

III B. Tech I Semester Regular Examinations, Dec/Jan – 2022-23
ARTIFICIAL INTELLIGENCE
(Common to CSE, IT)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks

UNIT-I

1. a) Discuss categorization of intelligent systems. [7M]
b) Explain in detail the applications of Artificial Intelligence. [7M]
(OR)
2. a) Discuss the characteristics of AI problem. [7M]
b) How can a Tic Tac Toe game application is created using AI? [7M]

UNIT-II

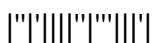
3. a) Solve the water-jug problem by writing the production rules. [7M]
b) Explain various blind search strategies. [7M]
(OR)
4. a) Explain about A* algorithm in detail. [7M]
b) Define constraint satisfaction problem (CSP). How CSP is formulated as a search problem? Explain with an example. [7M]

UNIT-III

5. a) Give the rules of inference in propositional logic and explain natural deduction using an example. [7M]
b) Solve the given propositional calculus expressions are equivalent or not $(P \rightarrow Q \rightarrow R)$ AND $(P \rightarrow Q \wedge Q \rightarrow R)$ [7M]
(OR)
6. a) Define Axiomatic system. State the axioms and the rules used in the Axiomatic system. [7M]
b) What is predicate logic? Explain the predicate logic representation with reference to suitable example. [7M]

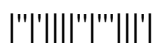
UNIT-IV

7. a) Discuss about Knowledge Representation using Semantic Network. [7M]
b) Represent the following knowledge using a semantic network [7M]
Anil is a writer
Anil lives in Bombay
Swathi is a teacher
Swathi lives in Bangalore.
Anil sent a copy of his book to Swathi
Swathi sent his thanks to Anil.
(OR)
8. a) Explain about Extended semantic networks for KR. [7M]
b) Explain about the rules for conceptual dependencies. [7M]



UNIT-V

9. a) With the help of a neat diagram, explain the Expert System Architecture [7M]
b) What is Inference Engine? Describe Backward and Forward chaining mechanism used by an inference engine? [7M]
(OR)
10. a) How is an expert system different from a traditional program? [7M]
b) List the characteristics of expert systems. Classify various Expert System shells and tools. [7M]



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UNIT-I

1. a) What is AI? Explain any four approaches to AI. [7M]
 b) Explain the techniques of A.I. Also describe the characteristics of Artificial Intelligence. [7M]

(OR)

2. a) How can a Tic Tac Toe game application is created using AI? [7M]
 b) List and explain the applications of Artificial Intelligence. [7M]

UNIT-II

3. a) Draw a state space representation of Towers of Hanoi problem. [7M]
 b) Provide a state space for the game of chess. [7M]

(OR)

4. a) Explain about A* algorithm in detail. [7M]
 b) Illustrate the heuristic Hill climbing algorithm with an example. [7M]

UNIT-III

5. a) Show by using truth table the expressions are logical equivalent $[(A \rightarrow B) \rightarrow C, A \rightarrow (B \rightarrow C)]$ and $[(A \wedge \sim B) \rightarrow C, \sim (A \wedge \sim B \wedge \sim C)]$. [7M]
 b) Compare and contrast the two variants of logic-predicate and propositional. [7M]

(OR)

6. a) Illustrate semantic tableau system in propositional logic using the rules? [7M]
 b) What is predicate logic? Explain the predicate logic representation with reference to suitable example. [7M]

UNIT-IV

7. a) Explain Inheritance in Semantic Net. [7M]
 b) Illustrate the Backward Reasoning Inference Method by using some Example. [7M]

(OR)

8. a) Explain different conceptual Primitive Actions. [7M]
 b) What is meant by Script? Write a script for Going to Theater. [7M]

UNIT-V

9. a) What are the prominent features of an expert system and describe their features in detail. [7M]
 b) Explain Architecture of an Expert system. Give its three application areas. [7M]

(OR)

