PRACTICE PAPER 2

Artificial Intelligence

Paper / Subject Code: 48893

Time: 3 hours **Max. Marks: 80**

Note: (1) Question 1 is compulsory.
(2) Answer any three out of remaining questions.
(3) Assume suitable data where required.

Q. 1 - Solve any 4 [20 marks]

a) Write PEAS descriptor for online English tutor. **[05]**

b) Explain problems faced by Hill Climbing algorithm. **[05]**

c) Discuss different applications of AI in the field of healthcare. **[05]**

d) Write a PROLOG program for factorial of given number. **[05]**

e) Define AI. List the major applications of AI. **[05]**

Q. 2 [20 marks]

a) Give the comparative analysis of BFS, DFS, Iterative Deepening, and Bidirectional Search Strategies with respect to Time Complexity, Space Complexity, Optimality, and Completeness. Create a comparison table. **[10]**

b) Explain the Expert Systems along with its Components. Give real life examples of Expert systems. **[10]**

Q. 3 [20 marks]

a) What is problem formulation? Formulate 8-Puzzle problem in terms of: initial state, actions, successor function, goal test, and path cost. Explain a heuristic function for 8-puzzle problem. **[10]**

b) Compare and contrast Simulated Annealing with Hill Climbing algorithm. Explain how simulated annealing overcomes limitations of hill climbing. **[10]**

Q. 4 [20 marks]

a) "As per the law, it is a crime for an American to sell weapons to hostile nations. Country A, an enemy of America, has some missiles, and all the missiles were sold to it by Robert, who is an American citizen."

Prove that "Robert is criminal" using forward and backward chaining. **[10]**

b) Explain different inference rules for First Order Predicate Logic with examples. **[10]**

Q. 5 [20 marks]

a) Explain Bayes Theorem with example. In a class, there are 80% of the students who like English and 30% of the students who like both English and Mathematics. What is the percentage of students who like Math and also like English? **[10]**

b) Explain Iterative Deepening Search Algorithm based on performance measure. Compare with Depth Limited Search. **[10]**

Q. 6 [20 marks]

a) Explain different types of learning in AI: Supervised Learning, Unsupervised Learning, Reinforcement Learning with examples. **[10]**

b) Explain Total Order Planning in detail with suitable example. **[10]**
