



GIET UNIVERSITY, GUNUPUR - 765022

B. Tech (Third Semester) Examinations, December - 2023 21BCMPE23011 / 22BCMPE23011 - Artificial Intelligence & Expert Systems (CSE(AIML))

Time: 3 hrs

Maximum: 70 Marks

(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. What is the difference between AI, deep learning and machine learning? | CO1 | K1 |
| b. Explain the Turing Test. | CO1 | K2 |
| c. From the following statement, identify the predicate, variable and quantifier - "All mammals are warm-blooded" | CO2 | K1 |
| d. What is MiniMax concept in game tree? | CO2 | K1 |
| e. What was DENDRAL used for? | CO4 | K1 |

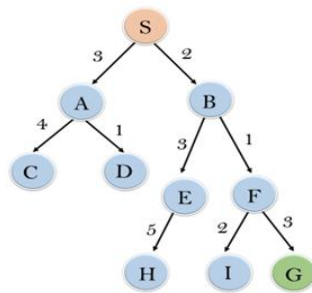
PART - B

(15 x 4 = 60 Marks)

Answer **ALL** questions

2. a. Differentiate between Uninformed Search and Informed Search. Calculate the Path using Best First Search for following. Compare both the cost to the goal state using heuristic and normal values and give comments about your results.

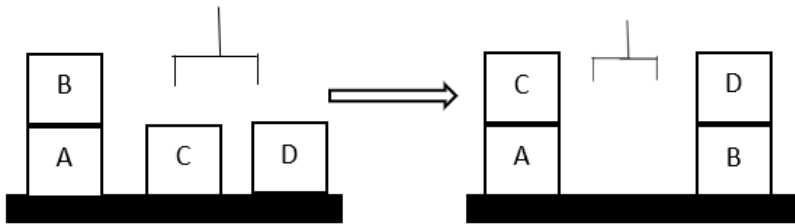
Marks	CO #	Blooms Level
8	CO1	3



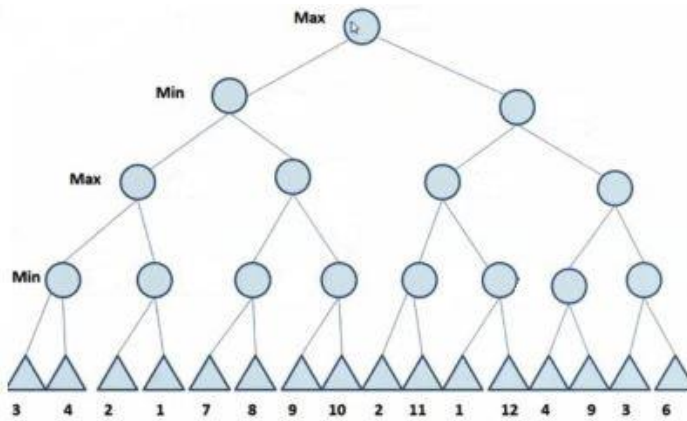
node	H (n)
A	12
B	4
C	7
D	3
E	8
F	2
H	4
I	9
S	13
G	0

- | | | | |
|--|---|-----|---|
| <p>b. Write a short note on-</p> <p style="margin-left: 20px;">(i) Bidirectional-Search</p> <p style="margin-left: 20px;">(ii) Means-End Analysis</p> <p style="text-align: center;">(OR)</p> <p>c. Write down the mathematical way of representing Water Jug problem? We have two jugs of capacity 4L and 3L. How can we get 2L of water in the 4L of jugs with minimum steps?</p> <p>d. If SEND + MORE = MONEY, then M+O+N+E+Y=? Solve it using cryptarithmic problem.</p> | 7 | CO1 | 2 |
| <p>3.a. Given below are some statements, represent them using Instance and ISA relationships. Explain the initial steps or representation.</p> <ol style="list-style-type: none"> 1. Marcus was a man 2. Marcus was a Pompeian 3. All Pompeians were Romans 4. Caesar was a rule 5. All Pompeians were either loyal to Caesar or hated him <p>b. Differentiate between forward versus backward reasoning with suitable examples and a neat diagram.</p> | 8 | CO2 | 2 |
| (OR) | 7 | CO2 | 2 |

- c. Write a short note on – 8 CO2 2
 (i) KBA
 (ii) Frame Representation
- d. Explain down the three forms of reasoning-inductive, abductive and deductive reasoning? Explain it with suitable example? 7 CO2 2
- 4.a. Given Below is the Initial State and Goal State of the Goal Stack Planning. Describe the Internal Action and the Resultant States at each Steps. 8 CO3 3
- **Start State-** $ON(B,A) \wedge ONTABLE(A) \wedge ONTABLE(C) \wedge ONTABLE(D) \wedge CLEAR(B) \wedge CLEAR(C) \wedge CLEAR(D) \wedge ARMEMPTY$
 - **Goal State-** $ONTABLE(A) \wedge ONTABLE(B) \wedge ON(C,A) \wedge ON(D,B) \wedge CLEAR(C) \wedge CLEAR(D) \wedge ARMEMPTY$



- b. Write a short note on- 7 CO3 2
 (i) MINIMAX
 (ii) Alpha-Beta Pruning
 (OR)
- c. Perform MiniMax procedure on this game tree and mention the working algorithm and properties of the minimax search. 8 CO3 3



- d. What is blocks world problem? What are the Predicates and Actions in the Blocks world Problem? 7 CO3 2
- 5.a. Write a short note on- 8 CO4 2
 (i) Expert Systems
 (ii) Genetic Learning
- b. Describe the components of Expert Systems with a neat diagram. Explain any two real world examples of ES. 7 CO4 2
 (OR)
- c. Write short notes on: 8 CO4 2
 (i) Learning by taking advice
 (ii) Rote learning
- d. Define Learning. Explain any four methods of learning. 7 CO4 2
- End of Paper ---