

## BE2-R4: ARTIFICIAL INTELLIGENCE & 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

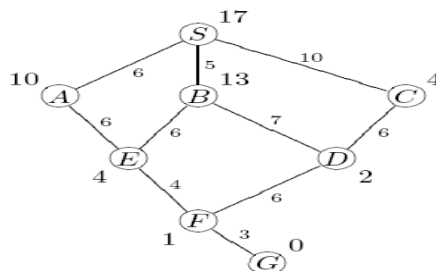
1.
  - a) Briefly describe the Turing Test for intelligence. What does the Turing test say about the nature of intelligence?
  - b) Differentiate between Forward and Backward chaining.
  - c) Rules and chaining provide more flexibility and thus more usefulness over logic. Is it a correct statement? Justify.
  - d) Describe how the branch and bound technique could be used to find the shortest solution. What are the disadvantages of it?
  - e) Differentiate between non monotonic reasoning and non-monotonic logic.
  - f) Explain Bio-logical model of Neuron.
  - g) Elaborate Alpha-Beta cutoffs in Minimax Search.

(7x4)

2.
  - a) Let Y and R be two fuzzy sets of young and rich people. What is the member grade of person being young and rich if the member grade of a person being young is 0.8 and being rich is 0.7?
  - b) How the frames are organized? What are the advantages and disadvantages of frames?
  - c) Convert these sentences to propositional logic using the logical rules. Proof by resolution that "it is good to walk" is a logical consequence of the given information.
    - i) It is raining, it is snowing or it is dry.
    - ii) It is warm.
    - iii) It is not raining.
    - iv) It is not snowing.
    - v) If the weather is nice, then it is good to walk.
    - vi) If the weather is dry and warm, the weather is nice

(6+6+6)

3.
  - a) Trace the operation of A\* algorithm for the following example (figure).



- b) Discuss different problems solved by an expert system.
- c) Justify- NLP is considered hallmark of human intelligence.

(10+4+4)

4.

- a) How Goal stack planning is different from the planning of a system?
- b) Discuss Dempster-Shafer theory with suitable example.
- c) Which are the factors influencing Back-propagation Neural Network Training?

(6+6+6)

5.

- a) Draw the parse tree for:  
Bill printed the .init file
- b) The rate at which ANNs learn depends upon several controllable factors. Describe such factors in detail. What would be the ideal learning rate?
- c) Give the difference between Best First Search and Hill Climbing technique.
- d) Perform the mini-max algorithm on the tree in figure, first without and later with  $\alpha\beta$  pruning. Can the nodes be ordered in such a way that  $\alpha\beta$ -pruning can cut off more branches?

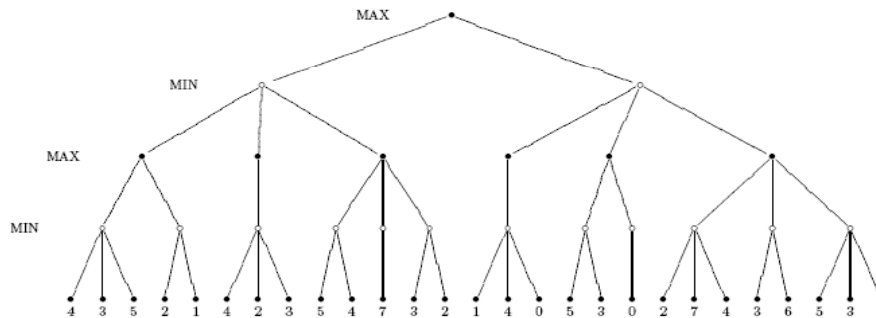


Figure 1: Minimax problem

(3+3+3+9)

6.

- a) Write a prolog program to find the difference between two lists.
- b) Write a Program in PROLOG to find out X is a Member of List or Not.
- c) Explain backpropagation ANN.

(6+6+6)

7.

- a) A game tree is basically AND OR graph. Justify the statement.
- b) Describe how the production system can be used to convert decimal number into binary number.
- c) State and prove Bay's Theorem. Justify the use of Bay's theorem in Bayesian Network.

(6+6+6)