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) Write the set of all vowels in English alphabet which precede's'.

b) Find $x$ and $y$ if $= \{x + 3, 5\} = \{6, 2x + y\}$.



c) Expand by Binomial theorem $(x^2 — 2a)^5$

d) If $f(x) = (x - a)^2 (x - b)^2$, find $f(a + b)$

e) Find the values of the trigonometric ratio $\cos(-480°)$

f) Write the middle term in the expansion of $\left(2x^2 - \frac{1}{x}\right)$

g) If $P(n)$ is the statement $n(n + 1)$ is even, then what is $P(4)$?

h) Solve the matrix equation $\begin{bmatrix}1 & 2 & 1\end{bmatrix}\begin{bmatrix}1 & 2 & 0 & 0\\ 2 & 0 & 1 & 2\\ 1 & 0 & 2 & x\end{bmatrix} = 0$

i) Define Median.

j) Find the co-efficient of $x^4$ in the expansion of $\left(\frac{1-x}{1+x}\right)$

## SECTION-B

2. From the following frequency distribution find the value of the Median

| Marks | No. Of Students |
|---|---|
| Less than 5 | 3 |
| Less than 10 | 20 |
| 5-15 | 37 |
| 15 and above | 60 |
| 20-25 | 20 |
| 25 and above | 5 |
| 30 and above | 1 |

3. Solve the statement by using Principle Mathematical Induction

$$\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+.....+\frac{1}{2^n}+1-\frac{1}{2^n}$$

4. Find a, b, c when $f(x) = ax^2 + bx + c, f(0) = 6, f(2) = 11$ and $f(-3) = 6$.

   Determine the quadratic function $f(x)$ and find its value when $x = 1$.



5. With the help of Binomial Theorem. Prove that the co-efficient of $x^r$ in the expansion

$$(1-4x)^{-1/2} \text{ is } \frac{2r!!}{(r!)^2}$$

6. Let $f = \left\{\left(x, \frac{x^2}{1+x}\right) x \in R\right\}$ be a function from $R$ into $R$. Determine the Range of $f$

7. A survey shows that 63% of the Americans like cheese where as 76% like apples. If $x$% of the Americans like both cheese and apples, find the value of $x$.