15CS562

USN ☐☐☐☐☐☐☐☐☐☐

Fifth Semester B.E. Degree Examination, July/August 2021
Artificial Intelligence

Time: 3 hrs.   Max. Marks: 80

Note: *Answer any FIVE full questions.*

1   a. Discuss Program 1 and Program 2 with respect to Tic-Tac-toe game.   **(08 Marks)**
    b. A water Jug problem states "You are given two jugs, a 4-gallon one and a 3-gallon one. Neither has any measuring markers on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug"?
       (i)   Write down the production rules for the above problem.
       (ii) Write any one solution to the above problem.   **(08 Marks)**

2   a. Explain Depth First Search (DFS) and Breadth First Search (BFS) algorithm.   **(08 Marks)**
    b. Explain simple hill climbing and steepest ascent hill climbing algorithm.   **(08 Marks)**

3   a. Discuss the various approaches of knowledge representation.   **(08 Marks)**
    b. Write well-formed-formulas (wff's) in predicate logic for the given facts:
       (i)   Marcus was a man.
       (ii)   Marcus was a Pompeian.
       (iii) All Pompeians were Roman.
       (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 rules they are loyal to.
       (viii) Marcus tried to assassinate Caesar.   **(08 Marks)**

4   a. Write an algorithm to convert well-formed formulas (wff's) into clause form.   **(08 Marks)**
    b. Write a short note on procedural knowledge and declarative knowledge.   **(08 Marks)**

5   a. Discuss the concept of uncertainity with the help of ABC murder story.   **(08 Marks)**
    b. Explain Baye's theorem.   **(08 Marks)**

6   a. Write an algorithm for property inheritance.   **(08 Marks)**
    b. Apply Baye's theorem for a given problem.
       Problem : Marie's marriage is tomorrow.
       (i)   In recent years, each year it has rained only 5 days.
       (ii)   The weatherman has predicted rain for tomorrow.
       (iii) When it actually rains, the weatherman correctly forecast rain 90% of the time.
       (iv)   When it doesn't rain, the weatherman incorrectly forecasts rain 10% of the time.
       The question : What is the probability that will rain on the day of Marie's wedding?   **(08 Marks)**

7   a. Explain Conceptual Dependency (CD).   **(08 Marks)**
    b. Explain the components of a script with an example.   **(08 Marks)**

8   a. Explain MINMAX search procedure.   **(08 Marks)**
    b. Explain alpha-beta cutoffs.   **(08 Marks)**

9   a. Explain various steps involved in natural language processing.   **(08 Marks)**
    b. Explain candidate elimination algorithm.   **(08 Marks)**

10 a. Mention any four major problems with respect to current expert system.   **(08 Marks)**
    b. Discuss various learning strategies.   **(08 Marks)**

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