



MCA DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2020)

Third Semester

MASTER OF COMPUTER APPLICATIONS

P20CAT3004: Artificial Intelligence

COURSE OUTCOMES

CO1: Know the basics and problem-solving approach to AI problems

CO2: Analyze various search strategies for a problem

CO3: Evaluate different knowledge representation schemes for typical AI problems.

CO4: Design and implement a typical AI problem to be solved Using Machine Learning Techniques

CO5: Design and implement a futuristic AI application

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

- | | | |
|---|-----|-------------------|
| 1. Define Artificial Intelligence | CO1 | [K ₁] |
| 2. List down any two characteristics of intelligent agent. | CO1 | [K ₂] |
| 3. What is Local Maxima? | CO2 | [K ₁] |
| 4. “Computers cannot be intelligent, they can do only what their programmers tell them
“– Justify. | CO2 | [K ₃] |
| 5. Compare uniformed search with informed search. | CO2 | [K ₂] |
| 6. What is First Order Logic (FOL)? | CO3 | [K ₂] |
| 7. Difference between Logic programming and PROLOG. | CO3 | [K ₁] |
| 8. What is the Need for Machine Learning? | CO4 | [K ₂] |
| 9. Define Reinforcement Learning. | CO4 | [K ₂] |
| 10. How does AI help in decision making in healthcare? | CO5 | [K ₃] |

PART B (6 x 5 = 30 Marks)

- | | | |
|--|-----|-------------------|
| 11. Define rationality and explain by using real-time scenario. | CO1 | [K ₃] |
| 12. Discuss the Hill Climbing algorithm in the context of optimization problems. | CO2 | [K ₂] |

Provide a detailed explanation of its working mechanism, strengths, weaknesses, and an illustrative example.

13. Analyze Best-First Search (BFS) algorithm .Elaborate the working mechanism of BFS, the key criteria for selecting the "best" node, and an illustrative example to demonstrate the algorithm's application. CO2 [K₃]
14. Consider the following sentences and covert it to predicate logic using quantifier. CO3 [K₄]
- a) All dogs bark.
 - b) Some birds can fly
 - c) Every student likes at least one subject
 - d) No humans can live forever
 - e) Most computers have internet access.
15. Compare Supervised machine learning algorithm with Unsupervised learning algorithm with examples. CO4 [K₃]
16. Analyze Bayesian Network in depth with a suitable example. CO4 [K₃]

Answer any FIVE Questions

PART C (5 x 10 = 50 Marks)

17. What are the four basic types of agent program in any of the intelligent system? Explain them with a neat diagram. CO1 [K₂]
18. For each of the following activities, give a PEAS (Performance, Environment, Actuators and Sensors) description of the task environment and characterize it in terms of the properties. CO2 [K₃]
- a) Automated Coffee Maker
 - b) Autonomous Vacuum Cleaner
 - c) Chess-Playing AI
 - d) Weather Prediction System
 - e) Automated Stock Trading System
19. Define constraint satisfaction problem (CSP). How CSP is formulated as a search problem? Explain with an example . CO3 [K₃]
20. Explore the basics of Prolog programming and its applications in artificial CO4 [K₃]

intelligence. Provide a detailed discussion on the aspects of prolog basics, working with predicates and queries, applications and limitations, supporting your answers with relevant examples and explanations.

21. Examine the fundamental principles and applications of Support Vector Machines (SVM) in the context of machine learning. Explain SVM algorithm in detail with relevant examples. CO4 [K₄]

22. Analyze how artificial intelligence (AI) technologies have been integrated into industries. Highlighting the impact on efficiency, decision-making, and overall advancement of AI. CO5 [K₅]
