**Quiz: Logical Agents and Inference in AI**

**Course Code:** CS3151  
**Topic:** Logical Agents and Inference Mechanisms  
**CLO:** CLO1 – Understand the key components in the field of artificial intelligence  
**Total Marks:** 20  
**Submission Deadline:** 28-06-2025

**Question 1: Logical Agents and Knowledge Representation (5 marks)**

a. What is a logical agent? How does it differ from a simple reflex agent?  
b. Define a knowledge base. How is it used by logical agents?  
c. Briefly explain the role of logic in AI problem-solving.

**Question 2: Wumpus World (5 marks)**

a. Describe the Wumpus World environment and its importance in AI.  
b. How do knowledge-based agents make decisions in the Wumpus World?  
c. Explain how logical inference helps an agent safely navigate the Wumpus World.

**Question 3: Inference Rules – Modus Ponens and Modus Tollens (4 marks)**

a. Define modus ponens and modus tollens with examples.  
b. How are these rules applied in a knowledge-based agent system?  
c. Give one real-life AI situation where these inference rules could apply.

**Question 4: Satisfiability and Chaining Techniques (6 marks)**

a. What is satisfiability in propositional logic, and why is it significant in AI?  
b. Differentiate between forward chaining and backward chaining with examples.  
c. Explain a situation where backward chaining is more effective than forward chaining.