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Code No: CT3521

SRGEC-R20

II B.Tech II Semester Regular Examinations, July 2022

ARTIFICIAL INTELLIGENCE

(Artificial Intelligence and Data Science)

Time: 3 Hours

Max. Marks: 70

Note: Answer one question from each unit.

All questions carry equal marks.

5 × 14 = 70M

UNIT-I

1. a) Show that the Tic – Tac - Toi problem can be classified under the area of Artificial Intelligence. Give the solution representation of this problem using Artificial Intelligence. (6M)

- b) Describe with necessary diagrams, a suitable state space representation for water jug problem and explain how the problem can be solved by state space search. Show how heuristic can improve the efficiency of search. (8M)

(OR)

2. a) Discuss in detail about “knowledge-based systems: The key to power”. (10M)

- b) Write short notes on how AI became an industry? (4M)

UNIT-II

3. a) With a suitable example describe the Greedy Best first Search algorithm. (7M)

- b) List and explain the properties of the heuristic search algorithms. (7M)

(OR)

4. a) Differentiate between Depth-First Search and Breadth First Search with examples. (7M)

- b) With an example elaborate on search with open list and closed list. (7M)

UNIT-III

5. a) What is meant by full joint distribution? How representing the full joint distribution helps in construction of Bayesian networks? (7M)

- b) Give a brief description on Hidden Markov Model. (7M)

(OR)

6. a) By applying Baye’s rule solve this instance that “Covid-19 tests are common nowadays, but some results of tests are not true”. Let’s assume; a diagnostic test has 99% accuracy and 60% of all people have Covid-19. If a patient tests positive, what is the probability that they actually have the disease? (7M)

b) Given the assumption

Today's Weather		Tomorrow's Weather		
		Sunny	Rainy	Cloudy
	Sunny	0.8	0.05	0.15
	Rainy	0.2	0.6	0.2
	Cloudy	0.2	0.3	0.5

From the given assumption It is given that "today is Cloudy", what is the probability that it will be rainy two days from now using Markov Model? (7M)

UNIT-IV

7. a) What is MDP? Explain the components that define MDP. (6M)
- b) What is optimal policy? Describe an optimal policy for the stochastic environment with $R(s) = -0.04$. (8M)

(OR)

8. Explain why value iteration eventually converges to a unique set of solutions of the Bellman equations. (14M)

UNIT-V

9. a) Explain how the agent executes a set of trials in the environment using its policy π . (7M)
- b) Justify how direct utility estimation succeeds in reducing the reinforcement learning problem to an inductive learning problem. (7M)

(OR)

10. Write in detail about the method for direct utility estimation. (14M)
