CBCS SCHEME

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17CS562

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
Artificial Intelligence

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define artificial intelligence. Explain different characteristics of the AI problems used for analyzing it to choose most appropriate method. **(08 Marks)**

b. A water jug problem states "you are provided with two jugs first one with 4-Gallon capacity and the second one with 3-Gallon capacity. Neither have any measuring markers on it. How can you get exactly 2 gallons of water into 4-gallon jug?
(i) Write down the production rules for the above problem.
(ii) Write any one solution to the above problem. **(10 Marks)**

c. What is production system? **(02 Marks)**

OR

2 a. Explain how AND-OR graphs are used in problem reduction. **(08 Marks)**

b. What are the issues with Steepest Hill Climbing? Briefly explain Simulated Annealing algorithm. **(08 Marks)**

c. Bring out differences between Breadth-First Search and Depth-First Search algorithm. **(04 Marks)**

Module-2

3 a. Explain different approaches to knowledge representation. **(10 Marks)**

b. Convert the following set of well formed formulas in predicate logic:
(i) Man (Marcus)
(ii) Pompeian (Marcus)
(iii) $\forall x$: Pompeian (X) $\rightarrow$ Roman (X)
(iv) Ruler (Caesar)
(v) $\forall x$: Roman (x) $\rightarrow$ loyalto (X, Caesar) V hate (X, Caesar)
(vi) $\forall x$: y loyalto (x, y)
(vii) $\forall x$: $\forall y$ Man (x) $\wedge$ Ruler (y) $\wedge$ Tryassassinate (X, Y) $\rightarrow$ loyalto (X, Y)
(viii) Tryassassinate (Marcus, Caesar)
Convert these into clause form and prove that hate (Marcus, Caesar) using resolution proof. **(10 Marks)**

OR

4 a. Explain in detail about Forward and Backward Reasoning. **(06 Marks)**

b. What is Matching in rule based system? Briefly explain different proposals for matching. **(08 Marks)**

c. List the issues in knowledge representation. **(06 Marks)**

Module-3

5 a. What are the key issues which needs to be addressed by non-monotonic reasoning system? Explain. **(10 Marks)**

b. Write short notes on:
   (i) Default logic
   (ii) Closed World Assumption
   (iii) Justification Based Truth Maintenance System (10 Marks)

OR

6 a. Write short notes on Bayesian Network with an example. (08 Marks)
b. Explain Dempster Shafer Theory with a suitable example. (08 Marks)
c. Draw a partitioned semantic network for "Every dog has bitten Every Mail Carrier". (04 Marks)

Module-4

7 a. Explain important components of script with an example. (06 Marks)
b. What is conceptual dependency? List the rules of conceptual dependency. (08 Marks)
c. Write short notes on:
   (i) CYCL
   (ii) Global Ontology (06 Marks)

OR

8 a. Write a note on Iterative Deepening. (06 Marks)
b. Show conceptual Dependency Representation of the sentences:
   (i) John sold his car to Bill
   (ii) John killed Mary (06 Marks)
c. Explain the MINIMAX Algorithm. (08 Marks)

Module-5

9 a. What is Natural Language Processing? Explain different steps in NLP in detail. (10 Marks)
b. Write short notes on:
   (i) Conceptual parsing
   (ii) SPELL checking (10 Marks)

OR

10 a. What is an Expert System? Explain about Knowledge Aquisitions. (08 Marks)
b. Write in detail about Explanation based learning. (06 Marks)
c. Define analogy. Explain two methods of Analogical problem solving in AI. (06 Marks)

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