

MCA 5th Sem-2019

Time: 3 Hours

Full Mark: 70

(Answer all questions and the figures in the right hand margin indicates marks)

1)

- a) Explain Searching as a problem solving strategy in Artificial Intelligence . Define State space search. [6]
- b) On a river bank there are 3 missionaries and 3 cannibals. There is one boat available that can hold up to 2 people. They will use the boat to cross the river. If the cannibals outnumber of the missionaries on the either side of the river bank, the missionaries will get eaten. With state space search representation, how can the boat be used to safely carry all missionaries and cannibals? [8]

OR

- a) Write short note on Constraint Satisfaction Problem. [6]
- b) For the problem shown below, conditions to be met are I) values for the letters are assigned 0 to 9 only ii) no two letters have same value iii) If same letter occurs more than once, it must be assigned the same digit each time iv) The Sum of the digits must be as displayed in problem. Solve this Crypto arithmetic problem. [8]

S E N D
 + M O R E

 M O N E Y

2)

- a) Write basic search algorithm in artificial intelligence. How can this algorithm be modified to breadth first search and depth first search algorithm. [6]
- b) Compare and contrast Blind Search with Heuristic Search. Analyse Best first search with example.[8]

OR

- a) 8 Queen Problem: Queens should be placed in the 8 by 8 chessboard so that none is attacked. Attack occurs when two queens are in same row or same column or same diagonal. Represent this problem as a state space search problem. [8]
- b) Explain with examples, forward chaining as inference mechanism. What is Unification in forward chaining? [6]

3)

a) What is propositional logic? How predicate logic has better representational ability over propositional logic. [6]

b) Convert the following sentences into first order predicate logic form: [8]

i) Everyone likes someone.

ii) All Romans were either loyal to Ceaser or hated him.

iii) All wise people are humble.

iv) People try to assassinate rulers they are not loyal to.

OR

a) As inference mechanism, define with examples Modus Ponens, Modus Tollens and Chain rule. What is Conjunctive Normal Form (CNF) .Why it is needed? [8]

b) The hypotheses given are: If a tringle is equilateral then it is isosceles. If a triangle is isosceles then two sides AB and AC are equal. If AB and AC are equal then angle B and Angle C are equal. Prove by resolution, that ABC is an equilateral tringle. [6]

4)

What is neural network? Show the model of an artificial neuron with a diagram. Distinguish between single layer feed and multi-layer feed forward network. [14]

OR

Write notes on: [14]

- i. Supervised vs unsupervised learning
- ii. Decision tree

5)

a) What is planning? Define State, Actions and Goal in planning. [6]

b) Describe Bayesian network for dependent propositions. [8]

OR

a) What is Natural Language Processing? Explain the Steps in NLP. [8]

b) The boy ate an apple. Show how this sentence (part of language) is related to correct grammar. Construct a tree for this. [6]

