

Code: 9A05301

R09

B.Tech II Year I Semester (R09) Supplementary Examinations, May 2013

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(Common to CSS, IT and CSE)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

- 1 Which of the following proposition are true and which are false? Give reasons:
(a) If the earth is round then the earth travels round the sun.
(b) If Alexander Graham Bell invented telephone, then tigers have wings.
(c) If tigers have wings, then RDX is dangerous.
- 2 With reference to automatic theorem proving, show that SVR is tautologically implied by $(p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow s)$.
- 3 (a) Consider $F : \mathbb{Z}^+ \rightarrow \mathbb{Z}^+$ define by $f(a) = a^2$ check if f is one – to-one and in- to using suitable explanation.
(b) Let the function f & g are defined by $f(x) = 2x + 1$ and $g(x) = x^2 - 2$ is $f \circ g = g \circ f$.
- 4 If $(G, *)$ and (H, Δ) are two groups and $f: G \rightarrow H$ is Homomorphism, then prove that kernel is a normal function.
- 5 Find the recurrence relation for generating Fibonacci series and solve the relation.
- 6 (a) How many ways can we get a sum of 8 when two indistinguishable dice are rolled?
(b) What is the coefficient of x^3y^7 in $(x+y)^{10}$?
- 7 (a) Explain the properties of path matrix.
(b) What do you mean by graph traversal? Explain the different graph traversal techniques with an example.
- 8 Define the following with an example:
(i) Cycle graph. (ii) Path graph.
(iii) Null graph. (iv) Sub graph.
(v) Tree.
