Symbolic Logic & logic Programming
(CS, Dec-2007)

Note: Section A is compulsory. Attempt any four questions from Section-B and any two from Section-C.

Section-A

1. a) What do you mean by term Inference?
   b) What is operational semantics?
   c) What is a meta interpreter?
   d) What is the language of predicate calculus?
   e) What do you mean by static database of prolog?
   f) What is a semantic network?
   g) What is an Expert System?
   h) Define the term recursion.
   i) Write the recursive definition of a LIST.
   j) What do you mean by redundancy of the solution to the quesies?

Section-B

2. Define the term propositional calculus. Differentiate between a well formed and not a well formed formula with the help of a suitable example.
3. Show that ~PVQ and P→Q are logically equivalent using truth Table.
4. Translate the following English sentences into predicate Logic.
   (a) Everyone is loyal to someone.
   (b) All Romans were either Loyal to Caesar or hated him.
   (c) For every number, there is one and only one immediate successor.
   (d) There is no number for which O is immediate successor.
   (e) For every number other than 0, there is one and only one immediate predecessor.
5. Ancestor X of Y is defined as "if X is parent of Y or if X is parent of Z who is ancestor of Y" write prolog program.
6. Describe FAIL Predicate with the help of a suitable example.

Section-C

7. What are logical limitations of PROLOG? Write a prolog Program using Cut for Quick sort.
8. Write an iterative and recursive program to Prolog to add the elements of a given list of integers.
9. Write short notes on:
   (a) Fuzzy Logic Neural networks
   (b) Normal Forms