

BE2-R4: ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS

NOTE:

1. Answer question 1 and any FOUR from questions 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

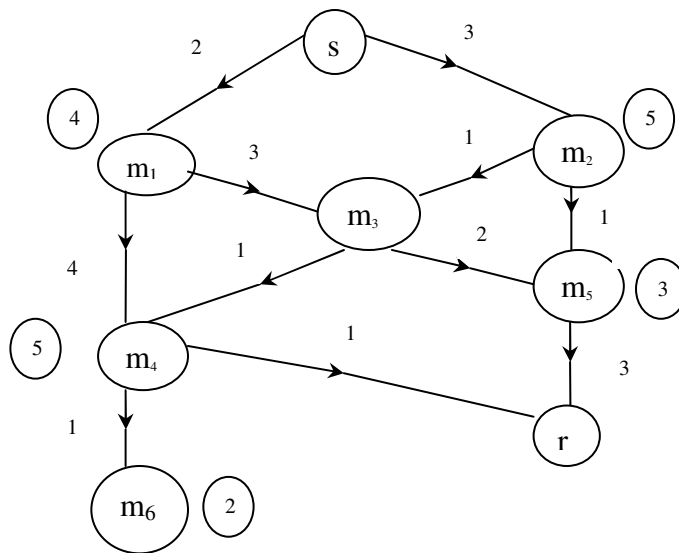
Time: 3 Hours

Total Marks: 100

1.
 - a) What is artificial intelligence? What are the goals?
 - b) Why prolog is declarative language?
 - c) What is state space search? Give some example.
 - d) What is the difference between crisp and fuzzy logic?
 - e) Why game tree is called an AND OR tree?
 - f) Define Biological Neuron.
 - g) What type of problems are solvable by soft computing?

(7x4)

2.
 - a) What are the advantages and disadvantages of BFS and DFS?
 - b) Why DFS and BFS are called blind search method?
 - c) Apply A on the following graph. Find the solution path from the source node s to the goal node r.



(8+2+8)

3.
 - a) Explain fuzzy membership function. How to design fuzzy rule base system?
 - b) What is Constant Satisfaction Problem?
 - c) What is N-Queens Problem? Find the solution for 4-Queens problem by back tracking with explanation of each step.

(8+3+7)

4.

- a) 2 Jugs of capacity 8 and 5 Ltr. with no markings. Problem is to measure out exactly 4 Ltr. from a Jug containing 20 Ltr. or more water

Possible operations are: -

- i) Filling of a Jug to its capacity. (fill)
 - ii) Emptying the Jug into the other Jug. (empty)
 - iii) Transfer the content of one Jug to the other until the other Jug is filled to its capacity or the pouring Jug becomes empty.
- b) Define an expert system. What is the structure of an expert system? Explain. State merits and demerits of expert system. Name three knowledge representation approaches.

(8+10)

5.

- a) Define Artificial Neural Network. What is stability-plasticity dilemma of a neural network?
- b) Describe a structure of an artificial neuron network.
- c) Explain activation function of ANIX.

(6+6+6)

6.

- a) Explain Back Propagation Learning of ANN.
- b) Explain Kohonen Network.
- c) Differentiate between Supervised and Non-Supervised Learning.

(6+6+6)

7.

- a) Given fact clauses

parent(tom,bob)
parent(pam,bob)
parent(tom,lif)
parent(bob,ann)
parent(bob,pat)
parent(pat,jim)
male(tom)
male(bob)
female(lif)
female(ann)
female(pat)
female(jim)

Write a rule clause to find who is the sister of whom?

- b) Explain how cut and fail predicates are used in PROLOG to change the execution of program.
- c) What do you mean by unification in PROLOG? Explain with an example.
- d) Write a PROLOG program to implement factorial of a number.

(4+6+4+4)