



CBCS SCHEME - Make-Up Exam

BAD402

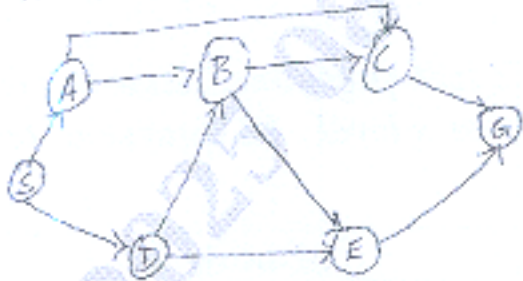
Fourth Semester B.E/B.Tech. Degree Examination, June/July 2025 Artificial Intelligence

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1					
			M	L	C
1	a.	Define Artificial Intelligence (AI). Explain the historical development of AI.	10	L2	CO1
	b.	Explore the relationship between rationality and decision making in AI systems.	10	L2	CO1
OR					
2	a.	Define Intelligent agents and explain PEAS specification of intelligent agents.	10	L1 L2	CO2
	b.	Differentiate between simple reflex agents, model-based agents, goal based agents and utility based agents.	10	L2	CO2
Module – 2					
3	a.	Explain in detail step by step illustration of how breadth first search works.	10	L2	CO1
	b.	Define five components of a problem. Write a complete state space for a vacuum cleaner to clean 2 squares P and Q. Q is to the right of P.	10	L3	CO2
OR					
4	a.	Explain the key principles of depth-first search as an uninformed search strategy.	10	L2	CO1
	b.	Define DFS. Write the DFS with pruning for this graph with source node = 8 and goal = 3. Full steps to be written for full marks.	10	L3	CO2
<pre> graph TD 8((8)) --- 5((5)) 8 --- 4((4)) 5 --- 9((9)) 5 --- 7((7)) 7 --- 1((1)) 7 --- 12((12)) 12 --- 2((2)) 4 --- 11((11)) 11 --- 3((3)) </pre> <p>Fig. Q4 (b)</p>					
Module – 3					
5	a.	Explain the role of heuristics in informed search strategies. How do heuristics contribute to finding optimal solutions?	10	L2	CO1

	b.	Explain the A* search algorithm, emphasizing the role of heuristic functions in its operation.	10	L2	CO1
OR					
6	a.	Apply the Greedy best first search to find the solution path from S to G. Write all steps as well as open and closed lists for full marks. S(h = 7), A(h = 9), B(h = 4), C(h = 2), D(h = 5), E(h = 3), G(h = 0)	10	L3	CO2
		 <p>Fig. Q6 (a)</p>			
	b.	Describe the Wumpus World environment and its significance in AI. What challenges does the Wumpus world pose for intelligent agents.	10	L2	CO1
Module – 4					
7	a.	Compare and contrast propositional inference with first order logic inference. What additional capabilities does FOL inference offer?	10	L4	CO3
	b.	Explain various ambiguities in Natural Language Processing with examples and summarize in the form of a table about formal languages and their ontological and epistemological commitments.	10	L3	CO2
OR					
8	a.	“Everyone who loves all animals is loved by someone”. Illustrate the procedure by translating the sentence in the form of First order resolution.	10	L4	CO3
	b.	Write the algorithm for backward chaining and prove Tree for finding criminal (waste) using backward chaining.	10	L3	CO2
Module – 5					
9	a.	Write the representation of Bayes Theorem. In a class, 70% children were full sick due to viral fever and 30% due to Bacterial fever. The probability of observing temperature for viral is 0.78 and for Bacterial is 0.31. If a child develops high temperature, find the child’s probability of having viral infection.	10	L3	CO2
	b.	Explain the concept of full joint distributions in the context of uncertain knowledge. How does it represent the relationships between variables?	10	L2	CO2
OR					
10	a.	Explain marginalization and normalization with a full joint distribution of (toothache, catch, cavity).	10	L2	CO1
	b.	Explain ES (Expert System) shell that simplify the process of creating a knowledge base of Expert System.	10	L2	CO1
