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DEPARTMENT OF COMPUTER ENGINEERING

Class: T.E (A&B) **Subject: Artificial Intelligence**

Question Bank For Unit I

1) Define AI. Give typical applications of A.I in detail.
2) Write a brief note on foundation and history of AI?
3) List and explain the potential risks and benefits of AI.
4) Detail a case study on state of the art AI.
    a. Robotics
    b. Agriculture
    c. Big data
    d. Medicine
    e. Ecommerce
5) What is an Intelligent agent? List and explain classes of agents.
6) What is the concept of Rationality?
7) What is an agent and its environment in AI? List the different types of environments with example.
8) Define PEAS with a example.

References:

1. Elaine Rich, Kevin Knight and Nair, "Artificial Intelligence", TMH,ISBN-978-0-07-008770-5
2. Stuart Russell and Peter Norvig, "Artifcial Intelligence: A Modern Approach", Third edition, Pearson, 2003, ISBN :10: 0136042597

Question Bank For Unit II

1) Explain in detail about problem solving agent with an example.
2) Define state space search. Explain the following search problems : a)water jug problem b)Missionaries and cannibals c)Toy problem
3) Define Heuristics. Define a heuristic for 8 Sliding Tile puzzle problem and explain the A* algorithm to solve the problem.
4) Explain A* algorithm in detail with example.
5) List the differences between Informed and Uninformed search techniques.
6) Compare Depth First and Best First Search methods.
7) a) Explain A* algorithm with an example.
    b) What are weak search methods?
    c) Explain the following terms: i) Depth limit. ii) Search tree.
8) Explain Depth first search and the concept of Depth First Iterative Deepening.
9) Write a note on i)Beam search ii)Tabu search
10) Explain with an example Best first search and Recursive best first search.
11) Detail the concept of Iterative deepening A* algorithm with an example.
12) Write a note on learning heuristics from experience.

13) Explain admissible heuristic function for A* search.

References:

1. Stuart Russell and Peter Norvig, "Artifcial Intelligence: A Modern Approach", Third edition, Pearson, 2003, ISBN :10: 0136042597
2. Deepak Khemani, "A First Course in Artificial Intelligence", McGraw Hill Education(India), 2013, ISBN : 978-1-25-902998-1
3. Elaine Rich, Kevin Knight and Nair, "Artificial Intelligence", TMH,ISBN-978-0-07-008770-5

Question Bank for unit III

1) Define Game Theory.
2) Explain Alpha-Beta Tree search and cutoff procedure in detail with an example.
3) Explain minmax procedure for game playing with an example.
4) Show the demonstration of tic tac toe problem with minmax search technique.
5) Explain alpha beta pruning with an example.
6) Write a short note on Monte Carlo Tree search and list its limitations.
7) Apply constraint satisfaction method to solve the crypt-arithmetic problem SEND+MORE=MONEY.
   (TWO+TWO=FOUR, CROSS+ROADS=DANGER)
8) Define Constraint satisfaction problem. What are the variations on CSP formalism? Explain?
9) What are the issues that need to be addressed for solving CSP efficiently? Explain the solutions to them.
10) Explain Backtracking search algorithm for CSP with an example.
11) Explain Constraint propagation in detail with an example.
12) Explain ARC consistency algorithm in detail with an example.
13) Detail the concepts of backtracking and constrain propagation and solve the n-queen problem using these algorithms.
14) Explain the concept of Look ahead strategy in CSP.
15) Explain the concept of Scene Labeling. What are higher order and directional consistencies?

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1. Elaine Rich, Kevin Knight and Nair, "Artificial Intelligence", TMH,ISBN-978-0-07-008770-5
2. Stuart Russell and Peter Norvig, "Artifcial Intelligence: A Modern Approach", Third edition, Pearson, 2003, ISBN :10: 0136042597
3. Deepak Khemani, "A First Course in Artificial Intelligence", McGraw Hill Education(India), 2013, ISBN : 978-1-25-902998-1

Question Bank for Unit IV and V

1) What are Logical Agents?
2) List the inference rules used in Propositional Logic? Explain them
3) What is meant by Proof by resolution?
4) Explain CNF with example.

5) Define Horn clause and definite clause with an example.
6) Explain syntax and semantics of First Order Logic.
7) Detail the algorithm for deciding entailment in proposition logic.
8) Explain Unification algorithm with an example.
9) Explain Resolution algorithm with example.
10) Explain the process of resolution with proper example.
11) What are the drawbacks of Predicate logic used in representation of facts? Give five examples where it becomes extremely difficult to use predicate logic for representation.
12) What is logic programming?
13) Write a note on Propositional logic and predicate logic.
14) Explain Forward and backward chaining. What factors justify whether reasoning is to be done in forward or backward chaining?
15) What are the reasoning patterns in Propositional logic? Explain them in detail.
16) Explain the Logical connectivities?
17) Write a note on Deductive Retrieval and Second order Logic.
18) What is skolemization?
19) State generalized modus ponens rule.
20) Define atomic and complex sentences with example.
21) List all the steps in knowledge engineering process.
22) Explain Knowledge representation structures and compare them.
23) Explain the concept of a) Frames B)Conceptual Dependency C) Semantic net
24) Discuss theory of beliefs.
25) Write a note on circumscription
26) What do you mean by ontology of situation calculus?
27) Write a note on categories and objects.

References:

1. Elaine Rich, Kevin Knight and Nair, "Artificial Intelligence", TMH,ISBN-978-0-07-008770-5
2. Stuart Russell and Peter Norvig, "Artifcial Intelligence: A Modern Approach", Third edition, Pearson, 2003, ISBN :10: 0136042597
3. Deepak Khemani, "A First Course in Artificial Intelligence", McGraw Hill Education(India), 2013, ISBN : 978-1-25-902998-1
4. NPTEL and MIT courseware video lectures

Question Bank for Unit VI

1) What is Unified frame work for planning?
2) Explain in detail Goal stack planning and Plan space planning.
3) Explain Forward (Progression) state space search and Backward (Regression) state space search with example.
4) Discuss blocks world problem from planning perspective.
5) What is a partial order planner?
6) Explain the concept of STRIPS planning with an example.
7) What is state space planning? Detail the concept of Forward and backward reasoning.
8) What is Rule based system?
9) Explain the terms for time and schedule from perspective of temporal planning.
10) Analyze various planning approaches.

11) Write a detailed note on AI architecture.
12) List the components of AI.
13) Discuss AI and its ethical concerns.

References:

1. Elaine Rich, Kevin Knight and Nair, “Artificial Intelligence”, TMH,ISBN-978-0-07-008770-5
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3. Deepak Khemani, “A First Course in Artificial Intelligence”, McGraw Hill Education(India), 2013, ISBN : 978-1-25-902998-1
4. NPTEL and MIT courseware video lectures

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