

Roll No.

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Total No. of Pages : 02

Total No. of Questions : 07

BCA (2010 Batch) (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 Union, give two examples.
- b) If $U = \{1,2,3,4,5,\dots,8,9\}$, $A = \{1,2,3,4\}$, $B = \{2,4,6,8\}$ then find $A-B$ and A^c .
- c) Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
- d) If $W = \{Mark, Eric, Paul\}$ and $V = \{David, Eric, Paul\}$ then find $W \times V$ and $V \times V$
- e) Describe inverse of the relation “is parallel to” on the set X of lines in a plane.
- f) By taking two examples, explain injective function.
- g) Find the domain of the real valued function $f(x) = \sqrt{121 - x^2}$
- h) If set X has 11 members, how many members will be there in $P(X)$? How many members of $P(X)$ are proper subsets?
- i) What do you mean by Generating function? Explain by providing suitable examples.
- j) What do you mean by Eulerian 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 .

$$(A - B)^c = (B - A)^c \text{ (where } A^c \text{ means complement of } A\text{)}$$

3. Construct a truth table for the statement formula

$$A = (p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r) \rightarrow r$$

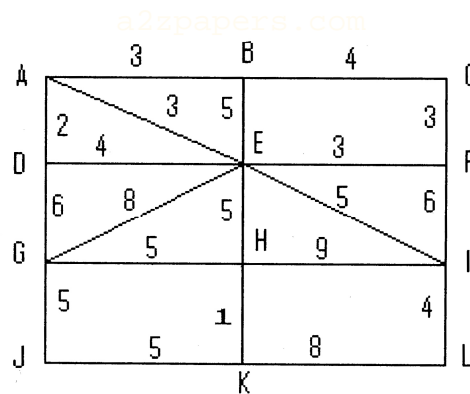
4. Find the recurrence relation and initial conditions for the sequence

$$S: 1, 5, 13, 29, 61, \dots$$

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

$$a R b \text{ if and only if } |a - b| > 0$$

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



7. What do you mean by Graph traversal? Explain depth first search by taking one example.