



SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS

CAT-I
FALL SEMESTER 2026-2027

SLOT: B1+TB1

Programme Name & Branch : B.Tech Computer Science and Engineering (AI & DE) ,
B.Tech Computer Science and Engineering (Cyber Security)

Course Code and Course Name : BCSE306L Artificial Intelligence

Faculty Name(s) : Prof. Jayalakshmi P, Prof. Benjula Anbu Malar M B,
Prof. Siva Shankari R

Class Number(s) : VL2026270102516, VL2026270102522, VL2026270102518

Date of Examination : 10th August 2026

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)
 1. Evaluate Artificial Intelligence (AI) methods and describe their foundations.
 2. Apply basic principles of AI in solutions that require problem-solving, inference, perception, knowledge representation and learning.

Q. No	Question	M	CO	BL
1.	A technology company claims to have developed an AI that learns any new skill, reasons like humans, communicates naturally, solves scientific problems, and consistently makes better decisions than the world's leading experts. Questions 1. Is this AI an example of Narrow AI, General AI, or Super AI? Justify your answer. 2. Explain the four AI views in detail, which AI view best describes this system? Justify.	10	1	2
2.	A company is developing AI systems for different applications: 1. An autonomous taxi that drives on city roads with pedestrians, traffic signals, and changing weather. 2. A robotic arm in a car manufacturing factory that repeatedly assembles car parts. Analyze each application and identify the appropriate AI environment type based on the following characteristics: ○ Fully Observable or Partially Observable ○ Deterministic or Stochastic ○ Episodic or Sequential ○ Static or Dynamic ○ Discrete or Continuous ○ Single-Agent or Multi-Agent Justify your answers with suitable reasons.	10	1	5



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3.	a) A smart traffic management system monitors traffic density at multiple intersections. It remembers previous traffic patterns, predicts congestion, changes signal timing dynamically, and continuously improves its decisions based on daily traffic data. Which intelligent agent best represents this system? Explain your answer.	5		
	b) A city installs an automatic street lighting system. The system turns the lights ON whenever it becomes dark and turns them OFF when daylight is detected. It does not store any previous information or predict future weather conditions. Identify the type of intelligent agent used. Justify your answer. Why is this agent not suitable for handling unexpected situations like heavy fog during the daytime?	5	1	3
4.	a) Consider the tree shown below. The numbers on the arcs are the arc lengths. <pre> graph TD A((A)) -- 1 --> B((B)) A -- 3 --> C((C)) B -- 1 --> D((D)) B -- 1 --> E((E)) C -- 1 --> G((G)) C -- 2 --> H((H)) D -- 1 --> F((F)) F -- 2 --> K((K)) F -- 2 --> L((L)) H -- 1 --> I((I)) H -- 1 --> J((J)) </pre> Assume that the nodes are expanded in alphabetical order when no other order is specified by the search, and that the goal is state G. No visited or expanded lists are used. What order would the states be expanded by each type of search? Stop when you expand G. Write only the sequence of states expanded by each search. Perform BFS, DFS and IDS for the above tree structure and show the traversal.	5	2	3
	b) A smart warehouse robot must pick products from different shelves and deliver them to the packing station. The robot can carry only one package at a time. It must avoid obstacles and minimize travel distance. Formulate the search problem. Define all components of problem formulation. Explain which search algorithm would be most suitable.	5		
5.	Consider the graph shown below where the numbers on the links are link costs and the numbers next to the states are heuristic estimates. Note that the arcs are undirected. Let A be the start state and G be the goal state.	10	2	3



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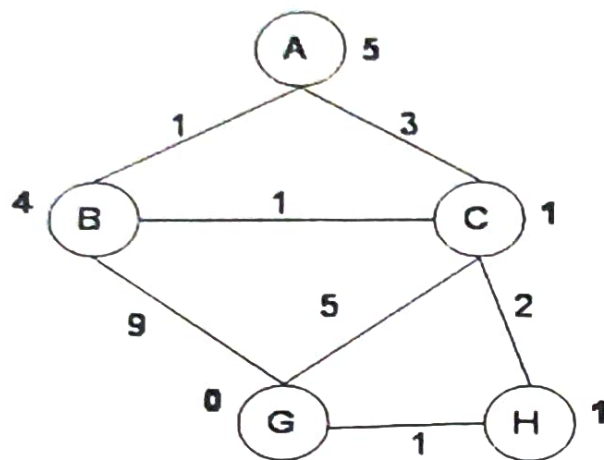
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Perform Greedy Best First Search and A* search with a strict expanded list on this graph. At each step, show the path to the state of the node that's being expanded, the length of that path, the total estimated cost of the path, and the current value of the expanded list (as a list of states). The number near the nodes are the heuristic value, Compare the performance measure of both the searches. Identify which search provides optimal solution w.r.t the path cost.
