BS 35 (NS)

III Semester B.Sc. (I.T.) Examination, June/July 2010
MATHEMATICS – I

Time : 3 Hours Max. Marks : 75

Instructions: *1) Answer* ***all*** *questions in Part – **A**.*
2) Answer ***any five*** *questions in Part – **B**.*

PART – A

I. State whether **true** or **false** : **(1×5=5)**

1) Is it $\sqrt{5}$ is an irrational number.

2) $(A \cup B) \cup C = A \cup (B \cup C)$

3) $6 ! = 720$.

4) $a^m . a^n = a^{m-n}$.

5) Is it cubic equation $ax^4 + 2x^2 + 1 = 0$.

II. 1) Simplify : $6 (x + 1) - 2x$. Justify your steps. **(2×10=20)**

2) Define a open and closed set with example.

3) How many ways can arrange 2 letters from the letters of KSOU.

4) If A = { 1, 2, 3, 4, 5, 7} and B = {2, 5} find (i) $A \cup B$, (ii) $A \cap B$.

5) Solve the linear equation : $9x + 6 = x - 2$.

6) Six boys and six girls sit in a row randomly. Find the probability the six girls sit together.

7) Obtain the mean for the following frequency distribution.

Class	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30
Frequency	6	5	7	4	9	3

8) Solve the linear equation $3x > 2x - 5$.

9) If $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ find 4A – B and AB.

10) Divide $(x^4 - 3x + 5)$ by $(x - 5)$.

P.T.O.

PART – B **(5×10=50)**

III. 1) If A = { x : x ≤ 5 }, B = { x : x ≤ 5 } and C = { x : 2 < x < 6 } for all x ∈ N. then

i) Find the value of $A - (B \cap C)$

ii) Show that $A - (B \cap C) = (A - B) \cup (A - C)$

2) If $A = \begin{bmatrix} 3 & -1 \\ -2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & -1 \end{bmatrix}$ then prove that $(AB)' = B'A'$.

3) Let f : A → B be a function such that $f(x) = x^2 + 2x - 1$ where A = {–2, –1, 0, 1, 2} and B = { 1, 2, 3, ... 19, 20 }. Is the function Injective, Surjective or Bijective.

4) The following table gives the population of India.

Year	1931	1941	1951	1961	1971
Population	275.5	312.1	356.9	439.9	546.9

Represent the above data diagrammatically by bar diagram.

5) Solve : 3x – y = 4, 2x + y = 1.

6) Solve the inequalities simultaneously with the help of graph x + 2y – 2 > 0, y > 0, x > 1.

7) Use completing the square to solve $x^2 - 4x - 8 = 0$.

8) Factorize $x^2 + 7x + 8$ and find its discriminant.

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