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BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
EXAMINATION : JUNE- 22
SEMESTER - I

Sub: Mathematics (BCA – 132/142/142-18/142-20/BCA-CS-142-20)

Date : 22 / 06 / 2022

Total Marks : 60

Time: 10.00 am to 12.30 pm

Instructions:

1. All questions are compulsory unless and otherwise stated.
2. Bold figures to the right of every question are the maximum marks for that question.
3. Candidates are advised to attempt questions in order.
4. Answers written illegibly are likely to be marked zero.
5. Use of scientific calculators, Log tables, Mollier Charts is allowed.
6. Draw neat and labeled diagrams wherever necessary.

Q.1. Solve (Any 4)

(8)

1. If $A = \{\mathbf{I; II; III; IV}\}$, $B = \{\mathbf{II; III; VI; VII}\}$, $C = \{\mathbf{III; IV; V; VI}\}$ then find out the sets as $A \cup B, A \cap B, A \cup C, A \cap C, B \cup C, B \cap C, A \cup B \cup C,$

2. $A = \begin{bmatrix} \mathbf{2} & \mathbf{4} \\ \mathbf{3} & \mathbf{2} \end{bmatrix}$, $B = \begin{bmatrix} \mathbf{1} & \mathbf{3} \\ \mathbf{-2} & \mathbf{5} \end{bmatrix}$, $C = \begin{bmatrix} \mathbf{-2} & \mathbf{5} \\ \mathbf{3} & \mathbf{4} \end{bmatrix}$
 Find $A+B+C$

3. If $T_n = 3n^2 + 4n + 7$, find T_4, T_9 ,

4. Evaluate: $\begin{vmatrix} \mathbf{1} & \mathbf{-2} & \mathbf{4} \\ \mathbf{7} & \mathbf{0} & \mathbf{8} \\ \mathbf{0} & \mathbf{4} & \mathbf{-3} \end{vmatrix}$

5. Find the A.M., G.M. and H.M. of the numbers 5 and 9.

6. $(110001101)_2 - (11111)_2 = \dots$

Q.2. Solve (Any 3)

(9)

1. Solve the following equations by Cramer's rule:
 $3x + 2y = 13$ & $5x - 8y = 1$
2. Two dice are thrown. Write sample space. Find the probability of A= sum is same on both the dice.
3. If the sum of the roots of the quadratic equation is 12 and their product is 32. Find the equation.
4. If $f(x) = 2x^2 - 2x - 1$ and $g(x) = x - 1$ then find the value of $f \circ g(x)$.

Q.3. Solve (Any 2)

(8)

1. Solve the given system of equations with Cramer's rule-
 $x + y - z = -2$, $2x - y + z = 5$, $5x - 2y + 3z = 13$

2. If $A = \begin{bmatrix} \mathbf{1} & \mathbf{2} & \mathbf{3} \end{bmatrix}$, $B = \begin{bmatrix} \mathbf{4} & \mathbf{9} \\ \mathbf{6} & \mathbf{3} \\ \mathbf{8} & \mathbf{0} \end{bmatrix}$

Find the value of AB .

3. If $f(x) = \frac{3x+4}{5x-7}$ and $g(x) = \frac{7x+4}{5x-3}$ find fog & gof

Q.4. Solve (Any 3) (15)

1. 1. Find the value of k , if the quadratic equation $3x^2 = -6kx - (k + 2)$, having
- (i) The sum of the roots is zero.
 - (ii) The product of the roots is zero.
 - (iii) Both roots are equal.

Product of the roots is -1

2. 1. Solve the following equations by Cramer's rule:
 $3x + 2y = 13$ & $5x - 8y = -1$
3. 4. If $A = \{-5, -4, -3, -2, 1, 2, 3\}$; $B = \{-2, -1, 0, 1, 2, 3\}$ and $C = \{-5, 0, 3, 4, -3\}$

Verify the following results:

i) $(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$ ii) $(A \cap B) \cup C = (A \cup C) \cap (B \cup C)$.

4. Calculate the Laspeyre's, Paasche's & Fisher's Index number of the following data:

Commodity	P ₀	q ₀	p ₁	q ₁
A	8	5	10	5.6
B	6	10	2	12
C	5	6	6	6
D	10	3	12	2.4

Q.5. Solve. (Solve any 2) (20)

1. Find the value of k , if the quadratic equation $3x^2 = -6kx - (k + 2)$, having
- (iv) The sum of the roots is zero.
 - (v) The product of the roots is zero.
 - (vi) Both roots are equal.

Product of the roots is -1

2. 3. Calculate the Mean, Mode & Median, SD for the following data:

Classes	0-10	10-20	20-30	30-40	40-50
Frequency	12	13	25	18	12

3. Write ,'' Types of Matrices "with proper examples.