Exam. Code : 105701

Subject Code : 9033

B.Sc. IT Ist Semester (Old Sylb.—2016)

BASIC MATHEMATICS AND STATISTICS

Paper—III

Time Allowed—3 Hours] [Maximum Marks—75

Note :— (1) Attempt any **five** questions. All questions carry equal marks.

(2) Only non-programmable and non-storage type calculator is allowed.

1. (a) Define :

(i) Complement of a set

(ii) Union of two sets

(iii) Intersection of two sets with an example.

(b) If A = [1, 3, 5, 7, 9] B = [2, 4, 6, 8, 10] C = [1, 2, 3, 4] find :

(i) A-C

(ii) A$\cup$ (B-C)

(iii) A-(B U C).

2. (a) In a group of people 50 speak both English and Hindi and 30 people speak English but not Hindi. All the people speak at least one of two languages. How many people speak English ?

(b) Find Domain and range of relation R

(i) $R = \{(x, y)\ X \in N, Y \in N \text{ and } X + Y = 15\}$

(ii) $R = \{(X,Y)\ X \in N\ \ X < 5\ Y = 3\}$

3. (a) Define :

(i) Reflexive relation

(ii) Inverse relation

(iii) Identity relation

(b) $y = [1 - \cos x]/\sin x$ Find dy/dx

4. (a) $y = (\log x)^{\cos x}$ find dy/dx

(b) $y = (x \cos x)^x$ find dy/dx

5. (a) Evaluate $\int x^2 \log x\, dx$

(b) Evaluate $\int \frac{3x-1}{(x-1)(x-2)(x-3)} dx$.

6. (a) Solve by Matrix Method :

$X + Y + Z = 6$

$X - Y + Z = 2$

$2X + Y - Z = 1$

(b) Solve $\begin{vmatrix} 1 & x & yz \\ 1 & y & zx \\ 1 & z & xy \end{vmatrix} = (x - y)(y - z)(z - x)$.

7. (a) If P(A) = 0.38, P(A U B) = 0.69. Find P(B) if A and B are independent Events.

(b) There are two bags—bag I and bag II

bag I contains 3 white and 2 red balls

bag II contains 5 white and 4 red balls

One ball is drawn at random from one of the bags and found to be red. Find the probability that it was drawn from bag II.

8. (a) Find eigen Value of matrix

$$A = \begin{bmatrix} 1 & 2 & 2 \\ 1 & 2 & -1 \\ -1 & 1 & 4 \end{bmatrix}$$

(b) Verify Cayley Hamilton theorem

$$A = \begin{bmatrix} 3 & 2 & 4 \\ 4 & 3 & 2 \\ 2 & 4 & 3 \end{bmatrix}.$$