

Code: R7210502

B.Tech II Year I Semester (R07) Supplementary Examinations December 2015

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(Common to CSE, IT & CSS)

(For 2008 Regular admitted batch only)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What is a normal form? Write and explain about CNF and PCNF with an example for each.
(b) Define contingency with a truth table.
- 2 (a) Write in detail about predicate logic.
(b) What do you mean by indirect method of proof? Explain with example.
- 3 (a) Define pigeonhole principle and give any two applications.
(b) What is primary relation? What are the operations that can be performed on binary relations? Explain.
- 4 (a) Explain the properties of monoids and semi-groups with example.
(b) Prove that a group G is Abelian if and only if $(ab)^2 = a^2b^2$ for all $a, b, \in G$.
- 5 (a) In how many ways can a president and vice president be chosen from a set of 30 candidates?
(b) Find the coefficient of $x^9 y^3$ in the expansion of $(2x - 3y)^{12}$.
- 6 (a) Solve the recurrence relation: $T(k) = 2T(k-1)$, $T(0) = 1$.
(b) Define a generating function with an example.
- 7 Explain Kruskal's and Prim's algorithm for minimum spanning trees.
- 8 (a) Define Hamiltonian circuit and Euler's path.
(b) Explain with an example the isomorphism of two graphs.
