

Reg. No.....

Name .....

**M. Sc. DEGREE END SEMESTER EXAMINATION – APRIL 2025****SEMESTER 2 : COMPUTER SCIENCE (ARTIFICIAL INTELLIGENCE)****COURSE: 24P2CAIT07- AI AND KNOWLEDGE REPRESENTATION***(For Regular 2024 Admission)*

Time: Three Hours

Max. Weightage: 30

**PART A****Answer any 8 Questions**

1. Explain the difference between weak AI and strong AI. (U, CO1)
2. Describe the role of intelligent agents in AI. (U, CO1)
3. Explain the impact of Big Data on AI (U, CO1)
4. Describe how heuristic search improves problem-solving efficiency. (U, CO2)
5. Define problem-solving in AI (U, CO1)
6. Why is multi-agent planning more complex than single-agent planning? (A, CO4)
7. How is probabilistic reasoning applied in AI systems? (A, CO3)
8. Define First-Order Logic (FOL). (U, CO3)
9. Define state-space search in AI planning? (U, CO4)
10. Define ontology in knowledge representation. (U, CO5)

**(1 x 8 = 8)****PART B****Answer any 6 Questions****Weights : 2**

11. Explain the nature of AI environments with an example. (U, CO1)
12. Differentiate between blind search and heuristic search strategies. (U, CO2)
13. Solve a given problem using Breadth-First Search (BFS). (A, CO2)
14. Explain the significance of First-Order Logic in knowledge representation with an example. (U, CO3, CO4)
15. Discuss the advantages of A\* search over greedy search. (An, CO2)
16. List and define any two informed search techniques with suitable examples (U, CO2)
17. Explain the working of Greedy Best First Search algorithm with an example. How does it ensure finding the optimal path? (U, CO2)
18. Explain the working of the Depth First Search and Breadth First Search with Suitable examples. Show how it selects nodes step by step in a given search space. (A, CO2)

**(2 x 6 = 12)****PART C****Answer any 2 Questions****Weights: 5**

19. Define Ontology. Explain the key concepts and role of Ontology in Knowledge representation. AI- powered university Chatbots recommend courses based on student interests. (A, CO5, CO6)
20. Explain the types of AI systems with suitable examples. (U, CO1)

21. Explain the role of various graph databases (e.g., AllegroGraph, HyperGraph, Pregel, Trinity, Tao, FlockDB) in Knowledge Representation (KR) with examples of their real- world applications. (A,CO5)
22. Discuss in detail the different types of reasoning used in AI, including deductive, inductive, and abductive reasoning. Explain their significance in knowledge-based systems with suitable real-world examples. (A,CO3)

**(5 x 2 = 10)****OBE: Questions to Course Outcome Mapping**

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.	U	1,2,3,5,11,20	11
CO 2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.	A	4,12,13,15,16	9
CO 3	Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.	U	7,8,14,22	9
CO 4	Demonstrate proficiency developing applications in an AI language. Expert system shell, or data mining tool.	A	6,9,14	4
CO5	Demonstrate proficiency in applying scientific method to models of machine learning.	A	10,19,21	8
CO6	Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.	E	19	5

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMB