

Programme Name & Branch	:	B.Tech Computer Science and Engineering	
Course Code and Course Name	:	BCSE306L - Artificial Intelligence	
Faculty Name(s)	:	Prof. Anbarasa Kumar A, Prof. Nivedita S	
Class Number(s)	:	VL2026270102520, VL2026270102517	
Date of Examination	:	28.09.2026	
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:
CO2: Apply basic principles of AI in solutions that require problem-solving, inference, perception, knowledge representation and learning.
CO3: Demonstrate knowledge of reasoning, uncertainty, and knowledge representation for solving real-world problems

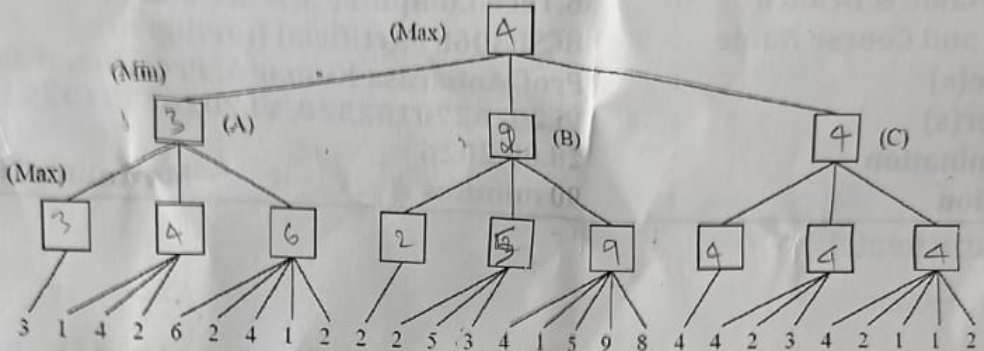
Q. No	Question	M	CO																		
1.	A warehouse robot must rearrange bins placed on a 3x3 rack from the given Start Arrangement to the Target Arrangement shown below. Robot may slide any bin that is adjacent to the empty cell. Heuristics will number of misplaced bins with respect to the target. Start Arrangement (h = 2) <table border="1"><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>4</td><td></td><td>6</td></tr><tr><td>7</td><td>5</td><td>8</td></tr></table> Target Arrangement <table border="1"><tr><td>1</td><td>2</td><td>3</td></tr><tr><td>4</td><td>5</td><td>6</td></tr><tr><td>7</td><td>8</td><td></td></tr></table> Apply the Steepest-Ascent Hill Climbing algorithm, explain every step.	1	2	3	4		6	7	5	8	1	2	3	4	5	6	7	8		10	CO2
1	2	3																			
4		6																			
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1	2	3																			
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2.	Consider the following game tree with Max Player takes first move. The leaf nodes contains the projected utility values if the Min-Max Players chosen the best moves always. In this context, answer the following: - Apply Mini-Max search procedure and find the best possible value for each node in the game tree.(2 marks) - What would be the best possible option for Max Player in terms of A, B, or C and what is its value?(3 marks) - Applying the alpha-beta procedure will optimize Min-Max search procedure by pruning some branches in the game tree. So, find the nodes/branches to be pruned, if possible. [NOTE: Represent the updated alpha-beta values clearly while applying algorithm](5 marks)	10	CO2																		



VIT

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SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2026-2027



3.

- A university IT department is defining access control policies for its high-performance computing labs using the following three statements:
1. Every Computer Science student has access to at least one research server.
 2. No student can access a server unless that server has active security clearance.
 3. Alex is a Computer Science student, but Alex cannot access Server-01.
- a) Define appropriate predicates, constants, and quantifiers, then translate Statements 1, 2, and 3 into First-Order Logic (FOL). (3 marks)
- b) Explain why Propositional Logic is insufficient to model the above scenario. (1 mark)
- c) Prove whether Server-01 has active security clearance through appropriate inference rules. (6 marks)

10

4.

- A veterinary clinic's knowledge base contains the following statements about pet health:
1. All vaccinated dogs are healthy.
 2. Any dog that is walked daily and is not sick becomes vaccinated.
 3. The dog Buddy is walked daily and is not sick.
- Goal to be proved: Buddy is healthy. Prove by Resolution.

10

5.

- XYZ Corp's internal cybersecurity monitoring system works as follows. Whenever an employee opens an email attachment from an unknown sender while their antivirus software has not been updated, that employee's system is automatically flagged as being at risk; and whenever an employee's system is flagged as being at risk, the company's IT security team is immediately sent an alert. On a recent Tuesday morning, an employee named Kavya opened an email attachment from an unknown sender, and at that time her antivirus software had not been updated. Goal: An alert is sent to Kavya.
- a) Apply Forward Chaining. (5 Marks)
 - b) Apply Backward Chaining. (5 Marks)

10
