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

Total No. of Questions : 07

BCA (Sem.–2)
MATHEMATICS-I(DISCRETE)
Subject Code : BC-203
Paper ID : [B0207]

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 the set operation *Intersection,* give two examples.

    (b) If U= {1,2,3,4,5,……8,9}, A= {1,2,3,4}, B= {2,4,6,8}then find B−A and B^c

    (c) Prove that A∪(B∩C)=(A∪B)∩(A∪C)

    (d) If W= {*Merk, Eric, Paul*} and V= {*David, Eric, Pul)*then find $V \times W$ and W×W

    (e) Describe inverse of the relation "lies above" on the set X of lines in a plane.

    (f) By taking two examples, explain surjective function.

    (g) Find the domain of real valued function $f(x) = \sqrt{9 - x^2}$

    (h) If X has n elements, how many proper subsets does X have?

    (i) What do you mean by Recursive function? Explain by providing suitable examples.

    (j) What do you mean by Hamiltonian graph?

SECTION-B

2. Justify the following statement or else give an example to disprove the result. Let A, B, C be subsets of a set U.

$$(A - C) - (B - C) = (A - B) - C$$

3. Find the recurrence relation and initial conditions for the sequence

$$S \ : \ 0, \ 2, \ 8, \ 26, \ 80, \ …………., \ 3^n - 1, \ …………$$

4. The following relation is defined on the set of real numbers R. Determine whether this relations is reflexive, symmetric or transitive.

$$a \ R \ b \text{ if and only if } 1 + ab > 0$$

5. What is a spanning tree? How would you get a minimum spanning tree? Apply the Kruskal's algorithm to find the minimum spanning tree on the following graph.
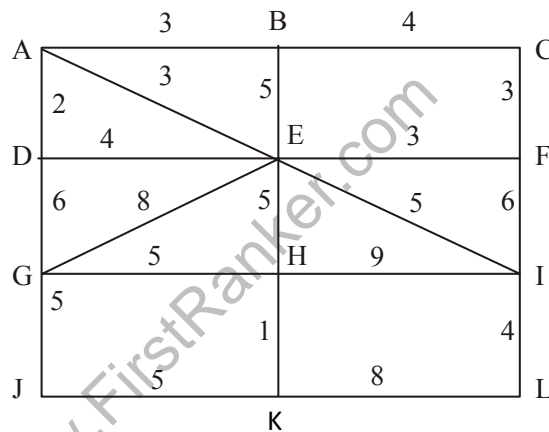

Fig.1

6. What do you mean by Graph traversal? Explain breadth first search by taking one example.
7. What do you mean by Trees? How does a graph differ than a tree? Explain your answer by providing suitable examples.