

**VIT**Vellore Institute of Technology
(Approved as Deemed University under section 3 of UGC Act, 1956)

REG.NO.:

SENSE
CONTINUOUS ASSESSMENT TEST - I
VIII SEMESTER 2024-2025

SLOT:D1

Programme Name & Branch : B. Tech & ECE
Course Code and Course Name : BECE309L & Artificial Intelligence and Machine Learning
Faculty Name(s) : Dr. J. Christopher Clement
Class Number(s) : VL2024250500709
Date of Examination : 30/1/2025
Exam Duration : 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)

Q. No	Question	M	CO	BL
1.	An agent is navigating a 3×3 grid. The goal-based agent must collect all required items and reach the goal while avoiding obstacles. The grid layout is S: Start position at (0, 0). G: Goal position at (2, 2). I: Item to collect at (0, 2). O: Obstacle at (1, 1). The rule is The agent must collect the item I before reaching the goal G. The agent cannot move diagonally. The agent must avoid the obstacle O. Each move (up, down, left, or right) costs 1 unit and collecting an item costs 2 units. Determine the optimal path for the agent to collect the item I and reach the goal G while avoiding the obstacle. Compute the total cost for the agent to complete the task.	10	1	L2
2.	Define the meaning of PEAS Representation in Artificial Intelligence. If the following are the agents, provide their PEAS descriptions: i. Self-Driving Car ii. Autonomous Delivery Drone iii. Spam Email Classifier iv. AI Personal Assistant (e.g., Alexa, Siri)	10	1	L2
3.	Show how the search procedure proceeds in the tree by using depth first and breadth first algorithm (starting from A and ending at G) of the graph shown in Fig. 1.	10	2	L3



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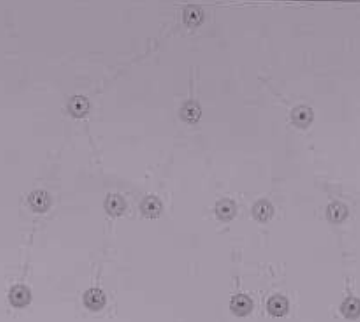


Fig.1

4. Check for the admissibility of A* algorithm for the given heuristic function in Table 1 and for the graph shown in Fig. 2.



Fig.2

Node	Heuristic $h(n)$
S	6
A	5
B	3
C	3
D	2
G	0

Table 1

5. Consider the following logical statements:
- If it rains R , the ground will be wet W or the sun will not shine S
 - If the ground is wet W , then there will be no football practice P
 - If the sun does not shine $\neg S$, then it is cloudy C
 - It is raining R
 - It is not cloudy
- Rewrite each statement in conjunctive norm form
Determine whether the conclusion "There will be no football practice $\neg P$ " is valid.

10

2

L3

10

3

L3

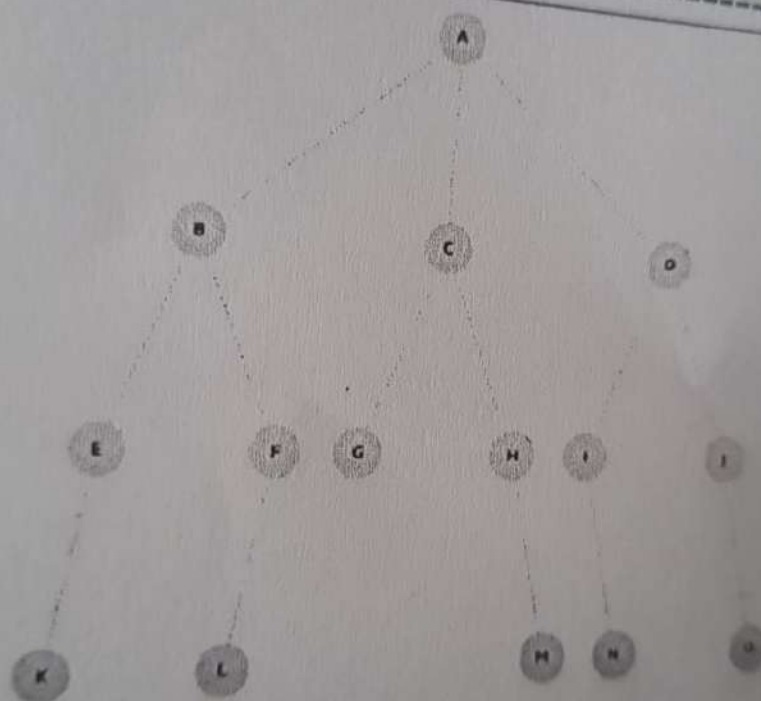


Fig.1