M. Tech. (Sem. - 3rd)
ARTIFICIAL INTELLIGENCE
SUBJECT CODE : CS - 510
Paper ID : [E0696]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours   **Maximum Marks : 100**

Instruction to Candidates:

1) Attempt any **Five** questions.

2) **All** questions carry equal marks.

Q1) (a) What are the differences between informed search and uninformed search? Discuss any two methods for each type of search.

(b) Solve the following blocks world problem using best first search methods. Define the global heuristic function used:

```
                          A
       B                  B
       A                  C
   D   C                  D
```
Start state   Goal state
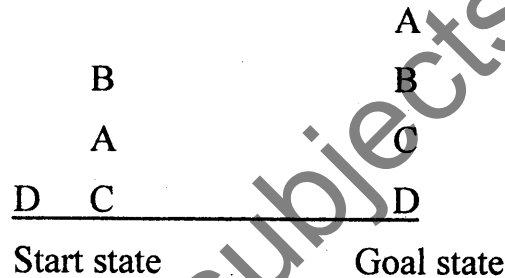
Q2) (a) Explain all weak and strong slot and filler structures used in Artificial intelligence to represent knowledge.

(b) Assume the following facts: Convert the following axioms into clauses and answer the question using resolution: "What food does Ana eat?"

(i) Mary likes all kinds of food.

(ii) Pizza is a food.

(iii) Apple is a food.

(iv) Anything anyone eat is a food.

(v) Ana eats everything Mary eats.

Q3) (a) What are various types of learning? Explain with examples.

(b) What do you understand by genetic algorithms? Explain various operations which can be performed in genetic algorithms.

Q4) (a) Define the state space for water jug problem, traveling salesman problem and 8 - puzzle problem. Arc their universe predictable? Are these problems decomposable and ignorable? Justify your answer.

(b) Solve the crypt arithmetic puzzle: LOGIC + LOGIC = PROLOG.

Q5) (a) What is artificial intelligence? Give examples of any 3 problems solved in artificial intelligence.

(b) What are intelligent agents? Explain their importance.

Q6) Write a note on Fuzzy logic. How do it uses probabilistic reasoning? Define a fuzzy set to define an old person.

Q7) Write a note on planning and acting in real world. Explain important steps in planning with an example.

Q8) Write note on the following:

(a) Perception in AI.

(b) Probabilistic reasoning.

(c) Reinforcement learning in AI.

(d) Adversarial search.

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