PVP 14

Code: IT1T4/IT2T7RS

I B.Tech - I Semester – Regular / Supplementary Examinations
November 2018

DISCRETE MATHEMATICS
(INFORMATION TECHNOLOGY)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1.

a) Define well formed formula.

b) Construct the truth table for $\neg(\neg R \wedge \neg S)$.

c) Show that $(x)\left(H(x) \to M(x)\right) \wedge H(s) \Rightarrow M(s)$.

d) Prove that in a lattice (L, ≤), a ≤ b if and only if $a \wedge b = a$.

e) Define Isomorphism of two graphs.

f) State Euler's formula for planar Graphs.

g) Find the number of permutation of letters of the word 'MISSISSIPI'

h) Find the number of non negative integer solutions of equation $x_1 + x_2 + x_3 + x_4 + x_5 = 8$

i) Explain functionally complete set of connectives.

j) Solve the recurrence relation by substitution $a_n = a_{n-1} + n$.

k) Outline the method of characteristic equation method.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Show the following equivalencies without using truth tables. 8 M

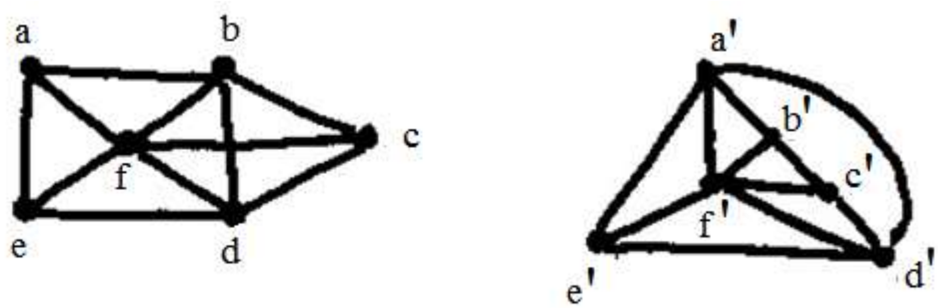
$$\neg(P \wedge Q) \rightarrow (\neg P \vee (\neg P \vee Q)) \Leftrightarrow (P \rightarrow Q)$$

b) Express $P \rightarrow (\neg P \rightarrow Q)$ in terms of $\uparrow$ (NAND) only. Express the same formula in terms of $\downarrow$ (NOR) only. 8 M

3. a) Distinguish direct and indirect method of proof with example. 8 M

b) Let $A = \{a, b, c\}$, $P(A)$ is the power set of A. Let $\subseteq$ be the inclusion relation on the elements of P(A). Draw Hasse diagram of $(P(A), \subseteq)$. 8 M

4. a) Are the following pair of graphs isomorphic. Justify your answer. 8 M



b) Define Adjacency matrix with suitable example. 8 M

5. a) Find the number of 3- digit even numbers with no repeated digits. 8 M

b) How many integers between 1 and 300 (inclusive) are divisible by at least one of 5,6,8. 8 M

6. Explain the Fibonacci Recurrence Relation and find the general solution of Fibonacci Recurrence Relation. 16 M