

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Bachelor of Technology (Computer Engineering) SEMESTER - 7 Summer 2025 (Supply.)

Course :Bachelor of Technology (Computer Engineering) Branch : Engineering and Technology

Semester : SEMESTER - 7

Subject Code & Name: BTCOC701 - ARTIFICIAL INTELLIGENCE

Time : 3 Hours]

[Total Marks : 60

Instructions to the Students:

1. Each question carries 12 marks.
 2. Question No. 1 will be compulsory and include objective-type questions.
 3. Candidates are required to attempt any four questions from Question No. 2 to Question No.6
 4. Use of non-programmable scientific calculators is allowed.
 5. Assume suitable data wherever necessary and mention it clearly.
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Q1. Objective type questions. (Compulsory Question)

12

- 1 Which factor most fundamentally limits the performance of rational agents?**
 - a) Infinite computational resources
 - b) Deterministic environments
 - c) Perfect sensory inputs
 - d) Reactive architectures
- 2 Rationality of an agent depends on:**
 - a) Human-like behavior
 - b) Past environment states only
 - c) Performance measure, percept sequence, agent's knowledge, and actions
 - d) Internal emotions and subjective reasoning
- 3 A heuristic function $h(n)$ is admissible if:**
 - a) $h(n) = 0$ for all n
 - b) $h(n)$ overestimates the true cost
 - c) $h(n)$ never overestimates the actual cost to reach the goal
 - d) $h(n)$ is always equal to $g(n)$
- 4 Alpha-Beta pruning is primarily used in:**
 - a) Constraint Satisfaction Problems
 - b) Local Search optimization
 - c) Game-playing adversarial search
 - d) Uninformed search strategies
- 5 What is a key advantage of using predicate logic over propositional logic?**
 - a) Faster resolution
 - b) Ability to express relationships between objects
 - c) Simpler truth table representation
 - d) Requires less computation
- 6 In knowledge representation, procedural knowledge is typically harder to:**
 - a) Represent
 - b) Store
 - c) Explain
 - d) Execute

- 7 **Bayesian networks model uncertainty through:**
 a) Conditional probability distributions
 b) Fuzzy membership functions
 c) Logic predicates
 d) State-space representation
- 8 **Semantic analysis in NLP focuses on:**
 a) Sentence boundary detection
 b) Parsing sentence structure
 c) Extracting meaning from text
 d) Managing discourse relations
- 9 **Which form of machine learning typically involves learning from a set of pre-classified examples?**
 a) Reinforcement Learning
 b) Unsupervised Learning
 c) Inductive Learning
 d) Genetic Algorithms
- 10 **Expert systems differ from standard AI systems mainly because they:**
 a) Focus solely on probabilistic reasoning
 b) Use case-based reasoning exclusively
 c) Capture human domain knowledge in rule-based structures
 d) Do not require inference engines
- 11 **A neural network's weights are best described as:**
 a) Random variables representing uncertainty
 b) Adjustable parameters that encode learned knowledge
 c) Logical operators
 d) Static control knowledge
- 12 **Which local search strategy is most susceptible to getting stuck in local optima?**
 a) Hill Climbing
 b) Simulated Annealing
 c) Genetic Algorithms
 d) Tabu Search

- Q2. Solve the following.
- | | |
|--|---|
| A) Discuss the historical evaluation of Artificial Intelligence. | 6 |
| B) State the relationship between agent and environment. | 6 |
- Q3. Solve the following.
- | | |
|--|---|
| A) Give the outline of uniform cost search algorithm. | 6 |
| B) What is alpha-beta pruning? Explain the function of alpha-beta pruning. | 6 |
- Q4. Solve Any Two of the following.
- | | |
|---|---|
| A) What is planning? What is need of planning. | 6 |
| B) Give outline of simple forward Chaining algorithm with suitable example. | 6 |
| C) Explain the production based knowledge representation technique. | 6 |
- Q5. Solve Any Two of the following.
- | | |
|--|---|
| A) Explain Bayesian Network. | 6 |
| B) Compare and contrast the following:
Forward Vs. Backward Reasoning | 6 |

- C) What is fuzzy set? Explain degree of membership. How does are represent a fuzzy set in a computer. 6

Q6. Solve Any Two of the following.

- A) Comparison between Syntactic Processing & Semantic Processing. 6
B) What is Expert system? Explain its Architecture, Features & applications. 6
C) What is Natural Language Processing? Explain various types of NLP techniques. 6

*** End ***