AI Question Bank

1) What is “Artificial Intelligence and Artificial Intelligence Technique”? Briefly explain how AI Technique can be represented and list out some of the task domain of AI.
2) Enumerate Classical “Water jug Problem”. Describe the state space for this problem and also give the solution.
3) What is production system? Explain it with an example. Discuss the Characteristics of a production system.
4) How to define a problem as state space search? Discuss it with the help of an example.
5) Define the following problems. What types of control strategy is used in the following problem.
   I. The Tower of Hanoi
   II. Crypto-arithmetic
   III. The Missionaries and cannibals problems
   IV. 8-puzzle problem
6) Discuss the following search Technique with the help of an example. Also discuss the benefits and shortcoming of each.
   I. Breadth First Search.
   II. Depth First Search.

7) Give an example of a problem for which breadth first search would work better than depth first search.
8) Explain the algorithm for steepest hill climbing.
9) Explain the following search strategies

   i) best first search

   ii) A* search

10) Illustrate the use of predicate logic to represent the knowledge with suitable example.

11) consider the following sentences
   • John likes all kinds of food
   • Apples are food
   • Chicken is food
   • Anything anyone eats and isn’t killed by is food
   • Bill eats peanuts and is still alive • Sue eats everything bill eats
   i) Translate these sentences into formulas in predicate logic
   ii) Prove that john likes peanuts using backward chaining
   iii) Convert the formulas of a part into clause form
   iv) Prove that john likes peanuts using resolution
12) Define the heuristic search. Discuss benefits and short comings.
13) Discuss any four from the following heuristic search techniques. Explain the algorithm with the help of an example.
   i. Hi Climbing : Steepest Ascent.
   ii. Best First Search: The A Algorithms.

iii. Problem Reduction: The Ao Algorithms.
iv. Constraints Satisfaction.
v. Generate and Test.
vi. Means – End – Analysis.

14) Solve the following Crypt arithmetic problem using constraints satisfaction search procedure.

CROSS	NOON
ROADS	SOON
----------	+MOON
DANGER	----------
	JUNE

15) Explain briefly the difference between procedural and declaration knowledge.
16) Discuss various approaches and issues in knowledge representation. Also discuss various Problems in representing knowledge.
17) Explain the algorithm of predicate logic resolution.
18) Write unification algorithm and explain resolution in predicate logic.
19) Explain Non – Monotonic reasoning and discuss. Various logic associated with it.
20) Explain AO* algorithm with an example.
21) Explain unification algorithm used for reasoning under predicate logic With an example.
22) Explain how a constraint satisfaction problem (CSP) may be solved.
23) Explain the resolution procedure in detail.
24) Explain the Unification used for reasoning under predicate logic with Eg.
25) Give the Algorithm for BFS and DFS and explain it in detail.
26) Represent the following statements in predicate logic:
    i) Marcus tried to assassinate Caesar.
    ii) All Pompeian's were Roman.
    iii) All Romans were either loyal to Caesar or hated him.
    iv) Everyone is loyal to someone.
    v) People only try to assassinate rulers they are not loyal to.
27) What is non – monotonic reasoning? Explain the logics used for non – monotonic reasoning.
28) What are scripts? Explain in detail, with an example.
29) Write a short note on
    i) Expert systems ii) Knowledge Acuisition
30) What is AND graph and OR graph? Explain A* algorithm with example.
31) Explain conceptual dependency with an example and build up the conceptual dependency structures for the following sentences:
    i) John pushed the cart.
    ii) John took the book from Mary.
    iii) While going home, I saw a frog.
32) Write AO* algorithm and explain with suitable example.

33) Give the steps involved in converting wff predicates into clause form. Give an example in each step.
34) Write the unification algorithm and explain.
35) Write a short note on
    i) Justification – Based Truth Maintenance Systems
    ii) Logic – Based Truth Maintenance Systems
36) Write the constraint satisfaction procedure. Trace the execution of the constraint satisfaction procedure in solving crypto-arithmetic problem:
37) Discuss the heuristic function. Explain how the heuristic function helps during search procedure. Explain with a suitable example.