

Time: 3 hours

Max. Marks: 80

- N.B.: (1) Question No. 1 is Compulsory.
 (2) Attempt any three questions out of the remaining four.
 (3) Each question carries 20 marks and sub-question carry equal marks.
 (4) Assume suitable data if required.

- Q.1. 20
- A Explain structure of goal based agent. 5
 - B List properties of environment. Give suitable examples. 5
 - C Explain, in brief, performance evaluation measures of search algorithms. 5
 - D Define following terms with respect to Genetic Algorithm: Initial population 5
 Fitness function
 Selection
 Crossover
 Mutation
- Q.2. 20
- A Explain depth first search algorithm. Discuss merits and demerits of depth first search algorithm. 5
 - B What is alpha-beta pruning. Give suitable example. 5
 - C A* algorithm is complete and optimal. Justify. 5
 - D Explain Hill climbing algorithm with challenges. 5
- Q.3. 20
- A Explain forward chaining algorithm. Also, discuss how limitations of forward chaining algorithm are addressed in backward chaining algorithm. 10
 - B Look at the following sentences and decide for each if it is valid, unsatisfiable, or neither. 5
 Smoke \Rightarrow Smoke
 Smoke \Rightarrow Fire
 (Smoke \Rightarrow Fire) \Rightarrow (\neg Smoke \Rightarrow \neg Fire)
 Smoke \wedge Fire \wedge \neg Fire
 (Big \wedge Dumb) \vee \neg Dumb
 - C How you will represent change in world using FOPL. 5

- Q.4. A What is partial order planning? Explain with suitable example. 5
B Explain the architecture of an Expert system in detail. 10
C Explain the terms: Prior and Posterior probability. How these probabilities can be used for handling uncertainty? 5
- Q.5. 20
A Discuss inference using full joint distribution with suitable example. 10
B Consider the following problem: 10
The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American.
Prove that West is criminal using backward chaining.
- Q.6. Write short note on 20
A Structure of an artificial agent. 5
B Reinforcement learning. 5
C Bayesian belief network. 5
D Issues in knowledge representation 5
