

Code: 20IT2702A

IV B.Tech - I Semester – Regular Examinations - DECEMBER 2023

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE
(Common for ALL BRANCHES)

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

| | | BL | CO | Max. Marks |
|----------------|---|----|-----|------------|
| UNIT-I | | | | |
| 1 | What are the key criteria for measuring the success of AI systems in solving complex problems? Explain how these criteria apply to different AI techniques and production systems. | L2 | CO1 | 14 M |
| OR | | | | |
| 2 | Explore the characteristics of both problems and production systems in the context of AI. How do the characteristics of a problem influence the choice of AI techniques and search algorithms related to water jug problem? | L2 | CO1 | 14 M |
| UNIT-II | | | | |
| 3 | Explain how A* combines heuristics and cost functions to make informed decisions during search. Provide examples to demonstrate the effectiveness of A* in finding optimal solutions. | L2 | CO2 | 14 M |

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|-----------------|---|----|-----|------|
| OR | | | | |
| 4 | Explain the key components of a Constraint Satisfaction Problem (CSP), such as variables, domains, and constraints, and discuss how algorithms like backtracking and forward checking can be applied to solve CSPs. | L2 | CO2 | 14 M |
| UNIT-III | | | | |
| 5 | Compare and contrast procedural knowledge and declarative knowledge in the context of knowledge representation. Provide real-world examples to illustrate the distinction. | L2 | CO3 | 14 M |
| OR | | | | |
| 6 | How do representations and mappings impact the efficiency and effectiveness of knowledge-based systems? Discuss the challenges associated with selecting appropriate representations and mappings for specific AI applications. | L2 | CO3 | 14 M |
| UNIT-IV | | | | |
| 7 | Provide a comprehensive rationale for employing truth maintenance systems within the context of a depth-first search algorithm. | L3 | CO4 | 14 M |
| OR | | | | |
| 8 | Describe the concepts of weak, strong slot and filler structures in the context of semantic nets. | L3 | CO4 | 14 M |

UNIT-V

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|-----------|--|----|-----|------|
| 9 | Define the concept of an "Expert System Shell" and elaborate on how it facilitates the development of a fresh expert system tailored to a specific problem by harnessing domain-specific knowledge. Support your explanation with a practical example. | L3 | CO5 | 14 M |
| OR | | | | |
| 10 | Discuss the complexities and potential pitfalls of goal stack planning in AI. How does goal stack planning handle issues such as goal ordering and goal interaction? | L3 | CO5 | 14 M |