10. a) Describe different type of knowledge required to build an expert system. [7M]
 b) Give an overview of various types of expert system tools and criteria for selecting the right kind of tool. [7M]



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UNIT-I

1. a) Briefly Explain the history of Artificial Intelligence. [7M]
b) What is AI? Explain any four approaches to AI. [7M]
(OR)
2. a) How can a Tic Tac Toe game application is created using AI? [7M]
b) What are current trends in A.I [7M]

UNIT-II

3. a) Solve the water-jug problem by writing the production rules. [7M]
b) Describe different control strategies used in problem solving. [7M]
(OR)
4. a) Explain about A* algorithm in detail. [7M]
b) Define constraint satisfaction problem (CSP). How CSP is formulated as a search problem? Explain with an example. [7M]

UNIT-III

5. a) Explain the forward-chaining algorithm for propositional logic. [7M]
b) Apply resolution refutation in proportional logic for checking the equivalence of expressions. [7M]
(OR)
6. a) Define Axiomatic system. State the axioms and the rules used in the Axiomatic system. [7M]
b) Prove the following theorem using deductive inference rules [7M]
From $A \rightarrow B \wedge C$, A infer C , from $A \wedge B$, $A \rightarrow C$ infer C .

UNIT-IV

7. a) Explain Inheritance Rules in Prolog. [7M]
b) Illustrate the Forward Reasoning Inference Method by using some Example. [7M]
(OR)
8. a) Explain the rules for Conceptualization Blocks in CD. [7M]
b) What is meant by Script? Write a script for Restaurant Problem. [7M]

UNIT-V

9. a) Explain the phases in building expert system. [7M]
b) Discuss the expert system in domain of medicine using suitable case study? Explain its architecture describing its components. [7M]
(OR)
10. a) Give two examples of non-monotonic system. Consider some monotonic and non monotonic applications and show how you can solve them using truth monotonic system. [7M]
b) Build a rule based expert system for criminal identification. [7M]



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UNIT-I

1. a) Define Artificial Intelligence. Explain the techniques of A.I [7M]
b) Discuss categorization of intelligent systems. [7M]
(OR)
2. a) How can a Tic Tac Toe game application is created using AI? [7M]
b) List and explain the applications of Artificial Intelligence. [7M]

UNIT-II

3. a) Draw a state space representation of Towers of Hanoi problem. [7M]
b) Describe the factors determining the choice of direction of a particular problem. [7M]
(OR)
4. a) Explain the Heuristic Search Techniques. [7M]
b) Explain about A* algorithm in detail. [7M]

UNIT-III

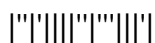
5. a) Give the rules of inference in propositional logic and explain natural deduction using an example. [7M]
b) Explain the syntax and semantics of propositional logic. [7M]
(OR)
6. a) Show by using truth table the expressions are logical equivalent $[(A \rightarrow B) \rightarrow C, A \rightarrow (B \rightarrow C)]$ and $[(A \wedge \sim B) \rightarrow C, \sim (A \wedge \sim B \wedge \sim C)]$. [7M]
b) Illustrate semantic tableau system in propositional logic using the rules? [7M]

UNIT-IV

7. a) Give an overview of various knowledge representation approaches. [7M]
b) Represent the following knowledge using a semantic network [7M]
Tom is a Cat
Tom caught a bird
Tom is owned by John
Tom is ginger in colour
Cats like cream
Cat is on the mat
A Cat is a Mammal
A Bird is an animal
All mammals are animals
Mammals have fur

(OR)

8. a) Explain Conceptual Parsing briefly. [7M]
b) What is meant by Script? Write a script for Going to Theater. [7M]



UNIT-V

9. a) Briefly explain the architecture of expert systems. [7M]
b) Explain the Applications of the Expert systems. [7M]
(OR)
10. a) Explain about MYCIN Expert system in detail. [7M]
b) Explain the Issues in black board systems for problem solving. [7M]