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Total No. of Pages : 02

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M.Tech.(CSE Engg.) (E-I) (Sem.-2)

**ARTIFICIAL INTELLIGENCE**

Subject Code : CS-510

M.Code : 35411

Time : 3 Hrs.

Max. Marks : 100

**INSTRUCTION TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1.
  - a. What is Artificial Intelligence? Explain along with any two applications.
  - b. What is the difference between a performance measure and a utility function? Explain.
2.
  - a. Explain why problem formulation must follow goal formulation.
  - b. Describe a search space in which iterative deepening search performs much worse than depth-first search.
3. The travelling salesperson problem (TSP) can be solved using the minimum spanning tree (MST) heuristic, which is used to estimate the cost of completing a tour, given that a partial tour has already been constructed. The MST cost of a set of cities is the smallest sum of the link costs of any tree that connects all the cities.
  - a. Show how this heuristic can be derived using a relaxed version of the TSP?
  - b. Show that the MST heuristic dominates straight-line distance.
4.
  - a. Some agents make inferences as soon as they are told a new sentence, while others wait until they are asked before they do any inferencing. What difference does this make at the knowledge level, the logical level, and the implementation level?
  - b. Represent the following sentences in first-order logic, using a consistent vocabulary (which you must define):
    - i. Not all students take both History and Biology.
    - ii. Only one student failed in History.
    - iii. Only one student failed in both History and Biology.
    - iv. The best score in History was better than the best score in Biology.
    - v. Every person who dislikes all vegetarians is smart.

5. Write down logical representations for the following sentences, suitable for use with Generalized Modus Ponens:
  - a. Horses, cows and pigs are mammals.
  - b. An offspring of a horse is a horse.
  - c. Bluebeard is a horse.
  - d. Bluebeard is Charlie's parent.
  - e. Offspring and parent are inverse relations.
  - f. Every mammal has a parent
6. What are the various types of learning? Explain with examples.
7. Write a short note on planning and acting in real world. Explain important steps in planning with an example.
8. Write note on the following :
  - a. Perception in AI
  - b. Probabilistic reasoning
  - c. Probabilistic language processing
  - d. Communication

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**