C **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: R4E02

B.E. / B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Fourth Semester

Artificial Intelligence and Data Science

R21UAD402- ARTIFICIAL INTELLIGENCE

(Regulations R2021)

(Common to CSE (AIML) Engineering Branches)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. What is the function of an Artificial Intelligence "Agent"? CO1-U

   (a) Mapping of goal sequence to an action

   (b) Work without the direct interference of the people

   (c) Mapping of precept sequence to an action

   (d) Mapping of environment sequence to an action

2. Which method is effective for escaping from local minima? CO1-U

   (a) Updating heuristic estimate (b) Reducing heuristic estimate

   (c) Eliminating heuristic estimate (d) None of the mentioned

3. Which is not a property of representation of knowledge? CO1-U

   (a) Representational Verification (b) Representational Adequacy

   (c) Inferential Adequacy (d) Inferential Efficiency

4. To eliminate the inaccuracy problem in planning problem or partial order planning problem we can use _____ data structure/s. CO1-U

   (a) Stacks (b) Queue

   (c) BST (Binary Search Tree) (d) Planning Graphs

5. Which of the following is incorrect Expert Systems Limitations? CO1-U

   (a) Limitations of the technology (b) Difficult knowledge acquisition

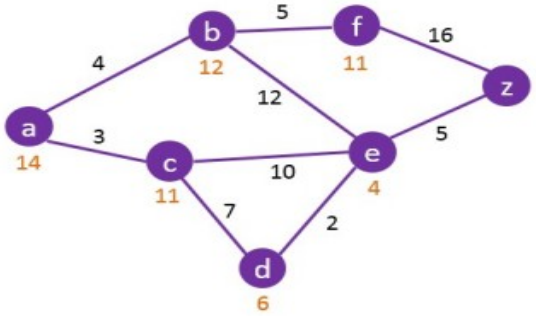
   (c) Easy to maintain (d) High development costs

PART – B (5 x 3= 15 Marks)

6.	Write short notes on the Turing test approach to act humanly.	CO1-U	
7.	Give the importance and use of local maxima, global maxima with respect to hill climbing algorithm.	CO1-U	
8.	How can a frame representation be used to represent a car's attributes, such as make, model, and color?	CO1-U	
9.	What is the purpose of the SSS* algorithm?	CO1-U	
10.	Mention any two AI applications in autonomous vehicles.	CO1-U	

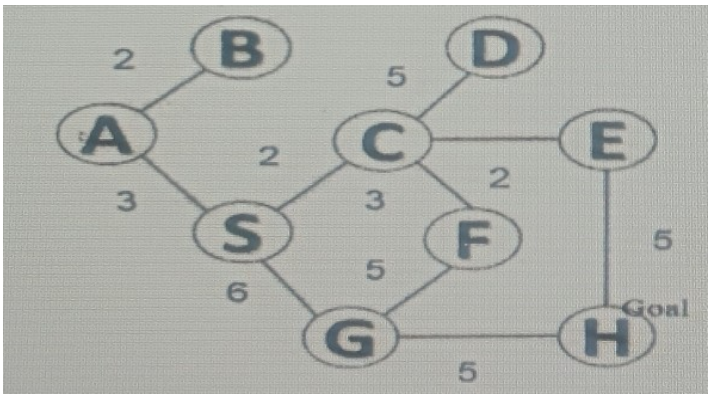
PART – C (5 x 16= 80 Marks)

11.	(a)	Consider a scenario where you have a 3-liter jug and a 5-liter jug, and you need to measure precisely 4 liters of water. Visualize the scenario by imagining the two jugs and a water source to fill them. Solve the Water Jug Problem algorithm in AI in these segments provides a clear understanding of the problem's basic concept and sets the stage for participants to engage with the problem-solving process.	CO3-Ana	(16)
		Or		
	(b)	Develop a PEAS description of task environment for each of the following agents. (i) Satellite Image Analysis System (8) (ii) Interactive English Tutor (8)	CO3-Ana	(16)
12.	(a)	Consider the search problem below with start state S and goal state G. The transition costs are next to the edge and the heuristic values are next to the states. What is the final cost using A* Search?	CO2-App	(16)



Or

(b) Consider the graph given in figure below. Perform BFS, DFS and Uniform Cost Search strategies on the following graph and also formulate the algorithm for any 2 strategies. CO2-App (16)



13. (a) Explain Resolution in First Order Logic with an example. CO1-U (16)

Or

(b) Explain briefly and CompareSemantic Network, Frame Representation, and Production Rules. CO1-U (16)

14. (a) Explain the concept of a planning graph with an example. CO1-U (16)

Or

(b) Explain Plan Space Planning in detail with advantages and disadvantages. CO1-U (16)

15. (a) Explain information retrieval and its techniques with examples. CO1-U (16)

Or

(b) Describe AI applications in business and their impact on decision-making. CO1-U (16)