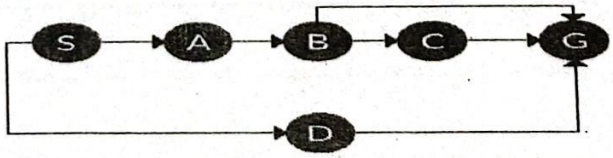
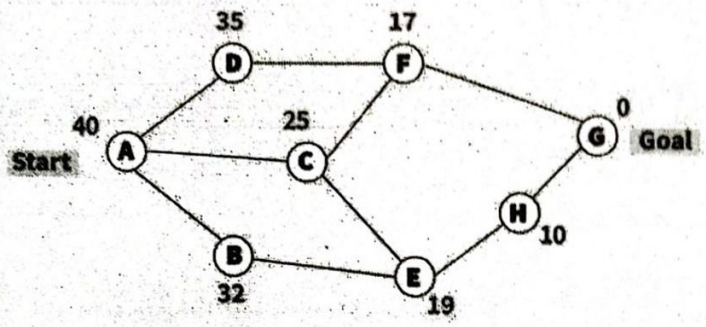
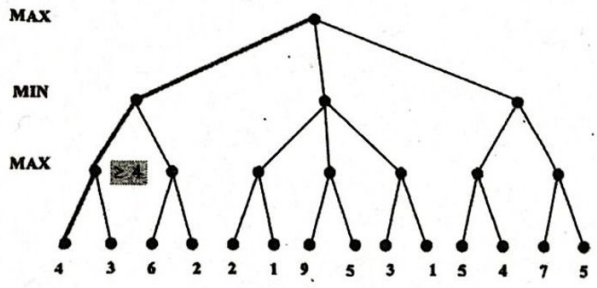
SL No.	Part B-Test Questions	M	BT	CO
1.a	Explain Model-based reflex agents and Goal-based agents with pseudocodes and diagrams.	10	L2	CO2
2.a	Discuss the three ways to represent the states and transition between them	5	L2	CO1
2.b	Consider the graph below.  	5	L3	CO4
	Draw the equivalent search tree and find out which solution would BFS find to move from node S to node G if run on the graph below?			
3.a	List the properties of task environments.	5	L1	CO2
3.b	Illustrate the greedy best first search for the following problem:  A represents the start state and G represents goal state.	5	L3	CO3
4.a	With a neat diagram, describe the conceptual components of a learning agent.	6	L2	CO1
4.b	Demonstrate the node consistency and arc consistency with suitable examples.	4	L3	CO4
5.	Perform the alpha-beta pruning for the below tree. Demonstrate the step-by-step result.  	10	L3	CO3

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Academic year 2023-2024 (Odd Sem)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING/ INFORMATION SCIENCE AND ENGINEERING

Date	30/4/2024	Maximum Marks	10+50
Course Code	22MCEA1T	Duration	120min
Sem	I	CIE II	

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Q. No.	Questions	M	BT	CO
	PART A			
1.1	List the assumptions made in order specify a learning problem for the BRUTE-FORCE MAP LEARNING algorithm	2	2	1
1.2	Write LIST-THEN-ELIMINATE algorithm.	2	2	2
1.3	Define concept learning.	1	1	1
1.4	Amy has two bags. Bag I has 7 red and 4 blue balls and bag II has 5 red and 9 blue balls. Amy draws a ball at random and it turns out to be red. Determine the probability that the ball was from the bag I.	2	3	2
1.5	The Inductive bias of CANDIDATE-ELIMINATION algorithm states that the ……	1	1	1
1.6	List any four appropriate problems for decision tree learning	2	1	2
	PART B			
2	Consider the given dataset, Apply Naïve Baye's Algorithm and Predict fruit has the following properties then which type of the fruit it is Fruit = {Yellow, Sweet, Long} **Frequency Table:**	10	4	4
3	Discuss the Minimum description length principle and Maximum likelihood Estimation methods with suitable examples.	10	2	3
4	Construct the final design for a checkers learning problem by indicating the steps used in a learning system	10	2	2
5	Discuss Find-S algorithm and consider the dataset given and answer the following questions. a) How many concepts are possible for this instance space? b) How many hypotheses can be expressed by the hypothesis language? c) Apply Find-S algorithm	10	3	4

Fruit	Yellow	Sweet	Long	Total
Mango	350	450	0	650
Banana	400	300	350	400
Others	50	100	50	150
Total	800	850	400	1200

EXAMPLE	COLOR	TOUGHNESS	FUNGUS	APPEARANCE	POISONOUS
1.	GREEN	HARD	NO	WRINKELD	YES
2.	GREEN	HARD	YES	SMOOTH	NO
3.	BROWN	SOFT	NO	WRINKLED	NO
4.	ORANGE	HARD	NO	WRINKLED	YES
5.	GREEN	SOFT	YES	SMOOTH	YES
6.	GREEN	HARD	YES	WRINKLED	YES
7.	ORANGE	HARD	NO	WRINKLED	YES

6	Construct a decision tree for the following dataset. Use the concept of Entropy and Information gain to find the best attribute for split.	**10**	**3**	**3**

Patient ID#	Sore Throat	Fever	Swollen Glands	Congestion	Headache	Diagnosis
1	Yes	Yes	Yes	Yes	Yes	Strep throat
2	No	No	No	Yes	Yes	Allergy
3	Yes	Yes	No	Yes	No	Cold
4	Yes	No	Yes	No	No	Strep throat
5	No	Yes	No	Yes	No	Cold
6	No	No	No	Yes	No	Allergy
7	No	No	Yes	No	No	Strep throat
8	Yes	No	No	Yes	Yes	Allergy
9	No	Yes	No	Yes	Yes	Cold
10	Yes	Yes	No	Yes	Yes	Cold

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Academic year 2023-2024 (Odd Semester)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Date	14 May 2024	Maximum Marks	10+50
Course Code	22MCE1A1T	Duration	120 Min
Sem	I	CIE - III	

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

SL No	Part A- Quiz	M	BT	CO
1.1	Define Bayesian Belief network?	1	L2	CO1
1.2	Give the concept of k – nearest neighbour in Machine learning?	2	L2	CO2
1.3	Give the concept of PAC learnability	2	L2	CO2
1.4	Define EM Algorithm?	2	L1	CO1
1.5	Define VC dimension?	2	L1	CO1
1.6	Represent Mistake bound Model?	1	L2	CO1

SL No	Part B -Test	M	BT	CO
2	Illustrate with an example, EM Algorithm?	10	L3	CO2
3	Define Reinforcement Learning. Illustrate learning task and analyze how learning problem in Reinforcement learning differs from other function approximation tasks?	10	L4	CO3
4	Infer how an agent learns optimal policy using Q-learning? Discuss Q-learning Algorithm in detail	10	L4	CO4
5	Interpret the representation and inference in Bayesian belief networks with suitable example	10	L3	CO2
6	Illustrate the concept of temporal- difference learning and explain non deterministic rewards and actions in Q-learning.	10	L3	CO3

Course Outcomes: After completing the course, the students will be able to: -	
CO 1	Explore the fundamentals of Artificial intelligence technology and Machine learning algorithms
CO 2	Apply the working of various searching algorithms, games, pruning, inferencing, etc. with suitable examples.
CO 3	Analyze and determine appropriate algorithms and techniques for AI and ML applications.
CO 4	Evaluate AI and ML based solutions for classical problems

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

	Particulars		CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
Marks Distribution	Test	Max Marks	06	24	20	10	4	6	30	20	-	-