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

**Total No. of Questions : 07**

**BCA (2013 & Onward)**

**B.Sc.(IT) (2015 & Onward) (Sem.–1)**

# MATHEMATICS – I

**Subject Code : BSIT/BSBC-103**

**M.Code : 10045**

**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 have to attempt any FOUR questions.**

## SECTION-A

**1. Write briefly:**

a) Define 'Equal set' and 'Equivalent set'.

b) Define intersection of two sets.

c) Define Eular Graph.

d) Define Simple graph and give an example.

e) Define Quantifiers.

f) Find $\begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix} + \begin{bmatrix} 1 & 7 \\ 2 & -3 \end{bmatrix}$

g) If $A = \begin{bmatrix} 1 & -3 \\ 2 & 3 \end{bmatrix}$, then find 6A.

h) Find X and Y if $X + Y = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$, $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$.

i) When a function is said to be one-one onto.

j) Define Duality.

## SECTION-B

2. Suppose 100 out of 120 study French, German and Russian. It is given that 65 study French, 45 study German, 42 study Russian, 20 study French and German, 25 Study French and Russian and 15 students study German and Russian. Find the number of students who study all the three languages.

3. State and prove De-Morgan's laws and also shows that Distributive laws holds over three sets.

4. Prove that an undirected graph possesses a eulerian path iff it is connected and has either zero or two vertices of odd degree.

5. Show by method of induction that :

$$1^2 + 2^2 + \ldots + n^2 = \frac{(n)(n+1)(2n+1)}{6}, n \geq 1$$

6. Prove that conjunction distributes over disjunction by using propositional calculus.

7. If $A = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 1 & 4 \\ 1 & 1 & 1 \end{bmatrix}$, find $A^{-1}$.



**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student**.