Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 07

BCA (2010 Batch) (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 has to attempt any FOUR questions.**

SECTION-A

1. Write briefly :

(a) Express the set A = {1, 3, 5, 7, 9} in a set-binder form.

(b) Evaluate sin 75º.

(c) Write any **two** properties of determinants.

(d) If A = {1, 2, 3, 4, 5}, B = {3, 4, 5, 6, 7}, find A – B.

(e) Find fourth term in the expansion of $\left(2x - \frac{3y}{4x}\right)^{11}$.

(f) What is the empirical relation between Mean, Median and Mode?

(g) Write the Power set of A = {2, 4, 6}.

(h) If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$, then find the value of $A^2 - 2A - 3I$.

(i) If R is the relation "is less than" from A = {1, 3, 5, 7} to B = {6, 8, 10}. Write R as a set of ordered pairs.

(j) Define statistics.

SECTION-B

2. (a) In a class of 60 boys, there are 45 boys who play cards and 30 boys play carrom. Use venn diagram to show how many boys play both the games? How many play cards only and how many play carrom only?

   (b) If A = {*a*, *b*, *c*, *d*, *e*}, B = {*a*, *c*, *e*, *g*} and C = {*a*, *b*, *g*} verify that $A \cap (B - C) = (A \cap B) - (A \cap C)$.

3. (a) Prove that $\frac{\sin A}{1+\cos A} + \frac{1+\cos A}{\sin A} = 2 \text{ cosec } A$.

   (b) If $\cos A = \frac{21}{29}$ and A lies in the first quadrant, find the value of sin A + tan A.

4. (a) Find the term independent of x in the expansion of $\left(\frac{3x^2}{2} - \frac{1}{3x}\right)^9$.

   (b) By using Principle of induction, prove that

   $$1^2 + 2^2 + 3^2 = \ldots\ldots\ldots + n^2 = \frac{n(n+1)(2n+1)}{6}, n \in N.$$

5. (a) If $A = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$ find AB and BA.

   (b) Without expanding, evaluate $\begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix}$.

6. (a) What are primary data? Explain various methods of collecting primary data.

   (b) Calculate the mean for the following data :

Marks :	0–10	10–30	30–40	40–50	50–80	80–100
No. of Students :	5	7	15	8	3	2

7. (a) Find cofactors of all elements of the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$.

   (b) Write a short note on tabulation of data.