

Unit wise Question Bank

Program : TYBSc.I.T. Semester – V Course : Artificial Intelligence

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Unit-1

- 1 What is Artificial Intelligence?
- 2 What is Turing Test Approach? What is rational agent approach?
- 3 Explain foundation of A.I. w.r.t. following areas:
 1. Philosophy
 2. Mathematics
 3. Economics
 4. Neuroscience
 5. Psychology
 6. Computer Engineering
 7. Control Theory and cybernetics
 8. Linguistics
- 4 Explain state of Art of AI with examples.
- 5 Explain agent and its types with reference to Artificial Intelligence.
- 6 Explain what is meant by following.
 1. Percept Sequence
 2. Rationality
- 7 Explain agent program of Vacuum Cleaner with diagram
- 8 Explain environment and its types.
- 9 What is meant by PEAS? Explain it with different kind of agent / agent program.
- 10 Explain the difference between following types of environments.
 1. Fully observable vs. partially observable
 2. Single agent vs. Multi agent
 3. COMPETITIVE vs. COOPERATIVE MULTI AGENT
 4. DETERMINISTIC vs. STOCHASTIC
 5. Episodic vs. Sequential
 6. Static vs. Dynamic
 7. Discrete vs. Continuous
 8. Known vs. Unknown
- 11 Explain task environments and their characteristics for following:
 1. Chess
 2. Crossword Puzzle
 3. POKER
 4. Backgammon
 5. Taxi driving
 6. Medical diagnosis
 7. Image analysis
 8. Part picking robot
 9. Refinery Controller
 10. Interactive English Tutor
- 12 Explain structure of agents, agent program algorithm.
- 13 Explain in detail different KINDS OF AGENT PROGRAMS
- 14 Explain the difference between following:
 1. Simple reflex agents vs. Model-based reflex agents
 2. Goal-based agents vs. Utility-based agents.

Unit – 2

- 1 Explain Goal and problem formulation.
- 2 Explain Search, Solution and Execution w.r.t. AI.
- 3 Explain following terms:
 1. State space of problem
 2. Path in state space
 3. Goal test
 4. Path cost
 5. Solution to problem
- 4 Explain 8-puzzle game problem.
- 5 Explain real world problem.
- 6 Explain Infrastructure for search algorithms.
- 7 Explain how algorithm's performance can be evaluated?
- 8 What is meant by Uninformed Search and Uniform-cost search Explain in detail.
- 9 Explain different components of problem.
- 10 Explain BFS and DFS algorithm w.r.t. AI
- 11 What is meant by complexities? Explain it w.r.t. following algorithms.
 1. BFS
 2. DFS
 3. Bidirectional
 4. Uniform Cost
 5. Interactive Deepning
- 12 Explain Hill Climbing search algorithm.
- 13 what is meant by Informed (Heuristic) Search Strategies.
- 14 Explain travelling Salesmen algorithm.
- 15 Compare different types of uninformed search strategies.
- 16 Write a short note on A* Search.
- 17 Explain local search algorithm
- 18 Explain greedy local search algorithm
- 19 Explain 8-Queens state algorithm.
- 20 Explain Stochastic hill climbing search algorithm.
- 21 Explain searching with following.
 1. Searching with nondeterministic actions
 2. Searching with no observation
 3. Searching with partial observations
- 22 What is meant by Contingency Plan? Explain
- 23 What is meant by genetic algorithm? Explain
- 24 What is meant by belief state? Explain Prediction stage of vacuum world.
- 25 Explain working of problem-solving agent for partially observable environments
- 26 What is meant by online search agents and unknown environment? Explain
- 27 Write an algorithm for online DFS agent searching.

Unit-3

- 1 Define game formally with important elements.
- 2 Explain how importance of optimal decisions in games in brief
- 3 Explain following w.r.t. optimal decision in games.
 1. Ply
 2. Minimax
- 4 State and explain Minimax algorithm.
- 5 State and explain alpha beta pruning algorithm and Monte Carlo simulation w.r.t. it.

