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 $\leq$ 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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