Code No: 09A30501 R09

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD**

**B.Tech II Year I Semester Examinations, May/June-2013**

**Mathematical Foundation of Computer Science**

**(Common to CSE, IT)**

**Time: 3 hours** **Max. Marks: 75**

**Answer any five questions**

**All questions carry equal marks**

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1.a) Write the converse, inverse, contra positive for the implication "If two angels in triangle are equal then triangle isosceles".

b) Obtain principal conjunctive normal form (PCNF) for the following formula

$p \vee (\sim p \rightarrow (q \vee (\sim q \rightarrow r)))$. [15]

2. Shows that the following set of premises are inconsistent using indirect method of proof:

$P \rightarrow Q$, $Q \rightarrow R$, $\sim (P \wedge R)$, $P \vee R \Rightarrow R$. [15]

3. Draw Hasse diagram representing the partial ordering $\{(A, B): A \leq B\}$ on the power set P(S) where S = {a, b, c) where ≤ represents subset relation. [15]

4. Define group. Show that set of integers are group under addition. [15]

5.a) Find the number of non-negative integral solutions to $x_1+x_2+x_3+x_4+x_5 = 10$.

b) Find the number of arrangements of the letters MISSISSIPPI. [15]

6. Solve the following recurrence relation using generating function

$a_n - 6\ a_{n-1} = 0$ for $n \geq 1$, and $a_0 = 1$. [15]

7.a) What is planar graph? Is $K_{3,3}$ planar? Explain.

b) What is spanning tree? Explain Kruskals algorithm for spanning tree with example. [15]

8.a) In any planar graph, show that $|V| - |E| + |R| = 2$.

b) What is Hamiltonian cycle? Show the Hamiltonian cycle in $K_5$. [15]

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