Name:.....
Roll No:.....

MAR ATHANASIUS COLLEGE OF ENGINEERING (AUTONOMOUS),
KOTHAMANGALAM - 686666
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B.TECH FIRST SERIES EXAMINATION, August 2026 (S5 CS, DS, AIML)
B24CS3T05 ARTIFICIAL INTELLIGENCE

Max. Marks: 40 Duration: 1.5 Hours

PART A

Answer all questions. Each question carries 3 marks.

1. Define any three principles of Responsible AI.

(CO1)

2. Define Goal-Based Agent and Utility-Based Agent with an example of each.

(CO1)

3. Compare the four performance measures of uninformed search algorithms.

(CO2)

4. Formulate the 8-puzzle problem as a search problem by specifying its components, where the initial and goal states can be any valid configurations.

(CO2)

PART B

Answer all questions. Each question carries 14 marks.

5. (a) Explain the four approaches to defining Artificial Intelligence: Acting Humanly, Thinking Humanly, Thinking Rationally and Acting Rationally, with suitable examples for each approach.

(CO1) (8 marks)

(b) Explain the PEAS description for the following intelligent agents. Also, describe the type of environment for each.

i. Soccer-playing agent
ii. Netflix online recommendation system

VISION

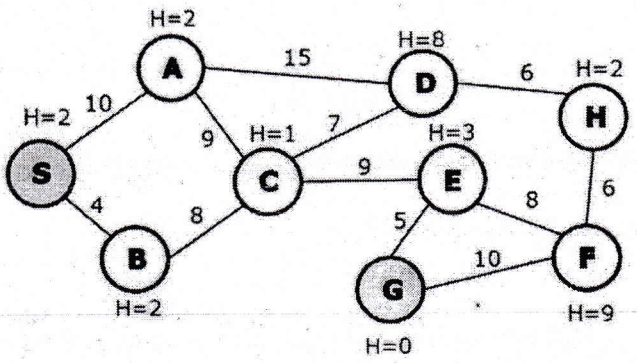
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- Mould disciplined and Socially Committed engineers capable of professional leadership.
- Promote theoretical and practical understanding, along with critical thinking and logical reasoning.

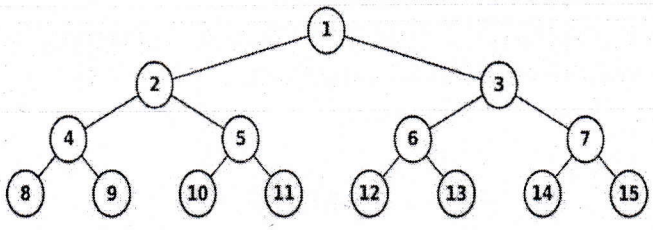
(CO1) (6 marks)

6. (a) For the following figure S is the start state and G is the goal state. Show the order in which nodes are explored, solution path and path cost for A* algorithm. Explain the A* algorithm. [in case of tie use lexicographic order]



(CO2)(9 marks)

(b) Consider a state space given below.



Assume that at each node, children are visited in left-to-right order, i.e., the leftmost child is expanded first.

i. If the goal state is numbered '11', list the order in which the states will be visited using:
   A. Breadth First Search
   B. Depth First Search
   C. Depth Limited Search with a limit 2 (depth of the root is 0)
   D. Iterative Deepening Depth First Search

ii. If Iterative Deepening Depth First Search is used to traverse the state space, how many times will the state space tree be constructed to reach the goal?

(CO2)(5 marks)

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