

**AL-57**

**003-003208**



**B.C.A. (CBCS) (Sem.-II) (New) Examination**

**April-2013**

**Mathematics & Statistical Foundation of Computer Science**

**Faculty Code : 003  
Subject Code : 003208**

**Time : 2.30 Hours]**

**[Total Marks : 70**

1. M.C.Q.

**20**

- (1) How many subsets of  $A = \{1, 2, 3\}$  are possible ?
- (a) 3 (b) 4  
(c) 6 (d) 8
- (2)  $A \cap \phi =$  \_\_\_\_\_.
- (a)  $\{\phi\}$  (b)  $\cup$   
(c)  $\{\}$  (d) A
- (3) For two finite sets A and B if  $n(A) = n(B)$ , then A and B are called \_\_\_\_\_.
- (a) Null set (b) Equivalent set  
(c) Unit set (d) None
- (4) The set having only one subset is \_\_\_\_\_.
- (a) Null set (b) Unit set  
(c) Infinite set (d) None
- (5) Which of the following condition satisfied in symmetric matrix ?
- (a)  $A = -A'$  (b)  $A = I$   
(c)  $A = 0$  (d)  $A = A^T$

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**1**

**P.T.O.**



(12) The slope of the line passing through the points (2, 2) & (4, 6) is

- (a) 4 (b) 3  
(c) 2 (d) None

(13) If  $a = 1, l = 9$ , then  $S_{12} =$  \_\_\_\_\_.

- (a) 60 (b) 14  
(c) 25 (d) 70

(14) The common ratio of a G.P. 2, 6, 18, 54, .... is \_\_\_\_\_.

- (a) 3 (b)  $\frac{1}{3}$   
(c) 2 (d) 4

(15) The common difference of an A.P. 50, 45, 40, 35 ..... is \_\_\_\_\_.

- (a) 5 (b) -5  
(c)  $\frac{1}{5}$  (d) 0.5

(16) If  $a = r = 2$ , the fourth term of a sequence is \_\_\_\_\_.

- (a) 12 (b) 16  
(c) 8 (d) 2

(17) The mean of the observations

3, 2, 10, 4, 1 is \_\_\_\_\_.

- (a) 20 (b) 5  
(c) 15 (d) 4



(b) Any **three** :

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- (1) The A.M. of 150 items is found to be 25. Later on it was found that two items were wrongly taken as 32, 50 instead of 82, 80. Find correct mean.
- (2) The median of following distribution is 32. Find missing frequency.

<b>Marks :</b>	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
<b>No. of students :</b>	5	8	–	6	3

- (3) Find a point which divides the line joining (2, 8) and (6, 14) externally in the ratio 5 : 3.
- (4) If  $A = \{a, b\}$ ,  $B = \{2, 3\}$ ,  $C = \{3, 4\}$ , find  $A \times (B \cap C)$  &  $A \times (B \cup C)$ .
- (5) Define union of sets with example and write properties of union.
- (6) If  $U = \{a, b, c, 1, 2, 3\}$ ,  $A = \{a, 1, 2\}$ ,  $B = \{a, b, 3\}$  verify  $(A \cup B)' = A' \cap B'$ .

(c) Any **two** :

10

- (1) Prove :  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- (2) Prove that (3, 2), (5, 4), (3, 6), (1, 4) are the vertices of a square.
- (3) Find the equation of line passing through the point (-3, 1) & perpendicular to the line  $5x - 2y + 7 = 0$ .
- (4) Find Median :

<b>Class :</b>	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
<b>Frequency :</b>	10	20	30	50	40	30

- (5) Find Mean :

<b>Class :</b>	10 – 18	18 – 30	30 – 40	44 – 54	54 – 80	80 – 110
<b>Frequency :</b>	15	28	36	18	10	8

3. (a) Any **three** :

6

- (1) Define diagonal matrix, square matrix.
- (2) Define with example :
  - (i) Arithmetic progression
  - (ii) Geometric progression
- (3) If  $A = \begin{bmatrix} 5 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 3 \\ 0 \end{bmatrix}$  find AB and BA.
- (4) Find distance between the points A (4, -1) & B (7, 3).
- (5) The 100<sup>th</sup> term of an A.P. is 505 and common difference is 5 find its first term.
- (6) Find sum of first 20 terms of an A.P.  
15, 18, 21 .....

(b) Any **three** :

9

- (1) Which term will be  $\frac{1}{1536}$  in a G.P.  $\frac{1}{3}, \frac{1}{6}, \frac{1}{12}, \dots$  ?
- (2) The fourth and seventh terms of a GP are 72 and 576 respectively. Find its first term.
- (3) If  $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & -1 & 0 \\ -2 & 3 & 5 \end{bmatrix}$  find  $A + A'$
- (4) The 4<sup>th</sup> term of an A.P. is 19 and its 12<sup>th</sup> term is 51. Find its 21<sup>st</sup> term.
- (5) Prove that the line passing through the points (1, 7) & (3, 11) is parallel to the line passing through the points (3, 4) & (0, -2).
- (6) If  $A = \begin{bmatrix} 4 & 1 \\ 2 & 3 \end{bmatrix}$  find matrix B such that  $A + 2B = A^2$ .

(c) Any **two** :

10

(1) If  $S_1, S_2, S_3$  are respectively sum of  $n, 2n, 3n$  terms of an AP.

Prove that  $S_3 = 3(S_2 - S_1)$ .

(2) Three numbers are in AP, their sum and product are 15 and 105.

Find the number.

(3) If  $A = \begin{bmatrix} -4 & -3 & -3 \\ 1 & 0 & 1 \\ 4 & 4 & 3 \end{bmatrix}$  prove that  $\text{adj } A = A$ .

(4) If  $A = \begin{bmatrix} 1 & 3 & 2 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$  find Inverse of A.

(5) If  $A = \begin{bmatrix} 1 & 1 & -1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{bmatrix}$   $B = \begin{bmatrix} -1 & -2 & -1 \\ 6 & 12 & 6 \\ 5 & 10 & 5 \end{bmatrix}$

Find AB & identify the matrix.

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