

R09

Code No: 09A30501

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**

- 1.a) Write the converse, inverse, contra positive for the implication "If two angles 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]

---oo00o---