

ROLL NO.

2401920140000

G.L. BAJAJ INSTITUTE OF TECHNOLOGY & MANAGEMENT
GREATER NOIDA

MCA (SEM 3)

SESSIONAL TEST (ODD SEM 2025-26)

Artificial Intelligence (BMC-021)

Faculty Name: Ms. Anju Mishra, Mr. Harshit Munjal

Time: 2:00 Hrs

Max. Marks: 50

- Note: (i) No student will be allowed to leave the examination Room before end of exam.
(ii) Diagram should be neat and clean.
(iii) Mention Question number/section correctly.
(iv) Be precise in your answer.
(v) Do not write anything on question paper except Roll number.

Course Outcomes:

Following are the course outcomes of the subject: -

CO Code	Course Outcome (CO)	Bloom's Level
BMC021.1	Define the meaning of intelligence and study various intelligent agents.	K1
BMC021.2	Understand, analyze, and apply AI searching algorithms in different problem domains.	K2, K3, K4
BMC021.3	Study and analyze various models for knowledge representation	K1, K3
BMC021.4	Understand the basic concepts of machine learning to analyze and implement widely used learning methods and algorithms	K2, K4, K6
BMC021.5	Understand the concept of pattern recognition and evaluate various classification and clustering techniques	K2, K5

Section: A

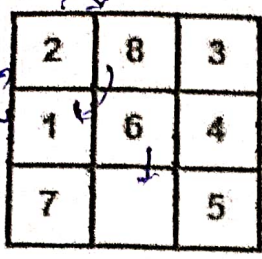
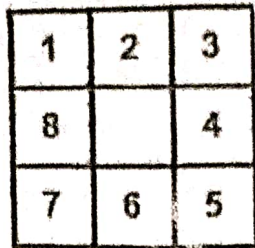
1. Attempt all questions. (2*5= 10)				
Q.No.	Questions	Marks	CO	BL
a)	Explain how AI in robotics has evolved, focusing on one significant breakthrough.	2	BMC021.1	K1
b)	As a consultant, you are designing a home automation system powered by intelligent agents. Your client wants a system that can control the lights, heating, and security automatically based on the environment. Which type of intelligent agent would be most appropriate for this system, and why?	2	BMC021.1	K1
c)	Categorize given examples in Weak AI and Strong AI, with explanation. 1. The popular iPhone's Siri and Amazon's Alexa. 2. Poker	2	BMC021.1	K2
d)	How would you explain the contributions of John McCarthy to AI? Provide an example of how his work might have impacted modern AI applications like voice assistants.	2	BMC021.1	K2
e)	Illustrate with a simple example and discuss main reasons why the Hill-Climbing approach can get stuck during the search process.	2	BMC021.2	K3

Section: B

2. Attempt any four of the following:

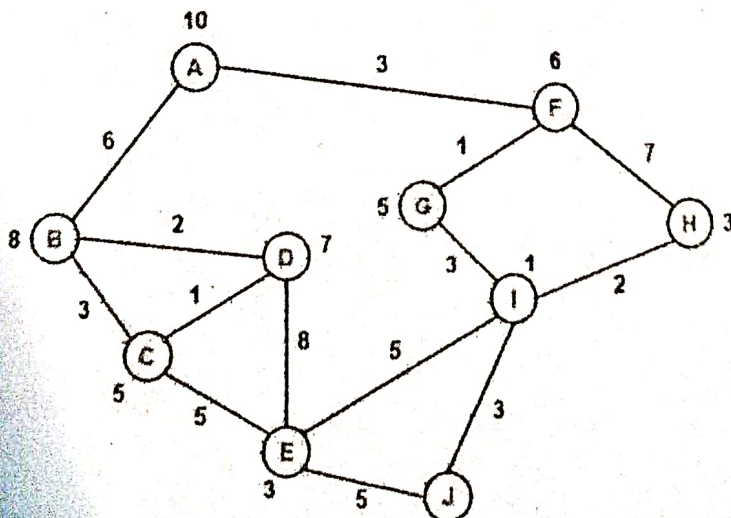
(4*5 = 20)

Q. No	Questions	Mark s	CO	B L
a)	List and discuss five real-life applications of computer vision that demonstrate its importance in artificial intelligence and explain how computer vision acts as the “eyes” of an AI system?	5	BMC021.1	K 1
b)	Identify and discuss five real-world examples of intelligent agents. Classify each example under the correct category: <ul style="list-style-type: none">• Simple Reflex Agent• Model-Based Reflex Agent• Goal-Based Agent• Utility-Based Agent• Learning Agent	5	BMC021.1	K 1
	How does a virtual assistant (like Alexa, Siri, or Google Assistant) understand your spoken commands and respond appropriately?	5	BMC021.1	K 1
	Differentiate BFS and DFS. Find the path for BFS and DFS	5	BMC021.2	K 3
	<pre>graph TD A --- B A --- I B --- C B --- E C --- D D --- H D --- G E --- G F --- G G --- D G --- E</pre>			
	Consider the following graph where nodes represent cities, edges represent possible routes, and the heuristic value (<i>h</i>) represents the estimated distance from each city to the goal city G. Node Connected Nodes (Cost) Heuristic <i>h</i> (<i>n</i>) A(2), B(5) 7 C(2), D(4) 4 D(1), E(3) 5 G(3) 2 G(2) 3 G(5) 4 — 0			K 3
	How A* algorithm traverses this graph to reach the goal node G starting from the source node S. At each step, show the open list, closed list, and the node selected.	5	BMC021.2	

d)	<p>Given a initial stage of 8 puzzle problems and final state.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Initial State</p> </div> <div style="text-align: center;">  <p>Final State</p> </div> </div> <p>Find the most effective path to reach the final state using A* algorithm. Consider $g(n)$= depth of the node and $h(n)$= number of misplaced tiles.</p>	5	BMC021.2	K3
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Section: C

Q. No.	Questions	Marks	CO	BL
a)	<p>For each of the following agents, develop PEAS description of task environment:</p> <ol style="list-style-type: none"> Mathematician Theorem proving assistance Satellite image analysis system Internet book shopping agent. Medical diagnosis system 	10	BMC021.1	K2
b)	<p>In the context of this intelligent traffic management system, explain what an intelligent agent is and identify the key components that such an agent would require to effectively manage traffic in real time. Evaluate PEAS.</p>	10	BMC021.1	K2

Q. No.	Questions	Marks	CO	BL
a)	<p>Consider the following graph:</p> 	10	BMC021.2	K3