- 6 What is meant by strategy? Explain stochastic strategy and pure strategy.
- 7 Explain contribution of A.I. in algorithm of stochastic game.
- 8 Explain state of the art game programs with various games.
- 9 Write a short note on knowledge-based agent.
- 10 Explain wumpus world game with diagram and agent program of it.
- 11 Write a shortnote on propositional logic.
- 12 Explain Backus-Naur Form grammar of sentences along with operator precedence.
- 13 Explain semantics and atomic sentences w.r.t. A.I.
- 14 Explain how Propositional Logic is used to solve wumpus world problem.
- 15 Write a short note on standard logical equivalences for arbitrary sentences of propositional logic.
- 16 Explain Propositional Theorem Proving for WUMPUS World.
- 17 What is meant by monotonicity? Explain it w.r.t. propositional theorem.
- 18 What is meant by conjunctive normal form? Explain.
- 19 Write resolution algorithm and ground resolution algorithm for propositional logic.
- 20 Explain the difference between horn and definite clauses.
- 21 Explain Forward-chaining And Backwardchaining in brief.
- 22 Write a short note on Backtracking Algorithm / DPLL algorithm.
- 23 What is meant by Satisfiability Problem? Explain tricks used for SAT solver.
- 24 Explain WALKSAT algorithm in detail.
- 25 Explain Landscape Of Random SAT Problems.
- 26 What is meant by Satisfiability Threshold Conjecture? Explain with diagram.
- 27 Explain role of agent and agent's percept for the solution of Wumpus world problem.
- 28 Explain following Terms w.r.t. The Agent's Percept.
 1. Atemporal Variables
 2. Locality
 3. Inferential Frame Problem
 4. Qualification Problem
- 29 What is meant by hybrid agent? Explain.
- 30 Explain Logical State Estimation in detail.
- 31 Write Hybrid Wumpus Agent algorithm with percept.
- 32 Explain how to make plans by logical inference to solve problem.
- 33 State and explain SATPlan Algorithm Translated In CNF.

Unit-4

- 1 What is meant by First Order Logic? Explain syntax and semantics of First Order Logic.
- 2 Explain following w.r.t. First Order Logic.
 1. Term
 2. Atomic Sentences
 3. Complex Sentences
 4. Quantifiers.
 5. Existential quantification
 6. Equality
- 3 Explain Assertions And Queries In First-order Logic.
- 4 Explain Kinship Domain (Family relationship of statement Domain).
- 5 Explain steps of Knowledge Engineering projects in First Order Logic.
- 6 Explain how A.I is useful in Electronic Circuits Domain.
- 7 Explain Inference rules for quantifiers with example.
- 8 Explain Generalized Modus Ponens Rule in detail.
- 9 Explain First-order Inference Rule.
- 10 What is meant by Unification And Lifting? Explain lifted Modus Pones rule in detail.

- 11 Explain Datalog used in first order definite clause.
- 12 Explain Simple Forward-chaining Algorithm in detail with example and advantage.
- 13 Explain Backward chaining and Working of Backward chaining.
- 14 Explain Resolution Theorem and its disadvantages.
- 15 Explain eight-stage process that converts any sentence into CNF.
- 16 Explain Resolution Inference Rule in detail.
- 17 Explain Completeness Of Resolution and basic structure of it.
- 18 Explain following inference methods.
 - 1. Reflexive
 - 2. Symmetric
 - 3. Transitive
- 19 Explain Demodulation and Paramodulation
- 20 Write a short note on Resolution Strategies.

Unit-5

- 1 Explain Planning Domain Definition Language.
- 2 What is meant by classical planning with example.
- 3 Write a short note on PlanSAT & Bounded PlanSAT.
- 4 What is State space search? Explain its properties.
- 5 Write Forward (progression) state-space search algorithm.
- 6 Explain how Forward Search can be made Deterministic.
- 7 Explain problems with Forward Search Deterministic.
- 8 Write Backward Space Search Algorithm and Lifted Backward State-Space Search Algorithm.
- 9 Explain properties of and problems with Backward State-Space Search Algorithm: Explain Heuristics for planning.
- 10 What is graph plan? Explain termination of it.
- 11 Explain Planning As First-order Logical Deduction and Situation Calculus.
- 12 What is meant by Constraint Satisfaction. Explain Planning As Constraint Satisfaction.
- 13 What is meant by Refinement Of Partially Ordered Plans? Explain Planning As Refinement Of Partially Ordered Plans.
- 14 Explain Analysis Of Planning Approaches. What is meant by Serializable Subgoal?
- 15 Explain Temporal And Resource Constraints.
- 16 What is Hierarchical planning and Hierarchical Task Network.
- 17 What is meant by Nondeterministic Domains? Explain Planning adaption for Nondeterministic Domains.
- 18 Explain General Characteristics Of Uncertain Environments.
- 19 Explain Categories of Planning And Acting In Nondeterministic Domains.
- 20 Write a short note on Sensorless planning or conformant planning.
- 21 Write a short note on Conditional planning or Contingency planning:
- 22 Explain Online replanning in detail.
- 23 Explain different Categories of Planning.
- 24 Write a short note on how planning is done with Multiple Simultaneous Actions
- 25 Give demonstration for Algorithm of Multiactor Planning.
- 26 Explain Cooperation And Coordination requirement in planning with Cooperation And Coordination with example.
- 27 Explain Extrinsic & Intrinsic object and categories w.r.t. A. I.
- 28 Write a short note on following:
 - 1. Mental Model and Mental Events.
 - 2. Event and Event calculus
- 29 Explain Characteristics of Mental Model.

- 30 Explain Mental Model demonstration with example.
- 31 Write a short note on following.
1. Reasoning Systems For Categories.
 2. Semantic networks
- 32 Explain Description Logics in detail.
- 33 What is meant by Classical Language.
- 34 Write a short note on Circumscription And Default Logic.
- 35 Explain working of Internet Shopping World.