



VIT

Vellore Institute of Technology
(Approved by the University Grants Commission, U.G.C., Act, 1956)

School of Computer Science and Engineering Winter Semester 2023-24 Continuous Assessment Test – I

SLOT: B1+TBI

Programme Name & Branch: B.Tech. & Computer Science & Engineering / SCOPE

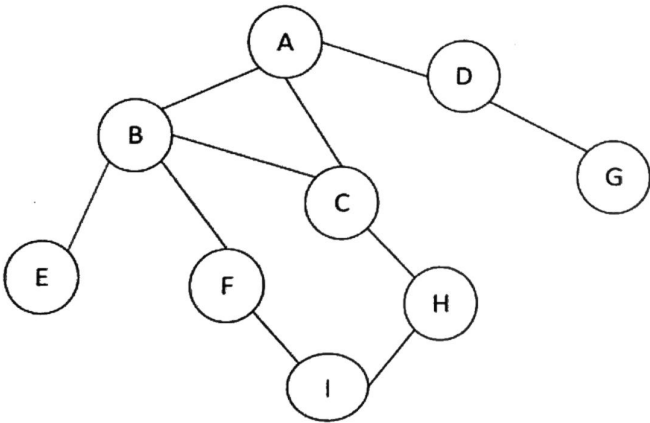
Course Name & Code: Artificial Intelligence & BCSE306L

Class Number (s): Common for all batches

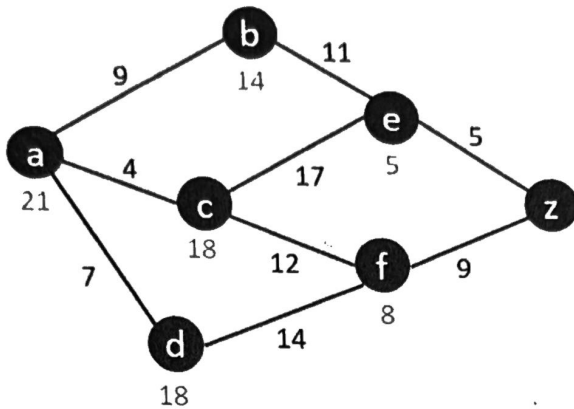
Exam Duration: 90 Min.

Faculty Name (s): All

Maximum Marks: 5*10 = 50

Q. No.	Question (Answer all questions)	Max Marks	CO	BL
1.	<p>a) Describe different approaches to Artificial Intelligence. List the timeline of the evolution of artificial intelligence and briefly describe each period/breakthrough. [5 M]</p> <p>b) Consider an artificial agent learning to play chess, where the agent learns the game's rules and optimal moves through multiple plays and feedback from critics. Which type of agent would be most suitable for a chess-playing agent? Justify your answer. Also, briefly <u>describe</u> the agent architecture with a suitable diagram. [5 M]</p>	10	CO1	BL3
2.	<p>Describe the task environments and their characteristics for the following agents.</p> <p>i. Rental Bike/Car booking ii. Cooking Robot iii. Grocery Delivery iv. Playing Chess</p>	10	CO1	BL4
3.	<p>Apply the following search algorithms to find a path from the node A to G in the given graph: [3 * 2 = 6 M]</p> <p>i) Depth First Search (DFS) ii) Depth-limited search (L=2) iii) Iterative Deepening Search (IDS)</p>  <pre> graph TD A((A)) --- B((B)) A --- D((D)) B --- E((E)) B --- C((C)) C --- F((F)) C --- H((H)) F --- I((I)) I --- H H --- G((G)) </pre> <p>Note: Process the nodes alphabetically for the nodes at the same level.</p> <p>b) Analyze the above algorithms regarding completeness, optimality, time complexity, and space complexity. [4 M]</p>	10	CO2	BL5

4. Apply A* Search algorithm to find the shortest path from a to z using the following graph:



The heuristic values for each node is given below:

Node	a	b	c	d	e	f
$h(n)$	21	14	18	18	5	8

10

CO2

BL5

5. Explain each step of the genetic algorithm with correct terminology in detail using the eight-queen problem and appropriate examples. Calculations must be provided along with the steps when necessary.

10

CO2

BL6