



**GIET UNIVERSITY, GUNUPUR – 765022**  
 B. Tech (Third Semester - Regular) Examinations, December – 2022  
**21BCMPE23011– Artificial Intelligence and Expert Systems**  
 (CSE(AIML))

Time: 3 hrs

Maximum: 70 Marks

**Answer ALL questions**  
 (The figures in the right hand margin indicate marks)

**PART – A** **(2 x 5 = 10 Marks)**

Q.1. Answer **ALL** questions

- |  | CO # | Blooms Level |
|--|------|--------------|
| a. Differentiate between AI, deep learning and machine learning?         | 1    | 1            |
| b. Explain with example the Means-ends analysis.                         | 1    | 2            |
| c. Differentiate between Modus Ponens and Modus Tollens inference rules. | 2    | 3            |
| d. Write down the advantages of NLP                                      | 4    | 2            |
| e. Explain Phonetic errors with suitable example.                        | 3    | 1            |

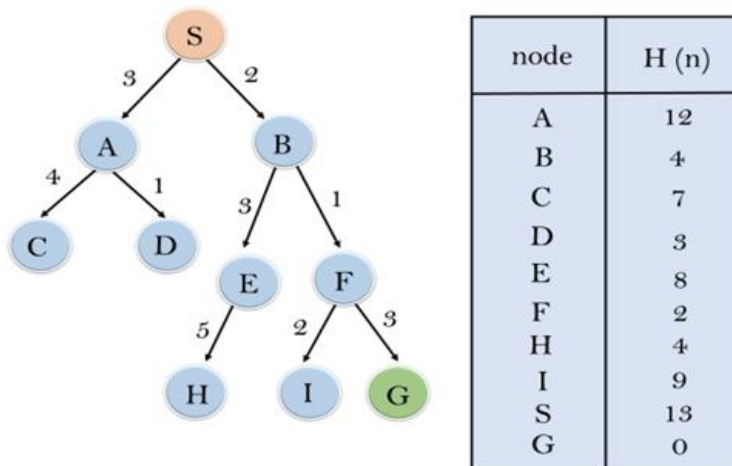
**PART – B** **(15 x 4 = 60 Marks)**

Answer ALL questions

- |   | Marks | CO # | Blooms Level |
|---|-------|------|--------------|
| 2. a. Define Means End Analysis. Perform the operation in the following diagram using backward actions. | 5     | 1    | 2            |



- |   |    |   |   |
|---|----|---|---|
| b. Briefly describe the Best First Search algorithm with an example and calculate the following. Compare both the cost to the goal state using heuristic and normal values and gives comments about your results: | 10 | 1 | 2 |
|---|----|---|---|



(OR)

- |  |   |   |   |
|--|---|---|---|
| c. Briefly discuss the application of Artificial Intelligence in different sectors.  | 9 | 1 | 2 |
| d. Explain the following uninformed search strategies with examples.<br>(i) Breadth First Search, (ii) Depth First Search  | 6 | 1 | 1 |
| 3.a. Apply the method of resolution for the following example:<br>The facts are 1. If it is a sunny and warm day you will enjoy it.<br>2. If it is raining you will get wet. | 8 | 2 | 3 |

3. It is a warm day, 4. It is Raining, 5. It is Sunny.

Goal: You will enjoy

- b. Write down the three forms of reasoning inductive, abductive and deductive reasoning? Explain it with suitable example? 7 2 2

(OR)

- c. Differentiate between forward versus backward reasoning with suitable examples. 5 2 2

- d. Consider the following Knowledge Base: 10 2 3

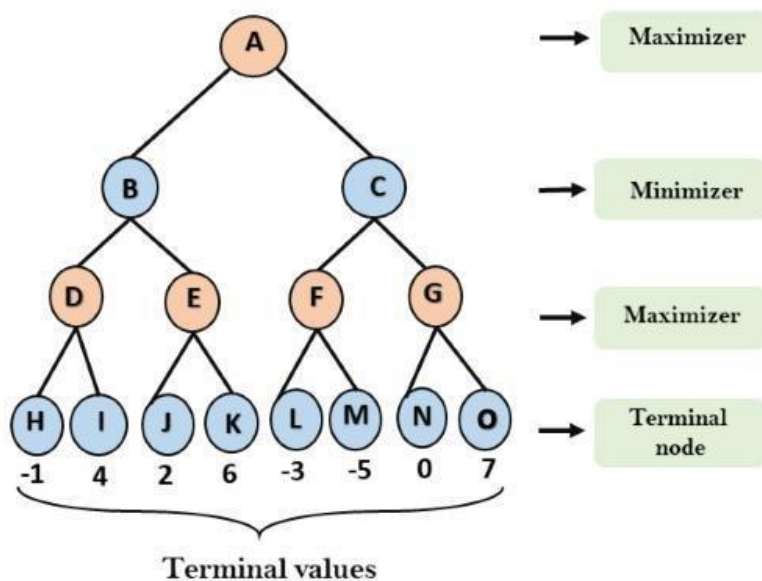
John likes all kind of food.  
 Apple and vegetable are food  
 Anything anyone eats and not killed is food.  
 Anil eats peanuts and still alive  
 Harry eats everything that Anil eats.  
 Goal: John likes eanuts.

Use predicate logic and apply resolution method to prove that the goal is derivable from the given knowledge base

- 4.a. Describe the goal state planning for the block world problem with start state represented as:  $ON(B,A) \wedge ONTABLE(A) \wedge ONTABLE(C) \wedge ONTABLE(D) \wedge CLEAR(B) \wedge CLEAR(C) \wedge CLEAR(D) \wedge ARMEMPTY$ . 8 3 3

The goal state represented as:  $ONTABLE(A) \wedge ONTABLE(B) \wedge ON(C,A) \wedge ON(D,B) \wedge CLEAR(C) \wedge CLEAR(D) \wedge ARMEMPTY$

- b. Briefly discuss the Min-Max procedure for the following graph: 7 3 3



(OR)

- c. Define Natural Language Processing. Discuss the five main components of NLP with block diagram. 10 3 2

- d. Define as discuss various spell checking techniques. 5 3 2

- 5.a. List out the various components of Natural Language Processing. 8 4 1

- b. Define expert system. Write down examples, characteristics, benefits and limitations of the expert system. 7 4 2

(OR)

- c. Define Learning. Describe and Classify learning based on feedback. 8 4 1

- d. Differentiate between neural net learning and Genetic Learning. 7 4 2

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