Code No: CT3521   **SRGEC-R20**

II B.Tech II Semester Supplementary Examinations, January 2023
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.

$5 \times 14 = 70M$

UNIT-I

1. a) What is meant by PEAS model for AI agent? Describe the PEAS model for the problem "Self Driving Cars". (7M)

   b) List and explain the components that are involved in problem formulation or definition. (7M)

(OR)

2. a) Describe about search trees with an example. (7M)

   b) What is meant by Rationality and Rational Agent? Explain how agents can interact with environment using sensors and actuators. (7M)

UNIT-II

3. Explain BFS and DFS and develop algorithms for them. List down the advantages and disadvantages of both. (14M)

(OR)

4. a) In what kind of problems the Breadth first search be better than a depth first search? (7M)

   b) By applying Informed search algorithm / Heuristic search draw the state space tree for 8 puzzle problem and show that how h(n) can be minimized to zero with an example. (7M)

UNIT-III

5. a) What is meant by Conditional Probability? In what applications it can be used? (7M)

   b) Explain how filtering and prediction can be done in Temporal model with an example. (7M)

(OR)

6. a) Discuss in brief about a method for constructing Bayesian network. (7M)

   b) Give a brief note on conditional probability. (7M)

UNIT-IV

7. a) Explain the following (i) Utility (ii) Utility function (iii) Utility of state. (8M)

   b) Write value iteration algorithm. (6M)

(OR)

8. Explain the following: (14M)

   (i) Definition of POMDP.

   (ii) Decision cycle of a POMDP agent.

   (iii)Calculating the probability that an agent in belief state b reaches belief state lit after executing action a.

UNIT-V

9. a) Differentiate passive learning and active learning. (6M)

   b) Illustrate a policy π for the 4 x 3 world and utilities for rewards of R(s) = - 0.04 in the non-terminal states and no discounting. (8M)

(OR)

10. a) Write the pseudo code a passive reinforcement learning agent that learns utility estimates using temporal differences. (8M)

    b) Draw the passive ADP learning curves for the 4 x 3 world, given the optimal policy. (6M)

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