ASSIGNMENT-1

Subject/ Subject Code	Semester/ Branch	Issue Date	Due Date
Artificial Intelligence / 01CE0702	7th – C.E(FOT1-MU)	31-08-2023	12-09-2023

1. Write a short note on different task domains of AI.
2. State Water Jug problem. Give its state space representation.
3. What is Hill Climbing? What are the problems in Hill Climbing? Explain Simple Hill Climbing and Steepest scent Hill Climbing?
4. Compare the following:
   i) BFS and DFS
   ii) Informed Search and Uninformed Search
5. Explain the following Terms:
   i) Generate and Test
   ii) AO Graphs
   iii) Brute Force Search
   iv) Problem Reduction
6. What is Constraint Satisfaction Problem? Solve the following Crypt arithmetic Problem.

   B A S E
   + B A L L
   _____
   G A M E S
7. Explain the different types of Knowledge Representation Schemes.
8. Difference between Procedural and declarative Knowledge.
9. Explain the terms: Semantic Net and Frames.
10. Assume the following facts:
    i. "Steve only likes easy courses.
    ii. Science courses are hard.
    iii. All the courses in Humanities Department are easy.
    iv. HM101 is a course in Humanities".

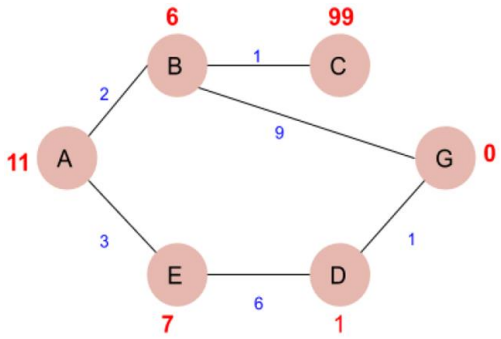
    Convert the above statements into appropriate wffs so that the resolution can be performed to answer the question. "What course would Steve like?"

11. Convert the Following Facts into First Order Predicate Logic:
    i) Marcus was a Pompeian.
    ii) All Pompeians were Romans.
    iii) All Romans were either loyal to Caesar or hated him.
    iv) Everyone is loyal to someone.

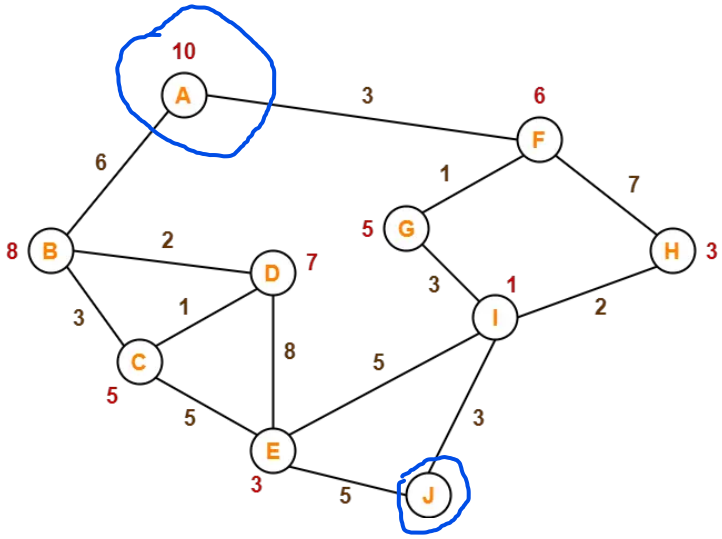
v) People only try to assassinate rulers they aren't loyal to.
vi) Marcus tried to assassinate Caesar.
vii) Every gardener likes the sun.
viii) Not Every gardener likes the sun.
ix) You can fool some of the people all of the time.
x) Everyone is younger than his father.

12. Solve the following using A* Algorithm

a) The numbers written on edges represent the distance between the nodes, while the numbers written on nodes represent the heuristic values. Find the most cost-effective path to reach from start state A to final state G using the A* Algorithms.

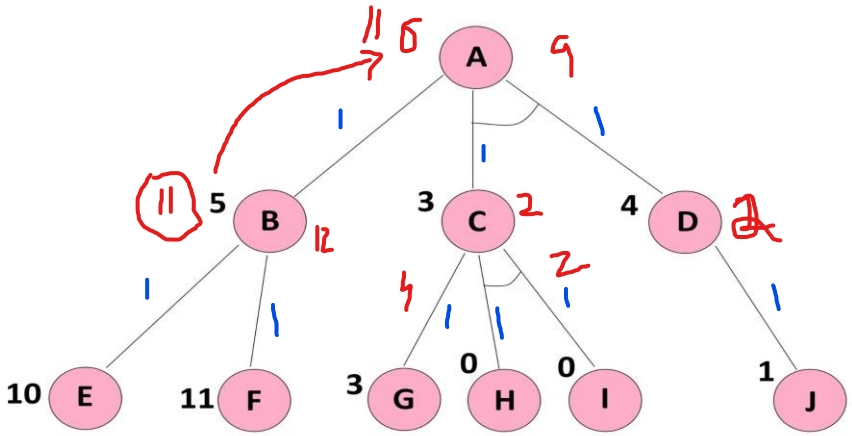


b) Find the most cost-effective path to reach from start state A to final state J using A* Algorithms.

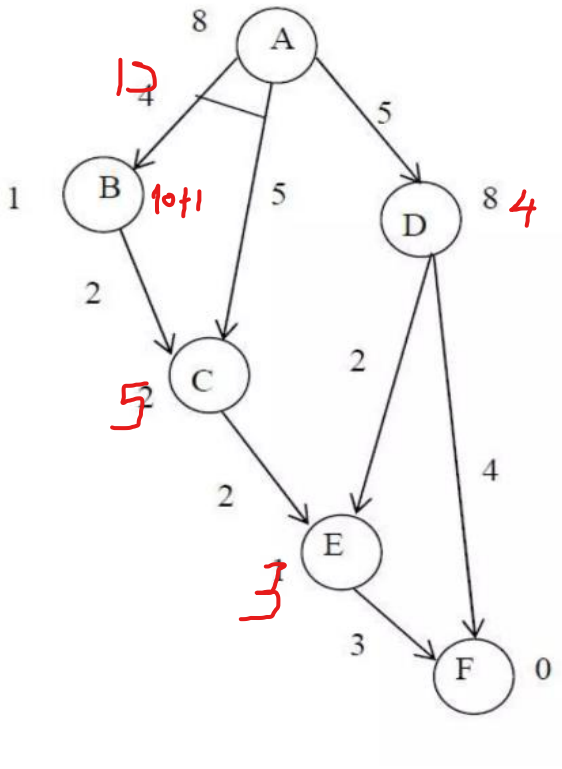


13. Solve the following using AO* Algorithm

a) For the following graph consider node A as starting node. Find the shortest path using AO* algorithm. Assume that the edge cost for all nodes is given=1 and heuristic values are shown in the graph.



b) For the following graph consider node A as starting node. Find the shortest path using AO*



14. Explain in detail branch and bound algorithm with appropriate example.