

11 APR 2019

Code: 20215

B.Sc. (IT) Semester – 1 CBCS (NEW)

Core Course CC-106: Computer Oriented Mathematics

Time: 2 ½ Hours

Total Marks: 70

- Q.1 (a) Let  $U$  be a set of alphabets A to Z. Let  $A$  be a set of letters of the word 'AMAZON',  $B$  be a set of letters of the word 'AMAZED' and  $C$  be a set of letters of the word 'FLIPKART' [7]

(i)  $(A \cup C)'$  (ii)  $(A \cap B) \cup C$  (iii)  $(A - B) \cup (B - C) \cup (C - A)$ .

- (b) If  $f(x) = 2x^2$  and  $g(x) = 3x - 2$  then find (i)  $f(-2)$  (ii)  $g(0)$  [7]  
(iii)  $f(g(2.5))$  (iv)  $g(f(3.1))$ .

OR

- Q.1 (a) Explain D'Morgan's Law of set theory by giving an example. [7]

- (b) Define: (i) Subset (ii) Range of a function [7]  
(iii) One-one function (iv) Symmetric difference of two sets.

- Q.2 (a) If  $\bar{a} = (1, 1, 1)$ ,  $\bar{b} = (2, 2, 2)$  and  $\bar{c} = (3, 3, 3)$  then find [7]

(i)  $(\bar{a} \times \bar{b})$  (ii)  $\bar{a} \cdot \bar{b}$  (iii)  $3\bar{a} - \bar{b}$  (iv)  $|-2\bar{a} + \bar{c}|$

- (b) Let  $A = \begin{bmatrix} 1 & 2 \\ -2 & 0 \end{bmatrix}$ ,  $B = \begin{bmatrix} -3 & 2 \\ -2 & -4 \end{bmatrix}$  and  $O$  is a zero matrix. [7]

Find a matrix  $X$  such that  $(A + B)^2 - X = O$ .

OR

- Q.2 Solve following equations using matrix inversion method: [14]

(i)  $x + 2y - 8 = 0$ ,  $3x + 4y - 14 = 0$

(ii)  $6x + 2y - 10 = 0$ ,  $4x + 10y + 2 = 0$

- Q.3 (a) How many different odd numbers from 1000 to 9999 which are divisible by 3? [7]

- (b) Write an algorithm to find addition of two vectors. [7]

OR

- Q.3 (a) Explain with example and formula: (i) Permutation (ii) Combination [7]

- (b) Write an algorithm to find subtraction of two matrices. [7]

- Q.4 (a) Find the sum of all positive even numbers less than 999. [7]  
(b) For a G.P., third term is 12 and sixth term is 96. Find its fourth and seventh term. [7]

**OR**

- Q.4 (a) The sum of 6 terms of an A.P. is 57 and the sum of its 10 terms is 155. [7]  
Find its 20<sup>th</sup> term.  
(b) Find the sum of first n terms of the series:  $\frac{1}{3} + \frac{1}{6} + \frac{1}{12} + \frac{1}{24} + \dots$  [7]
- Q.5 Define the following terms and give one example of each: [14]  
(i) Loop (ii) Labeled graph (iii) Parallel edges (iv) Degree of a vertex  
(v) Cycle (vi) Tree (vii) Connected graph

**OR**

- Q.5 Explain with example: (i) Intersection of graphs (ii) Isomorphism [14]

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