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Total No. of Questions : 09]   [Total No. of Pages : 02

BCA (Sem. – 2nd)
MATHEMATICS – I (DISCRETE MATHS)
<u>SUBJECT CODE</u> : BC – 203(N$_2$)
<u>Paper ID</u> : [B0207]

Time : 03 Hours   **Maximum Marks : 60**

Instruction to Candidates:

1)   Attempt any **Two** questions from each section A & B.

2)   Section - C is **Compulsory**.

Section - A

(2 × 10 = 20)

Q1) If A and B are any two sets then, show that,$(A \cup B)^c = A^c \cap B^c$

Q2) Show that if R is an equivalence relation on a set A, then so is R^{-1}

Q3) There are 8 doors in a college hall. In how many ways can a student enter the hall and leave it by a different door.

Q4) There are two restaurants next to each other. One has a sign that says, "Good food is not cheap", and other has a sign that says, "Cheap food is not good". Are the signs saying the same thing?
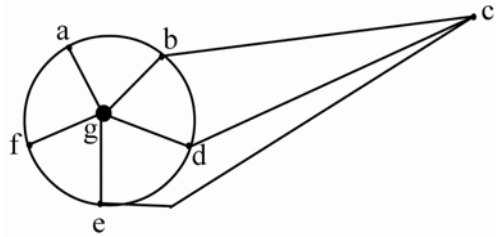
Section - B

(2 × 10 = 20)

Q5) If S(K) – 6S(k – 1) + 8 S (K-2) = 0, K $\geq$ 2 S(0) = 10, S(1) = 25, find the generating function and the sequence which satisfies it.

Q6) Define the terms,

(a) A directed graph.
(b) A Eulerian graph.
(c) A spanning tree.
(d) A binary tree

Give an example in each case.

Q7) Prove that the sum of the degrees of the vertices of the following undirected graph is twice the number of edges in the graph.

Q8) Find the chromatic number of the following graph,

Section - C

(10 × 2 = 20)

Q9)

    (a) If R is the set of real numbers and Q is the set of rational numbers then, what is R – Q?

    (b) If A and B are any two sets then, show that, A – B = A ∩ B′ .

    (c) Give an example of a relation which is reflexive but not symmetric.

    (d) Write the negation of , "If Meena works, then she will earn money".

    (e) What is fundamental principle of counting?

    (f) Define the term, "generating function" and give an example.

    (g) Differentiate between a path and a trail.

    (h) Define a complete bipartite graph and give an example.

    (i) Define a Hamiltonian graph.

    (j) Define a rooted tree.

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