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

Total No. of Questions : 07

B.Sc.(IT) (Sem.–1)

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 a student has to attempt any FOUR questions.**

SECTION–A

1. Answer the following :

a) Subset

b) Intersection of sets

c) State Binomial theorem for positive integral index.

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

e) Prove that $\sqrt{\frac{1-\sin A}{1+\sin A}} = \sec A - \tan A$.

f) If $A = \begin{bmatrix} 2 & 5 \\ 6 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & -7 \\ 4 & 5 \end{bmatrix}$, Is A + B = B + A?

g) The A.M of 9 items is 15. If one more item is added to this series, the A.M becomes 16. Find the value of 10^{th} item.

h) Draw a two-way table.

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

j) Insert three Geometric means between 3 and 48.

SECTION–B

2. a) Let A = {1, 2, 3, 4, 5, 6}, B = {2, 4, 6, 8}. Find A – B and B – A.

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

3. Prove that $\cos^2 \frac{\pi}{8} + \cos^2 \frac{3\pi}{8} + \cos^2 \frac{5\pi}{8} + \cos^2 \frac{7\pi}{8} = 2$.

4. a) Expand $(1 - x^2)^4$ using Binomial Theorem.

   b) Find the middle term in the expansion of $(x^2 - y)^6$.

5. Write the minor and co-factor of each element of the following determinant and evaluate the determinant :

$$\begin{vmatrix} 1 & 3 & -2 \\ 4 & -5 & 6 \\ 3 & 5 & 2 \end{vmatrix}$$

6. Calculate Mean, Median and 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 7 times the seventh term of an A.P. is equal to 11 times the eleventh term, show that 18^{th} term of A.P. is zero.

   b) Sum to *n* terms the series :

   7 + 77 + 777 + ……..