

Reg.No.:



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 60005

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025

Fifth Semester

Information Technology

U23IT512 – ARTIFICIAL INTELLIGENCE

(Common to Computer Science and Engineering)

(Regulation 2023)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

| | | | |
|--------------------------|--------------------|----------------|-----------------|
| Knowledge Levels (KL) | K1 – Remembering | K3 – Applying | K5 - Evaluating |
| | K2 – Understanding | K4 – Analyzing | K6 - Creating |

PART – A

(10 x 2 = 20 Marks)

| Q.No. | Questions | Marks | KL | CO |
|-------|---|-------|----|-----|
| 1. | List any two characteristics of an intelligent agent. | 2 | K1 | CO1 |
| 2. | Differentiate between human intelligence and artificial intelligence. | 2 | K2 | CO1 |
| 3. | Describe the role of heuristics in informed search strategies. | 2 | K2 | CO2 |
| 4. | Identify any two situations where CSP techniques are applied. | 2 | K1 | CO2 |
| 5. | Define unification in the context of logic programming. | 2 | K1 | CO3 |
| 6. | Justify why predicate logic is more powerful than propositional logic. | 2 | K2 | CO3 |
| 7. | Define an intelligent agent. | 2 | K1 | CO4 |
| 8. | Give a real-world example of how a software agent might use trust to make a decision. | 2 | K2 | CO4 |
| 9. | Give an example of how a search engine applies information retrieval. | 2 | K2 | CO5 |
| 10. | Suggest one possible AI application that combines speech recognition and machine translation. | 2 | K2 | CO5 |

PART – B

(5 x 13 = 65 Marks)

| Q.No. | Questions | Marks | KL | CO |
|-----------|--|-------|----|-----|
| 11. a) | Compare problem-solving in AI with traditional programming approaches. Justify the need for intelligent agents in solving real-world AI problems. | 13 | K2 | CO1 |
| | (OR) | | | |
| b) | Discuss different types of intelligent agents with suitable examples. Evaluate the role of AI in shaping the future of education, healthcare, and transportation. | 13 | K2 | CO1 |
| 12. a) | Design a heuristic function for solving the 8-puzzle problem and explain its admissibility. | 13 | K2 | CO2 |
| | (OR) | | | |
| b) i. | Show how alpha-beta pruning reduces the search tree expansion in a simple Min-Max game tree. | 5 | K2 | CO2 |
| ii. | Solve the below crypt-arithmetic while considering the standard rule of crypt-arithmetic. | 8 | | |
| | SEND + MORE ----- MONEY | | | |
| 13. a) i. | Examine the differences between forward chaining and backward chaining approaches in reasoning systems. | 5 | K3 | CO3 |
| ii. | Encode the following in predicate logic and prove the conclusion using resolution refutation: | 8 | | |
| | a. All dogs bark at strangers. | | | |
| | b. Anyone who owns a cat does not own a dog. | | | |
| | c. Light sleepers cannot have anything that makes noise at night. | | | |
| | d. John owns either a cat or a dog. | | | |
| | Therefore, if John is a light sleeper, he does not own a dog. | | | |
| | (OR) | | | |
| b) | Discuss the drawbacks of using predicate logic as a knowledge representation method. Illustrate with use cases. | 13 | K2 | CO3 |
| 14. a) | Examine how trust and reputation mechanisms influence decision-making in large-scale multi-agent environments such as e-commerce or peer-to-peer systems. | 13 | K3 | CO4 |
| | (OR) | | | |
| b) | Construct an agent framework for a self-driving taxi that perceives its surroundings, plans its actions, negotiates with other agents, and executes tasks in a smart city. | 13 | K3 | CO4 |

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|-----|---|----|----|-----|
| 15. | a) Define Natural Language Processing (NLP) and explain its key components with suitable examples. | 13 | K1 | CO5 |
| | (OR) | | | |
| | b) Analyze the role of language models in shaping the intelligence and adaptability of modern chatbots and conversational AI systems. | 13 | K3 | CO5 |

PART – C

(1 x 15 = 15 Marks)

| Q.No. | Questions | Marks | KL | CO |
|-------|---|-------|----|-----|
| 16. | a) 8-Queens Problem requires placing 8 queens on a chessboard such that none attack each other. Apply a local search algorithm (Hill-Climbing / Simulated Annealing) to this problem. Demonstrate the steps and discuss how heuristics guide the solution. | 15 | K2 | CO2 |
| | (OR) | | | |
| | b) Consider a medical expert system where facts such as “If a patient has fever and cough, then they may have flu” are encoded. Explain how forward chaining and backward chaining can be applied to this case. Compare which strategy is more efficient. | 15 | K2 | CO3 |