

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (AI & DS / DS) (Sem.-5)

**ARTIFICIAL INTELLIGENCE**

Subject Code : BTAIML502-20

M.Code : 93940

Date of Examination : 29-11-2025

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- a) Describe the Turing Test.
- b) Define narrow artificial intelligence and general artificial intelligence.
- c) Discuss the structure of intelligent agents.
- d) Give the PAGE (Percepts, Actions, Goals, Environment) description of a part-picking robot.
- e) What is stochastic search? Explain the working of simulated annealing.
- f) Explain the principles of Bayesian reasoning and derive Bayes' Theorem.
- g) What is non-monotonic reasoning?
- h) Describe Winston's Learning Program.
- i) Why is explanation an important feature of expert systems?
- j) How does supervised learning differ from unsupervised learning?

## SECTION - B

2. What are uninformed search strategies? Explain breadth-first search and depth-first search algorithms in detail. Compare their effectiveness in terms of efficiency and optimality.
3. Differentiate between Propositional Logic and First-Order Logic in terms of expressive power. Explain with examples how each is used for knowledge representation?
4. What does it mean to represent knowledge in an uncertain domain? Explain how probabilistic models are used to represent incomplete or noisy information?
5. Discuss the approaches of Rote Learning and Learning by Taking Advice. How do they differ in terms of knowledge acquisition and application? Provide suitable examples.
6. What are Expert Systems in Artificial Intelligence? Explain how domain knowledge is represented and used in expert systems?

## SECTION - C

7. Write a detailed note on different types of intelligent agents. Discuss their working with the help of schematic diagrams. Explain the characteristics of different types of environments with the help of suitable examples.
8. Describe the implementation of the A\* search algorithm. Explain the role of admissible heuristics and consistency in ensuring optimal solutions.
9. What are Bayesian Networks? Explain their structure, components, and how they represent conditional dependencies. Illustrate with an example showing probabilistic inference in a Bayesian network.

**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.**