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14SCS24

Second Semester M.Tech Degree Examination, June/July 2015
Artificial Intelligence and Agent Technology

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Define AI and discuss any two applications of AI. **(05 Marks)**

b. You are given two water jugs, a 6 – gallon one and 8 – gallon one. Neither of the jugs has measuring marks on them. There is a pump that can be used to fill the jugs with water. How can you get exactly 4 – gallons of water into 8 – gallons jug? Define the problem as a state space and solve the problem using state space approach. **(09 Marks)**

c. Discuss any two characteristics of AI problems in detail with examples. **(06 Marks)**

2 a. With examples, describe any three properties of task environments. **(06 Marks)**

b. Given the following initial and goal configuration of 8 – puzzle problem, use the Best - First search method to obtain solution path from initial to goal configuration. Specify the heuristic function used. **(06 Marks)**

2	8	3
1	6	4
7		5

Initial State

1	2	3
8		4
7	6	5

Goal State

c. Explain in detail the following issues in representation of knowledge.
i) Relationship among attributes ii) Finding right structures as needed. **(08 Marks)**

3 a. Consider the following set of sentences. Represent them in predicate logic, convert them to clause form and prove the statement hate (marcus, Caesar) using resolution.
i) Marcus was a man ii) Marcus was a Pompeian iii) All Pompeian's were Romans.
iv) Caesar was a ruler v) All Romans were either loyal to Caesar or hated him
vi) Everyone is loyal to someone vii) People only try to assassinate ruler's they are not loyal to viii) Marcus tried to assassinate Caesar. **(12 Marks)**

b. Explain in detail construction of circuit based agents that operate using propositional logic. **(08 Marks)**

4 a. With a diagram, describe non -- monotonic reasoning. **(04 Marks)**

b. Describe the following types of non – monotonic reasoning, with an example for each :
i) Abduction ii) Inheritance. **(06 Marks)**

c. State Baye's theorem and describe with an example how to perform reasoning using Baye's network mechanism. **(10 Marks)**

5 a. Explain probabilistic inference using full joint distribution with an example. Also write algorithm for the same. **(10 Marks)**

b. Describe in detail representation of knowledge as a Frame, considering an example. **(06 Marks)**

c. Write algorithm for property inheritance used in weak slot - & - filler structures. **(04 Marks)**

6 a. Write a script for going to a restaurant. **(10 Marks)**

b. With an example show that Alpha – Beta pruning method saves the search space. **(10 Marks)**

7 a. List various types of learning methods and briefly explain them. **(10 Marks)**
b. With an example, discuss learning from decision trees. **(10 Marks)**

8 Write short notes on the following :
a. Conjunctive Normal Form.
b. Implementation issues in non - monotonic reasoning.
c. EM algorithm.
d. Goal based agents. **(20 Marks)**

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