

## BE2-R4 : ARTIFICIAL INTELLIGENCE & NEURAL NETWORKS

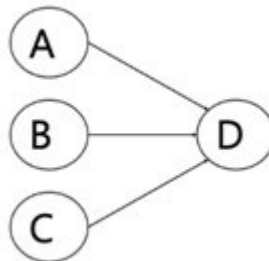
**NOTE :**

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) Explain the Turing Test that is widely popular the test of Artificial Intelligence.  
 (b) Briefly discuss about recurrent neural networks. How are they different from feed forward ?  
 (c) Describe the different types of supervised learning problems briefly.  
 (d) What do you understand by word sense disambiguation ? Explain using an example.  
 (e) What is a parser ? What are the different types of parsers ?  
 (f) What are productions systems ? What are their different types ?  
 (g) Briefly explain the Hebb's rule of learning in artificial neural networks. (7x4)
  
2. (a) What are the different types of popular blind search algorithms ? Explain the working of each using suitable examples. Which of these algorithms provides the cheapest solution in terms of distance from starting node ?  
 (b) What are heuristics ? Explain Hill Climbing as a backward search algorithm. Discuss the 3 issues of Hill Climbing and their possible solutions. (9+9)
  
3. (a) What do you understand by Certainty Factors in reasoning ? Explain. How are they calculated ? Given the following situation, derive the expression for estimating final certainty factor values.



- (b) Write a Prolog program to solve the water jug problem. There are two 2 jugs, a 4 litre one and a 3 litre one. Neither has any measuring marker on it. There is a pump that can be used to fill the jugs with water. How can we get exactly 2 litres of water in the 4-litre jugs ? (9+9)
  
4. (a) Explain the back propagation algorithm for updating the weights of an artificial neural network.  
 (b) Describe Knowledge-based systems and their major components using a suitable diagram. Give 2 examples of knowledge based systems. (9+9)

5. (a) Differentiate between an artificial and a biological neuron using suitable diagram. Discuss 1 activation functions using suitable diagrams for their respective responses.  
(b) Discuss Frames for knowledge representation using suitable examples. Highlight their advantages and disadvantages. (9+9)
6. (a) What are the different issues in Knowledge representation ? Discuss any five.  
(b) What are Scripts ? Discuss the major components of scripts. (9+9)
7. (a) What do you understand by natural intelligence and artificial intelligence ? Explain with example.  
(b) Discuss the various steps involved in Natural Language Processing by computers. (9+9)

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