

II B.Tech I Semester Supplementary Examinations, November 2006
DISCRETE MATHEMATICAL STRUCTURES
(Computer Science & Systems Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Describe any Five normal forms.
 (b) Describe universal quantifier and Existential quantifier. With your own example. [8+8]
2. (a) Define Logic Programming and Explain various Logic Programming Techniques.
 (b) Obtain the Principle disjunctive normal form of the statement $Q \wedge (P \vee Q)$ [8+8]
3. (a) Show that every finite semigroup has an idempotent.
 (b) Show that the set of all invertible elements of a monoid form a group under the same operation as that of the monoid. [8+8]
4. (a) Convert the following infix expression in to prefix and Postfix expressions.
 $D * (E - g) * H - I * g + A$
 (b) Describe basic concepts of set theory. [10+6]
5. (a) Prove that if l_1 and l_2 are elements of lattice (L, \vee, \wedge) then
 $(l_1, \vee l_2 = l_1) \leftrightarrow (l_1 \wedge l_2 = l_2) \leftrightarrow (l_2 \leq l_1)$
 (b) Show that if a Poset L has a least element (greatest element) then this least (greatest) element is unique. [8+8]
6. Minimize the following expressions:
 (a) $AB\bar{C}D + ABC\bar{D} + B\bar{C}D + \bar{A}BC\bar{D}$
 (b) $B\bar{C}D + A\bar{C}\bar{D} + AB\bar{C}D + A\bar{B}\bar{C}D$
 (c) $(A + B + \bar{C})(\bar{A} + B + \bar{C})$ [5+5+6]
7. (a) Describe the concept of theorem proving with Resolution.
 (b) Explain the concept Automatic reasoning with your own example. [8+8]
8. Write short notes on any three of the following:
 (a) Predicate calculus
 (b) Theory of inference
 (c) Binary relations
 (d) Representation of discrete structures. [5^{1/3}each]
