Exam. Code : 208601
Subject Code : 4698

M.Sc. (IT) Semester—I

MIT-105 : SYMBOLIC LOGIC AND LOGIC PROGRAMMING

Time Allowed—3 Hours] [Maximum Marks—100

Note :– Attempt any **five** questions. All questions carry equal marks.

1. (a) What do you understand by Syntax and Semantics of Prepositional Logic ?

   (b) Construct the truth table of the formula

   $$((A \Rightarrow B) \wedge (B \Rightarrow C)) \Rightarrow (A \Rightarrow C).$$

2. (a) Convert the formula $(P \vee \sim R) \vee (Q \wedge R)$ to Conjunctive Normal Form (CNF) and Disjunctive Normal Form (DNF).

   (b) How is world knowledge represented using prepositional logic ? Explain with the help of two examples.

3. (a) Translate the text "Every man is mortal. Hari is a man. Therefore, Hari is mortal" into a First Order Predicate Calculus (FOPC).

   (b) What is **Clause Normal Form** ? How will you get it from FOL ? Explain by an example.

4. (a) What are the rules for representing variable and predicate in Prolog ?

   (b) Differentiate between the usage of 'is' and '=' operators in Prolog.

5. Explain the basic control strategies of Prolog with example(s).

6. What is meant by operational behavior of cut ? Explain with an example.

7. Describe the salient features of Prolog.

8. Write short notes on any **two** of the following :

   (a) Validity and consequence of prepositional logic

   (b) Prolog Execution Model

   (c) Recursion.