Code: R7 210502

R7

B.Tech II Year I Semester (R07) Supplementary Examinations, May 2012

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(Common to CSE, IT and CSS)

Time: 3 hours Max Marks: 80

Answer any FIVE questions

All questions carry equal marks

*****

1 (a) What is a well formed formula? Give examples.
(b) Show the following implications without using truth table
(i) $(P \rightarrow Q) \Rightarrow P \rightarrow (P \wedge Q)$
(ii) $(P \rightarrow Q) \rightarrow Q \Rightarrow (P \vee Q)$

2 (a) Explain about automatic theorem proving with example.
(b) Show that $R \wedge (P \vee Q)$ is a valid conclusion from the premises $P \vee Q$, $Q \rightarrow R$, $P \rightarrow M$ and $\sim M$.

3 (a) Define binary relation. Explain the properties of binary relation.
(b) Define a partial order relation let A= {a, b, c, d} and P(A) be power set of A. Draw Hasse diagram for <P(A), $\underline{C}$ > when $\underline{C}$ is inclusion relation on the elements of A.

4 (a) Explain about homomorphism of sub groups.
(b) When do you call an algebraic system is a group? Give an algebraic system which is a group and prove that it is a group.

5 (a) How many 10-digit binary numbers are there with exactly six I's?
(b) State and prove the binomial theorem.

6 (a) In $(1 + x^5 + x^9)^{10}$ find the coeffients of x^{23} and x^{32}.
(b) Solve the equation $a_r - 5a_{r-1} + 6a_{r-z} = 1$.

7 Explain any two methods for finding out the minimum spanning tree of a given graph with suitable examples.

8 (a) Explain about multigraphs and Euler circuits with examples.
(b) Write the applications of graph theory.

*****