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

Total No. of Questions : 07

B.Sc.(IT) (Sem.–1st)

BASIC MATHEMATICS-I

Subject Code : BS-103

Paper ID : [B0402]

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. Write briefly :

(a) Empty set.

(b) Union of sets.

(c) State Binomial Theorem for positive integral index.

(d) Write dual of $(A \cap \mho) \cap (\phi \cup A') = \phi$.

(e) Prove that tan A + cot A = sec A . cosec A.

(f) Construct a 2 × 3 matrix whose elements are given by $a_{ij} = i + 2j$.

(g) Calculate median Height,

Height (in cms) : 72, 62, 54, 75, 40, 52, 77, 70, 45, 47, 55.

(h) Draw a one-way Table.

(i) Insert three geometric means between 3 and 48.

(j) Which term of series 12 + 9 + 6 + ... is equal to – 30 ?

SECTION-B

2. (a) Find $A \cap B$ if $A = \{x : x = 3n + 1, n \leq 5, n \in N\}$ and $B = \{x : x = 4n - 5, n \leq 5, n \in N\}$.

   (b) Find all partitions of $S = \{1, 2, 3\}$.

3. If $\sin \theta = \frac{3}{5}$, θ being an acute angle, find the other t-ratios of the angle θ.

4. (a) Expand $(a + 3b)^4$ using Binomial theorem.

   (b) Find the 10^{th} term in the expansion of $(x - y^2)^{14}$.

5. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$, then find AB and BA. Is AB = BA ?

6. Calculate Mean, Median, Mode for the following data :

Marks more than	:	0	10	20	30	40	50
No. of students	:	50	46	40	20	10	3

7. (a) If the 14^{th} term of an arithmetic series is 6 and 6th term of arithmetic series is 14, find 95^{th} term.

   (b) Sum to n terms the series :

   $7 + 77 + 777 + \ldots$