Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

BMCI (2014 & Onwards) (Sem.–1)

MATHEMATICS – I

Subject Code : BMCI-101

M.Code : 72198

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 FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1) Answer briefly :

(a) Find the power set of A = {a, b, c}.

(b) Define Partitioning of set.

(c) Find the domain and range of y = $\sqrt{x-3}$.

(d) Define conjunction.

(e) Prove that $(p \rightarrow q) = \neg q$.

(f) Define equivalence relation.

(g) State and prove First theorem of Graph theory.

(h) Solve the recurrence relation S(n) = 7S(n – 1) – 10S(n – 2).

(i) Define Eulerian graph.

(j) Define Recursion.

SECTION-B

Q2) State and prove De-Morgan's law.

Q3) Prove that intersection of two equivalence relations on a set is an equivalence relation.

Q4) Test the validity: Either I will get good marks or I will not graduate. If I did not graduate I will go to Canada. I get good marks. Thus, I would not go to Canada.

Q5) Show that a simple complete graph with 8n vertices has n(n–1) edges.

Q6) Explain many faces of recursion.

SECTION-C

Q7) There are exactly three types of students in a school: the hockey players, the football players, and the athletes. Each student is classified into at least one of these categories. And the total number of students in the school is 1000. Suppose that the following is given: The total number of students who are the hockey players is 310. The total number of students who are the football players is 650. The total number of students who are athletes is 440. the total number of students who are both the hockey players and the football players are 170. The total number of students who are both the hockey players and athletes are 150.
The total number of students who are both the football players and athletes are 180. What is the total number of students who fit into all 3 categories and the number of students who are only athletes?

Q8) Solve: $S(n) – 4S(n – 1) + 45(n – 2) = 2n$ with initial condition $S(0) = S(1) = 1$.

Q9) Define Tree. State and prove its properties.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.