

Roll No.

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Total No. of Pages : 02

Total No. of Questions : 07

BCA (Sem.-1st) (2007 to 2010 Batch)
MATHEMATICS (Bridge Course)
Subject Code : BC-102
Paper ID : [B0202]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION 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.

(a) Prove that $A^C - B^C = B - A$ where A and B are two sets.

(b) Show union of two sets using Venn diagram.

(c) Write dual of $(B \cup U) \cap (\phi \cup B') = \phi$

(d) Evaluate ${}^{50}C_{47}$.

(e) Prove that $\sin 2A = \frac{2 \tan A}{1 + \tan^2 A}$.

(f) If $\begin{bmatrix} 2x-y \\ x+y \end{bmatrix} = \begin{bmatrix} 3 \\ 6 \end{bmatrix}$ find x and y.

(g) If $Z = 40$, $M = 44$, find \bar{X} .

(h) Let $U = \{1, 2, 3, 4, 5, 6, 7\}$. Does $[\{1, 2, 3\}, \{2, 4\}, \{5, 6, 7\}]$ form a partition? If not why?

(i) State principle of mathematical induction.

(j) What do you understand by Primary data and Secondary data?

SECTION-B

2. In certain examination 53 percent students pass in Economics 61% in Politics, 60% in History, 24% in Economics and Politics, 35% in Politics and History, 27% in Economics and History and 5% passed in none of these subjects. How many students passed in all the three subjects ?

3. Find $(a + b)^4 - (a - b)^4$ and hence evaluate $(\sqrt{3} + \sqrt{2})^4 - (\sqrt{3} - \sqrt{2})^4$.

4. Use the principle of mathematical induction to prove that

$$1 \cdot 2 + 2 \cdot 3 + 3 \cdot 4 + \dots + n(n + 1) = \frac{1}{3} n(n + 1)(n + 2) \quad \forall \quad n \in \mathbb{N}.$$

5. Find the determinant of

$$\begin{bmatrix} x+4 & 2x & 2x \\ 2x & x+4 & 2x \\ 2x & 2x & x+4 \end{bmatrix}$$

6. Explain any two methods of collecting data with their merits and demerits.

7. Obtain the median wage for the following distribution :

| Marks | 20-40 | 40-60 | 60-80 | 80-100 | 100-120 | 120-140 | 140-160 |
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| No. of Students | 4 | 6 | 10 | 16 | 12 | 7 | 3 |