

Faculty of Engineering

End Semester Examination May 2025

IT3CO30 Artificial Intelligence

Programme	:	B.Tech.	Branch/Specialisation	:	IT
Duration	:	3 hours	Maximum Marks	:	60

Note: All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary.
 Notations and symbols have their usual meaning.

Section 1 (Answer all question(s))

Marks CO BL
 1 1 1

Q1. Which of the following best defines artificial intelligence?

Rubric	Marks
d) All of the above	1

- Making computers intelligent like humans
- Programming computers to solve problems
- Developing software that mimics human behavior
- All of the above

Q2. Which of the following search techniques explores all nodes at the present depth level before moving to the next depth level? 1 1 1

Rubric	Marks
b) Breadth First Search	1

- Depth first search
- Breadth first search
- Best first search
- A* Algorithm

Q3. Hill-climbing search algorithm is best suited for which type of problems? 1 2 2

- Optimization problems
- Path finding problems
- Sorting problems
- Constraint satisfaction problems

Q4. Which of the following is not a type of control strategy in AI? 1 2 2

Rubric	Marks
d) Random control	1

- Heuristic control
- Data-driven control
- Knowledge-driven control
- Random control

Q5. Resolution and refutation are used in AI for- 1 3 3

Rubric	Marks
d) Pattern Matching	1

- Knowledge representation
- Problem solving
- Theorem proving
- Pattern matching

Q6. In first-order predicate logic, which of the following represents a universal quantifier?

1 3 4

Rubric	Marks
b) \forall (For all)	1

- \exists (Exists)
 \Rightarrow (Implies)
- \forall (For all)
 \wedge (And)

Q7. What does Bayes' theorem help in AI?

1 4 2

Rubric	Marks
b) Probabilistic Reasoning	1

- Searching
 Constraint satisfaction
- Probabilistic reasoning
 Game playing

Q8. Which of the following is an example of forward reasoning?

1 4 4

Rubric	Marks
d) Diagnosing a disease based on symptoms	1

- Expert systems drawing conclusions from evidence
 Learning from past experiences
- Chess game deciding the next move
 Diagnosing a disease based on symptoms

Q9. The block world problem in robotics involves which key AI concept?

1 5 5

Rubric	Marks
d) All of the above	1

- Knowledge representation
 Decision trees
- Path finding algorithms
 All of the above

Q10. Alpha-beta pruning is used to optimize which of the following?

1 5 4

Rubric	Marks
d) Best First Search	1

- Hill climbing
 Minimax algorithm
- A* algorithm
 Best first search

Section 2 (Answer all question(s))

Q11. Explain the concept of artificial intelligence using one real-world application.

Rubric	Marks
Explain the concept of Artificial Intelligence, example	2

Marks CO BL
2 1 2

Q12. Compare and contrast Breadth-First Search (BFS) and Depth-First Search (DFS).

3 1 2

Rubric	Marks
BFS, DFS	3

Q13. (a) Discuss the characteristics of production systems and their significance in AI.

5 2 2

Rubric	Marks
Discuss the characteristics of Production Systems, Production system significance in AI.	5

(OR)

- (b)** Explain types of production systems with examples. Discuss its advantages and disadvantages.

Rubric	Marks
Explain types of production system with example, Discuss its advantages and disadvantages	5

Section 3 (Answer all question(s))

Q14. Describe the working of the hill-climbing algorithm and its limitations.

Marks CO BL
2 2 2

Rubric	Marks
Describe the working of the Hill Climbing algorithm, Describe its limitations.	2

Q15. What is simulated annealing? How does it help in optimization problems?

3 2 1

Rubric	Marks
What is Simulated Annealing? How does it help in optimization problems?	3

Q16. (a) Discuss various types of control strategies used in AI search techniques.

5 2 1

Rubric	Marks
Discuss various types of control strategies used in AI search techniques. each one marks	5

(OR)

- (b)** Explain the A* Algorithm with an example. What are its advantages over other search techniques?

Rubric	Marks
Explain the A* Algorithm with an example. What are its advantages over other search techniques?	5

Section 4 (Answer all question(s))

Q17. Explain different types of knowledge representation techniques with examples.

Marks CO BL
4 3 3

Rubric	Marks
each techniques with examples one marks	4

Q18.(a) Prove the goal, “Tom eats deer” with the help of resolution-refutation proofs, consider following statements given in knowledge base.

6 3 3

- Tiger likes deer
- Tiger eats everything they like
- Tom is a Tiger

Rubric	Marks
Complete proof.	6

(OR)

(b) What is the concept of frames and semantic networks? How are they used in AI?

Rubric	Marks
What is the concept of Frames and Semantic Networks? How are they used in AI?	6

Section 5 (Answer any 2 question(s))

Marks CO BL

Q19. Explain monotonic and non-monotonic reasoning with real-life applications.

5 4 2

Rubric	Marks
Explain Monotonic Reasoning with real-life applications. Explain Non-monotonic Reasoning with real-life applications.	5

Q20. What is Bayes' theorem? Explain its application in AI for probabilistic reasoning.

5 4 3

Rubric	Marks
What is Bayes' Theorem? Explain its application in AI for probabilistic reasoning.	5

Q21. Discuss the working of decision trees and their role in classification problems.

5 4 3

Rubric	Marks
Discuss the working of Decision Trees their role in classification problems.	5

Section 6 (Answer any 2 question(s))

Marks CO BL

Q22. Explain the minimax algorithm with an example of a two-player game.

5 5 4

Rubric	Marks
complete algorithm with example	5

Q23. What is alpha-beta pruning? How does it improve the efficiency of the minimax algorithm?

5 5 1

Rubric	Marks
What is Alpha-Beta Pruning? How does it improve the efficiency of the Minimax Algorithm?	5

Q24. Discuss the application of AI in game playing. Provide examples of famous AI-based games.

5 5 1

Rubric	Marks
Discuss the application of AI in Game Playing. Provide examples of famous AI-based games.	5
