M.Sc. (I.T.) – 8th Semester
Introduction to Artificial Intelligence

QUESTION BANK

DESCRIPTIVE QUESTIONS

Unit – 1 :: *Introduction to AI and Intelligent Agent*

1. What do you mean by AI ? Explain it's component in detail with example.
2. Write a short note on : "History of AI"
3. Explain why we need AI? Explain it's goal, advantage and dis-advantage.
4. What do you mean by PEAS? Explain PEAS representation for following AI applications:
   - Self-driving car
   - Part-Picking Robot
5. Differentiate following environment types
   - Static v/s Dynamic
   - Single Agent v/s Multi Agent
   - Known v/s Unknown
6. What do you mean by AI agent? List different types of AI Agent and explain any one of them.
7. Differentiate Goal based agent v/s Utility based agent.
8. Write short notes on: Model based reflex agent, Learing Agent
9. Differentiate Model based reflex agent v/s Learning Agent.

Unit-2: Search Algorithm and Optimization

10. How to formulate real world problem in to Search Algorithm? Explain with proper example.
11. Explain following terms in context of search algorithm:
    State, Starting State, Goal State, Actions, Solutions, Cost function and State space.
12. What is 'Uninformed Search'? Explain DFS and BFS with proper example.
13. Justify the statement "IDS algorithm is bettern than DFS and BFS" using proper example.
14. Compare various Uninformed Search techniques using properties: Completeness, Time complexity, Space complexity and Optimality.
15. What is heuristic search? Explain A* algorithm with proper example.
16. Explain Hill Climbing algorithm. Also explain it's problems arise in it with solutions.

17. Explain Beam search algorithm. Also explain the special cases in which beam search algorithm can be act as 'Hill Climbing' algorithm or 'Breadth First Search' algorithm.
18. Explain 'Tabu Search' algorithm with its 'Forbinding', 'Freeing' and 'Short-Term' strategies using proper example.
19. Explain Dijkstra algorithm in detail with proper example.
20. What do you mean by CSP? Explain with multiple example.
21. Explain 'Cript-Arithmatic problem' in detail as constraint satisfaction problem using proper example.

Unit-3 : Gaming

22. What is 'Adverserial Search' ? Explain characteristics of 'Zero Sum Game' in detail with proper example.
23. What is Gaming in terms of AI? Explain Two player game characterisitcs in detail with proper example.
24. Explain Min-Max algorithm with proper example. Also explain how 'Alpha-Beta' algorithm can act in better way than that of Min-Max algorithm?
25. Explain alpha-beta algorithm with proper example.
26. Explain 'SSS* algorithm' is superior than 'alpha-beta algorithm' for Gaming.
27. Write a short note on 'SSS* gaming algorithm'.

Unit-4 : Planning

28. In context of AI planning, differentiate FSSP and BSSP.
29. Explain 'Goal Stack Planning' using block world problem with its pre-condition using proper example.
30. What is 'Sussman's Anomaly' ? Explain in detail with its solution.
31. Explain partial order planning with proper example.
32. Explain 'Graph Plan' with proper example.
33. Explain planning as CSP with proper example.

Unit-5 : Knowledge Representation

34. What is Knowledge representation? Explain in detail Knowledge Base agent.
35. Write a short note on: Type of knowledge.
36. Explain Universal Quantifier and Existential Quantifier of FOL with proper example.
37. Write a short note on: Genetic Algorithm.

38. Explain Genetic algorithm terminology: Population, Cromosomes and Gene with proper example. Also explain its operators : Selection, Cross over and Mutation.

39. Explain Fitness Function, Paring and Crossover in context of Genetic algorithm in detail with proper example.

40. Write a short note on: Fuzzy Logic.

41. What is Fuzzy Logic? Also explain advantages, dis-advantages and applications of fuzzy logic.

42. What is expert system? Explain it's characteristics and component in detail.

43. Write a short note on: Expert System Development Life Cycle.

44. Explain RETE algorithm with it's characteristics

45. What is Ontology ? Explain its application 'Semantic Network' with proper example.

46. What is PROLOG? Explain it's elements : Facts, Rules and Queries using proper example.

47. Explain Comparative operator, Arithmatic operator and conditional operator of PROLOG in detail with proper example.