18/11/2024 CSE-AIML SEM-V C SCHEME AI QP CODE: 10066783

[3 hrs] [80 Marks]

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

Q1 Solve any 4

a) Describe the PEAS descriptor for AI agent-based Movie Ticket Booking System 5

b) Write the Environment properties of the Pacman Game 5

c) Describe an Intelligent Agent with a neat diagram. 5

d) Differentiate between supervised and unsupervised learning 5

e) Convert in to FOPL 5

- EVERYONE LIKE EVERYONE
- ALL GRADUATES ARE UNEMPLOYED

Q2

a) Give the comparative analysis of BFS, DFS, Iterative Deepening, and Bidirectional Search Strategies with respect to Time Complexity, Space Complexity, Optimality, and Completeness 10

b) Describe the Hill Climbing algorithm with an example. Discuss its inherent limitations, and propose effective solutions to address those limitations 10

Q3

a) Consider the following statements. 10

(a) Ravi likes all kind of food.
(b) Apple and Chicken are food.
(c) Anything anyone eats and is not killed is food.
(d) Ajay eats peanuts and still alive.
(e) Rita eats everything that Ajay eats.

Prove that Ravi likes Peanuts using **Resolution**.

b) Explain Total Order Planning and Partial Order Planning in detail. 10

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Q4

a) Explain Bayesian Belief Network with example 10

b) Define the initial and goal state of three missionaries and cannibals problem. Describe the set of operators using if-then rules. 10

Draw the entire state space graph (include only legal states, that is, states in which cannibals do not outnumber missionaries on either side of the river). State best searching algorithm for it

Q5

a) Explain Genetic Algorithm in detail with suitable example. 10

b) Explain a heuristic function for an 8-puzzle problem and solve it using A* algorithm? 10

Q6

a) Epidemiologists claim that the probability of breast cancer among Caucasian women in their mid-50s is 0.005. An established test identified people who had breast cancer and those that were healthy. A new mammography test in clinical trials has a probability of 0.85 for detecting cancer correctly. In women without breast cancer, it has a chance of 0.925 for a negative result. If a 55-year-old Caucasian woman tests positive for breast cancer, what is the probability that she, in fact, has breast cancer? 10

b) Explain reinforcement learning with example. 10

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