



## School of Computer Science and Engineering

Winter Semester 2023-24

Continuous Assessment Test – 1

SLOT: F1+TF1

Programme Name & Branch: M.Tech. (Integrated) Computer Science and Engineering,  
M.Tech. (Integrated) Computer Science and Engineering with Specialization in Data Science

Course Name & Code: Artificial Intelligence and Expert Systems (CSI3003)

Class Number (s): VL2023240502537, VL2023240502468

Faculty Name (s): Dr. Natarajan P, Dr. Kamanasish Bhattacharjee

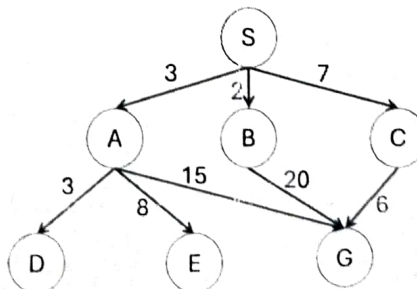
Exam Duration: 90 Min.

Maximum Marks: 50

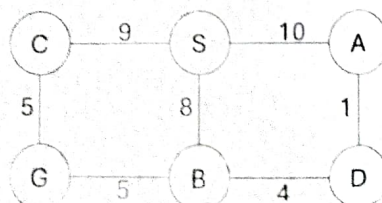
### General instruction(s):

No printed material should be permitted.

- | Q.No. | Question  | Marks |
|-------|---|-------|
| 1.    | (a) Differentiate between Simple, Model-based, Goal-based, and Utility-based Reflex Agents.   | 6     |
|       | (b) Write down the PEAS description of the task environment for <b>Autonomous Mars Rover</b> agent.   | 4     |
| 2.    | (a) Explain the Separation Property of Graph Search Algorithm with appropriate visualization.   | 5     |
|       | (b) Write down the Completeness, Optimality, Time Complexity, and Space Complexity of BFS, DFS, and IDDFS [ $b$ = branching factor, $d$ = depth of the shallowest solution, $m$ = maximum depth of the search tree, $l$ = depth limit.] | 5     |
| 3.    | Perform Uniform Cost Search on the directed graph given below and present it in a tabular form with Frontier List, Expand List, and Explored List. [S = Start Node, G = Goal Node]  | 10    |



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|----|--|----|
| 4. | Perform IDA* algorithm on the undirected graph given below to find the best path from node S to node G. Write down the Threshold value and Visited node list for each iteration. | 10 |
|----|--|----|



Node	Heuristic
S	0
A	0
B	4
C	3
D	0
G	0

5 ✓

Perform Alpha Beta Pruning on the tree given below. After completing the algorithm, show node values, final alpha and beta values for each node, and determine the decision value. What are the pruned nodes in the tree? 10

