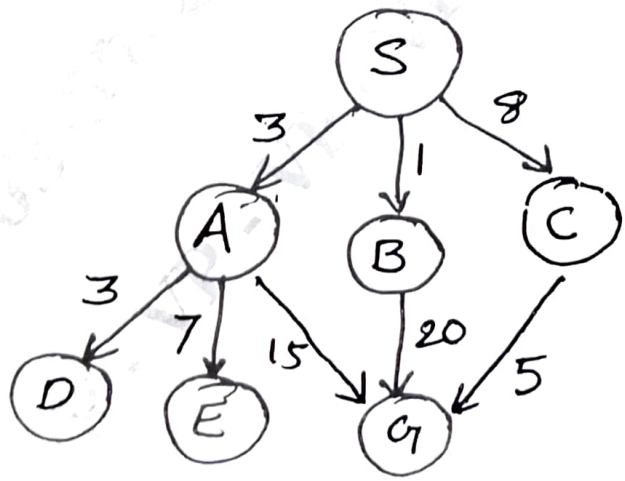
CBCS SCHEME

USN | 4 | K | | | | | | | | | | 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.	What are the four components to define a problem? Define them.	4	L1	CO1
	b.	Compare and contrast human intelligence to artificial intelligence with numerous examples and applications.	7	L4	CO1
	c.	Explain the following : i) PEAS ii) Simple reflex agent iii) Model based agent.	9	L2	CO1
		OR			
2	a.	What is AI? List out the applications of AI, state the characteristics of AI problem.	8	L1	CO1
	b.	Analyse and generalize what is a rational agent.	6	L4	CO1
	c.	Explain the structure of agents and analyse the characteristics of intelligent agents.	6	L2	CO1
		Module – 2			
3	a.	You are given two jugs, a 5 liters one and a 4 liters one, A pump which has unlimited water which you can use to fill the jug, and the ground on which water may be poured. Neither jug has any measuring markings on it. How can you get exactly 2 (two) liters of water in the 5(five) liters of jug? Unit : Apply water Jug problem algorithm.	10	L3	CO2
	b.	Describe Depth First Search (DFS) search algorithm with an example.	10	L2	CO2
		OR			
4	a.	Explain Breadth First Search (BFS) algorithm and apply BFS to find the solution for the above graph. Also find the optimum path and cost for the above graph.  Fig.Q4(a)	10	L3	CO2
	b.	Describe the iterative deepening depth first search with an example.	10	L2	CO2

		Module – 3			
5	a.	Compare blind search and heuristic search algorithm in detail.	6	L4	CO3
	b.	Write a note on Wumpus world problem.	6	L2	CO3
	c.	Write the connectives used to form complex sentence of propositional logic. Given example for each.	8	L2	CO3
		OR			
6	a.	Describe A* search algorithm with an example.	10	L3	CO3
	b.	Compare proposition logic and predicate logic in detail with example.	4	L4	CO3
	c.	Explain the following concepts with example : i) Heuristic function ii) Atomic sentence iii) Complex sentence.	6	L2	CO3
		Module – 4			
7	a.	What are predicates? Explain its syntax and semantics.	5	L2	CO4
	b.	Define universal and existential instantiation and give example for both.	5	L1	CO4
	c.	Consider the following knowledge base : i) Gita likes all kinds of food ii) Mango and chapatti and food iii) Gita eats almond and is still alive iv) Anything eaten by anyone and is still alive is food Goal : Gita likes almond.	10	L3	CO4
		OR			
8	a.	Write appropriate quantifiers for the following : i) Some students read well ii) Some students like some books iii) Some students like all books iv) All students like some books v) All students like no books Explain the concept of resolution in first order logic with appropriate procedure.	8	L3	CO4
	b.	Write and explain simple backward – chaining algorithm and forward – chaining algorithm for first – order knowledge bases with example. Also, explain the process of unification.	12	L3	CO4
		Module – 5			
9	a.	Explain the impact of uncertainty in probabilistic reasoning.	5	L2	CO5
	b.	Explain Bayes' rule and its utilization in probabilistic reasoning.	5	L2	CO5
	c.	Write the representation of Bayes Theorem. In a class, 70% children were fall sick due to viral fever and 30% due to bacterial fever. The probability of observing temperature for viral is 0.78 and bacterial is 0.31. If a child develops high.	10	L3	CO5
		OR			
10	a.	Write short notes on : i) Expert systems ii) Knowledge acquisition.	8	L2	CO5
	b.	Suppose a doctor is trying to find out if a patient is suffering from some type of cancer. If the cancer is only found on average in 2 out of every, 1000 people, the doctor's initial beliefs can be expressed as P(cancer) = 0.002. There is a laboratory test to determine if the patient has cancer. Unfortunately this test is 100 % accurate. The test comes back positive in 98% of cases where the patient has cancer. Also, the test comes out negative only in 97% of the cases, where the patient does not have a cancer. If the doctor orders a test, and it comes back positive what is the probability that the patient indeed has cancer?	12	L3	CO5

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