Nirma University

Institute of Technology

Semester End Examination (IR), December - 2021

B. Tech. in Computer Engineering, Semester-VII

IT724 Artificial Intelligence

Time: 2 Hour | Max Marks: 50

Instructions:
1. Attempt all questions.
2. Figures to right indicate full marks.
3. Assume suitable assumptions if required and specify them.

Q-1 **Answer the following.** **[10]**

A) CO1 Taking an example of Blocks-World Problem, explain how does a local maxima problem occur using "local" heuristic? Rewrite the heuristic function in such a way that the local maxima is resolved. **05**

B) CO3 Consider the following statements and assume additional knowledge if required. **05**

1. Rajan likes all kind of food.
2. Apple and Chicken are food
3. Anything anyone eats and is not killed is food.
4. Ajay eats peanuts and still alive

Translate the above statements into clausal form. Prove that "rajan likes peanuts" using resolution process.

Q-2 **Answer the following.** **[10]**

A) CO3 Consider Missionaries and cannibals problem :- **06**

i. Analyze the problem with respect to seven problem characteristics
ii. Represent the problem in state space representation
iii. Give the one possible solution mentioning production rules

Give the one possible solution mentioning production rules.

B) CO3 Critically discuss about built in predicate cut(!) and fail in PROLOG. **04**

Q-3 **Answer the following.** **[10]**

A) CO3 What is Dempster Shafer Theory? Apply the theory to the real-life example and justify its usefulness. **07**

OR

A) CO2 Taking an example of "Robot Arm Navigation", explain the mechanism of Means-Ends-Analysis technique. **07**

B) CO1 When would breadth first search works better than best first search? Justify your answer by suitable example. **03**

Q-4 **Answer the following.** **[10]**

A) CO3 Write a program in PROLOG to remove the n^{th} element from the list of integers. Read n from the user. **04**

B) CO2 Solve the following crypt arithmetic problem step-by-step: **06**

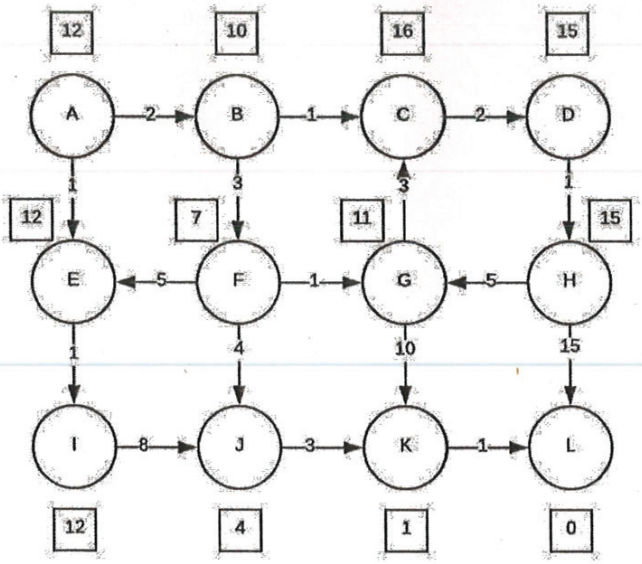
SEND + MORE = MONEY

OR

B) CO2 What is meant by "Annealing Schedule"? What are its components? Under which situation, Simulated Annealing behaves as Simple Hill Climbing method? **06**

Q-5 **Answer the following.** **[10]**

A) CO2 Consider the following search space. In this state space A is the starting state. The values written in square box are heuristic values of that respective state. The value written on arrow is the cost of moving from one state to another state. Trace A* algorithm and find out optimal path. Cleary maintain open and closed queue. **05**



B) CO2 What are Alpha-Beta cutoffs in the context of Minimax search algorithm? What are its significance? How are they beneficial? Discuss with a suitable example. **05**