ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

NAME OF THE BRANCH
VII Semester
IT5701- ARTIFICIAL INTELLIGENCE
(Regulation2019)

Time:3hrs   Max.Marks: 100

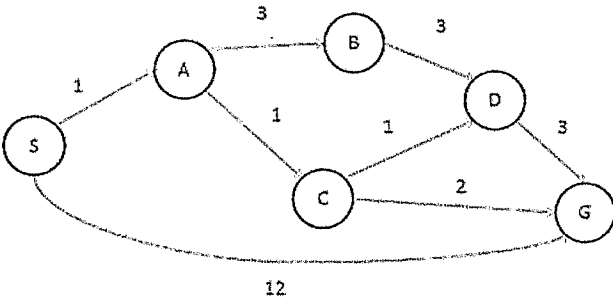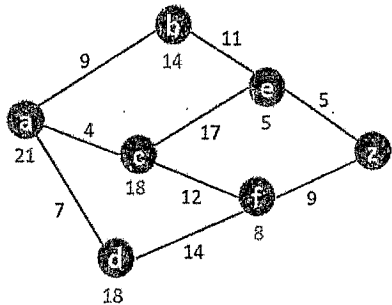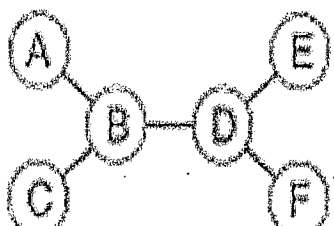| CO1	Understand the search techniques.
CO2	Apply the search techniques to real-time problems.
CO3	Apply the reasoning techniques to real world problems.
CO4	Understand the representation of knowledge.
CO5	Understand the learning techniques.

BL – Bloom's Taxonomy Levels
(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)
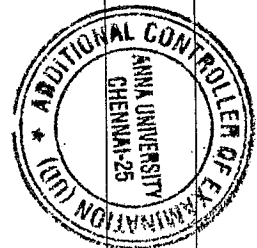(Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	Define the Rationality, Omniscience, Perfection of an AI agent.	2	1	L1
2	Give the descriptions of variables, domain and constraints of a 9x9 SUDOKO game.	2	1	L2
3	State the relationship between entailment, logical inference and model checking in propositional logic.	2	2	L2
4	State the difference between informed & unformed search methods and give suitable examples for each method.	2	2	L2
5	List the issues to be considered in knowledge representation.	2	4	L1
6	Tabulate the advantages and disadvantages in Sematic network and Frame Representation of knowledge.	2	4	L2
7	Give suitable example sequences of partial ordered plan and total ordered plan and write the steps in SATPlan.	2	3	L2
8	Narrate the morphological, syntax, semantics and pragmatic concepts of Linguistics for Natural Language Processing.	2	3	L2
9	In a logical learning method, what are true positive, true negative, false positive and false negative examples of a hypothesis.	2	5	L2
10	Draw an architecture diagram of a conversational AI chatbot	2	5	L2

Q.No.	Questions	Marks	CO	BL
11 (a)	i) Explain the below given agent task environments with suitable examples. • Fully observable Vs Partially Observable • Single agent Vs Multi-agent • Deterministic Vs Stochastic • Episodic Vs Sequential • Static Vs Dynamic • Discrete Vs Continuous ii) Find the Shortest path from S to G of the below given graph using Uniform cost search method. 	8 5	1 2	L3 L3
	OR			
11 (b)	i) Find the shortest path from A to Z of the below given graph using A* algorithm. ii) Write the algorithm for solving tree structured CSPs and apply the same to color the below given nodes. Consider a maximum of 3 colors for your coloring. 	8 5	1 2	L3 L3

12 (a)	For a Wumpus world agent, formulate/devise the following. • Propositional Logic Sentences of facts and rules • Truth Table for inference • Algorithm for inference by enumeration	**13**	<u>3</u>	<u>L3</u>
	OR			
12 (b)	Consider the below given knowledge and apply FOL inference Resolution to prove that "John likes peanuts". John likes all kind of food. Apple and vegetable are food Anything anyone eats and not killed is food. Anil eats peanuts and still alive Harry eats everything that Anil eats.	**13**	<u>3</u>	<u>L3</u>
13 (a)	Consider the below given narration of knowledge "Every human, animal and bird is living thing who breathe and eat. All birds can fly. All man and woman are humans who have two legs. Cat is an animal and has a fur. All animals have skin and can move. Giraffe is an animal who is tall and has long legs. Parrot is a bird and is green in color". Show the representations in • Predicate logic • Semantic network • Frames	**13**	<u>4</u>	<u>L3</u>
	OR			
13 (b)	Explain the below given Semantic Web Technologies of knowledge representation with suitable examples. • Structured web documents (XML) • Resource Description Framework (RDF) • Web ontology language (OWL) • Rule Languages	**13**	<u>4</u>	<u>L3</u>

14 (a)	Formulate and explain the planning graph for the following problem scenario.
	
	Start: Have(Cake)
	Finish: Have(Cake) ∧ Eaten(Cake)
	
	Op(ACTION Eat(Cake),
	    PRECOND Have(Cake),
	    EFFECT Eaten(Cake) ∧ ¬Have(Cake))
	
	Op(ACTION Bake(Cake),
	    PRECOND ¬Have(Cake),
	    EFFECT: Have(Cake))
		13	<u>5</u>	<u>L3</u>

	OR			
14 (b)	Discuss about the following with respect to Natural Language processing (NLP). • Machine learning models • Evaluation metrics • Descriptive and inferential statistics	13	5	L3
15 (a)	Explain the below given learning approaches with suitable examples. • Explanation based Learning • Current–best hypothesis search • Inductive logic programming • Reinforcement learning	13	5	L4
	OR			
15 (b)	Narrate about the types of chatbots with suitable examples and discuss about any 10 chatbot development platforms/Frameworks.	13	5	L4

PART- C(1x 15=15Marks)
(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	For the below given example of knowledge, Apply Forward and Backward chaining to prove that "Colonel West is a criminal". • The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American. Among the Inference mechanisms of Forward and Backward chaining, which of the mechanism you considered to be more suitable for above narration of knowledge? Justify.	15	3	L5