

Roll No. 

Total No. of Pages : 02

Total No. of Questions : 07

**BCA (Sem.-1)**  
**MATHEMATICS (BRIDGE COURSE)**  
Subject Code : BC-102  
Paper ID : [B0202]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

- I. (a) Express the set  $A = \{x : 2x + 3 = 7\}$  in tabular form.  
(b) Evaluate  $\cos 105^\circ$   
(c) Write any two properties of matrices.  
(d) Define disjoint sets.  
(e) Find the fifth term in the expansion of  $\left(\frac{4x}{5} - \frac{5}{2x}\right)^8$   
(f) Write the power set of  $A = \{1, 3, 5\}$   
(g) Convert the following class-intervals from inclusive to exclusive form  
1-2, 3-4, 5-6, 7-8, 9-10  
(h) Determine mode from the following data  
8, 9, 11, 16, 11, 23, 21, 27, 21, 35, 21, 7, 11  
(i) If R is the relation "is less than" from  $A = \{1, 2, 3, 4, 5\}$  to  $B = \{1, 4, 5\}$ . Write R as a set of ordered pairs.  
(j) Solve for x, if  $\begin{vmatrix} x & 3 \\ 5 & 2x \end{vmatrix} = \begin{vmatrix} 5 & -4 \\ 5 & 3 \end{vmatrix}$

(10 × 2 = 20)

**SECTION-B**

- II. (a) A class has a strength of 30, out of it 17 students have taken mathematics and 13 have taken mathematics but not statistics. Find (i) the number of students who have taken mathematics and statistics (ii) How many of them have taken statistics but not mathematics.

(b) Draw Venn diagram to illustrate

$$(A \cup B) \cup C = A \cup (B \cup C)$$

III. (a) Prove that  $\frac{\cos \theta}{1 - \sin \theta} + \frac{1 - \sin \theta}{\cos \theta} = 2 \sec \theta$

(b) If  $\sin A = \frac{4}{5}$ , where A lies in the first quadrant, find the value of  $\frac{5 \cos A + 4 \operatorname{cosec} A + 3 \tan A}{4 \cot A + 3 \sec A + 5 \sin A}$ .

IV. (a) Find the term independent of  $x$  in the expansion of  $\left(2x^2 - \frac{1}{x}\right)^{12}$ .

(b) Prove by using principle of induction that  $1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$ ,  $n \in \mathbb{N}$

V. (a) If  $A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$ , then evaluate  $A^2 - 3A + 9I$ .

(b) Without expanding, evaluate  $\begin{bmatrix} 1 & a & a^2 - bc \\ 1 & b & b^2 - ac \\ 1 & c & c^2 - ab \end{bmatrix}$ .

VI. (a) Distinguish between primary data and secondary data.

(b) Find the mean for the following :

Marks obtained :	0-7	7-14	14-21	21-28	28-35	35-42	42-49
No. of students :	19	25	36	72	51	43	28

VII. (a) Calculate all the Cofactors for the matrix

$$\begin{bmatrix} 1 & 0 & -1 \\ 3 & 4 & 5 \\ 0 & -6 & -7 \end{bmatrix}$$

(b) Write short note on tabulation of data.

(4 × 10 = 40)