 & 2 \\ -2 & 3 \end{bmatrix}$ and B = $\begin{bmatrix} 5 & 2 \\ 3 & -2 \end{bmatrix}$ then find 8A - 6B.

2. Explain Unit Matrix with example.

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

1. Explain Transpose and Inverse matrix with example.
2. Explain Addition and subtraction of two matrix with example.

Q.3(A) Answer the following questions. **(04)**

1. Define quadrant.
2. Define Equivalent set.
3. Define union operation.
4. Define intersection operation.

Q.3(B) Answer the following questions. (Any One) **(02)**

1. Explain Associative law of set.
2. Write down demorgan's Law.

Q.3(C) Answer the following questions. (Any One) **(03)**

1. Find the distance between the points A (15 ,20) and B (30 ,40).
2. If A = { 1,2,3,4,5,6,7} and B = {3,4,5,6,8,9 } then find (A∪B) ∩ (A∪B).

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

1. Explain Cartesian product of set with example.
2. Find the Area of Triangle use the vertices A(18, 50), B (12, 42) and C(-8, 30).

Q.4(A) Answer the following questions. **(04)**

1. The median of observation 28,42,38,44,46,44 = _____.
2. Define Median.
3. Define Mode.
4. The median of observation 10,12,8,5,5,2,3,4 = _____.

Q.4(B) Answer the following questions. (Any One) **(02)**

1. 2,4,6,8,10,12,14,16 Find Range and Co-Range.
2. 3,6,9,12,15,18,21,24,27,30 find mean and median.

Q.4(C) Answer the following questions. (Any One) **(03)**

1. 18,28,29,33,34,38,46,42,28,48,29 find mean, median and mode.
2. Explain advantages of Median.

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

1. Find out Quartile deviation and co-efficient of Quartile deviation.

X	10	20	30	40	50	60	70
f	3	9	13	15	20	28	6

2. Find out mean, median and mode.

Class	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
f	5	4	3	4	9	8	6	5

Q.5(A) Answer the following questions. **(04)**

1. Full form of GP.
2. Define Arithmetic Progression.
3. Define Series.
4. Write the formula for sum of n^{th} term in A.P.

Q.5(B) Answer the following questions. (Any One) **(02)**

1. In GP Find out the 7^{th} term of 4,16,64…..
2. In AP Find out the 8^{th} term of 2,6,10,14……

Q.5(C) Answer the following questions. (Any One) **(03)**

1. In AP $T_4 = 28$, $T_7 = 49$ then find out the T_{17} = ?
2. In GP 18,36,54,72,….. Find the 38^{th} term and also find the sum of 38^{th} term.

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

1. Find the sum of the first 23 terms of the arithmetic sequence
2. Find three numbers are in A.P whose sum is 15 and product is 93.

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