Q. Code:979101

Reg. No. | | | | | | | | | | | | | |

M.E / M.TECH. DEGREE EXAMINATIONS, MAY 2024

Second Semester

IR22205 – ARTIFICIAL INTELLIGENCE IN INDUSTRIAL AUTOMATION

(Mechanical Engineering)

(Regulation 2022)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Students will understand of the history of artificial intelligence (AI) and its foundations.	**2**
CO 2	Students will apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.	**3**
CO 3	Students will be able to demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.	**3**
CO 4	Students will develop applications in an 'AI language', expert system shell, or data mining tool.	**3**
CO 5	Students will be able to demonstrate proficiency in applying scientific method to models of machine learning	**3**

PART- A (20 x 2 = 40 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	List down the characteristics of intelligent agent.	**1**	**2**
2.	Compare, Machine Learning concepts and Deep Learning Concepts.	**1**	**2**
3.	What is the structure of an agent?	**1**	**2**
4.	How does a Simple Reflex Agent work?	**1**	**2**
5.	How will you measure the problem-solving performance?	**2**	**3**
6.	When a heuristic function h is said to be admissible? Give an admissible heuristic function for Travelling Salesman Problem?	**2**	**3**
7.	Compare Informed & Uninformed search with examples.	**2**	**3**

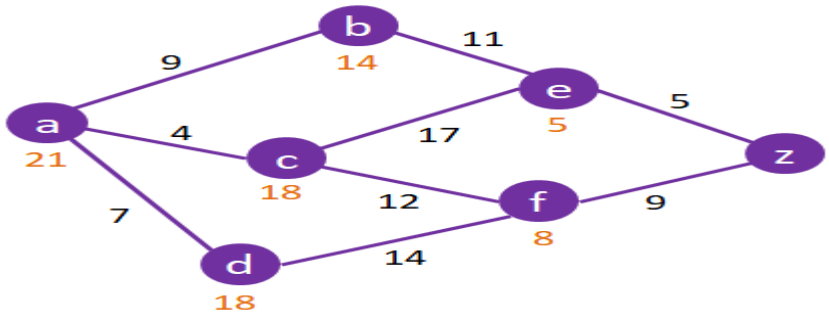
8.	Differentiate Blind Search and Heuristic Search.	**2**	**2**
9.	Explain the ways in which one can understand the semantics of a belief network?	**3**	**3**
10.	Differentiate syntax and semantic analysis in NLP terminologies.	**3**	**3**
11.	Explain how information retrieval process works in memory organization systems.	**3**	**3**
12.	Explain the working of fuzzy matching used in matching techniques.	**3**	**3**
13.	Provide examples of situations where non-monotonic reasoning applies.	**4**	**3**
14.	Differentiate fuzzification and defuzzification.	**4**	**3**
15.	State in your own words about conditional probability.	**4**	**2**
16.	Identify and describe different types of learning methods in artificial intelligence.	**4**	**3**
17.	List and briefly describe two applications of neural networks, showcasing how they apply to solving real-world problems	**5**	**3**
18.	Show what is Reward Function in Reinforcement learning?	**5**	**3**
19.	What are the limitations in using propositional logic to represent the knowledge base?	**5**	**2**
20.	State the support vector in SVM.	**5**	**2**

PART- B (5 x 10 = 50 Marks)

		Marks	CO	RBT LEVEL
21. (a)	What are the different types of agents in artificial intelligence, and how do goal-driven, utility-driven, and learning agents differ from each other?	**(10)**	**1**	**2**
	(OR)			
(b)	What are some common programming techniques used in Artificial Intelligence, and how do they contribute to solving various problems within	**(10)**	**1**	**2**

the field?

22. (a)	Utilizing a 3x3 board with 9 block spaces, where 8 blocks contain tiles numbered from 1 to 8 and one space is left blank, the objective is to rearrange the tiles into a specific sequence to achieve the goal state. How would you solve this problem using Breadth-First Search (BFS) and Depth-First Search (DFS) algorithms?	**(10)**	**2**	**3**
	(OR)			
(b)	Can you explain what the A* search algorithm for the given problem where starting state is 'a' and goal state is 'z'.	**(10)**	**2**	**3**



23. (a)	What methods are commonly employed for indexing and retrieval in memory organization systems, and how does the integration of knowledge enhance their functionality?	**(10)**	**3**	**3**
	(OR)			
(b)	Explain in details about Bayesian Networks and Certainty Factors.	**(10)**	**3**	**3**
24. (a)	Write a note on fuzzy logic. How does it used for probabilistic reasoning.	**(10)**	**4**	**3**
	(OR)			
(b)	Implement the candidate elimination algorithm for version spaces for car concept with several features and demonstrate learning by presenting positive and negative examples of the concept.	**(10)**	**4**	**3**
25. (a)	What is the K-nearest neighbors algorithm, and how does it work in the context of machine learning and pattern recognition?	**(10)**	**5**	**3**
	(OR)			
(b)	Convert the following sentences to wff in first order predicate	**(10)**	**5**	**3**

logic.

(i) No coat is water proof unless it has been specially treated.

(ii) A drunker is enemy of himself.

(iii)Any teacher is better than a lawyer.

(iv)If x and y are both greater than zero, so is the product of x and y.

(v) Everyone in the purchasing department over 30 years is married.

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	What are the advantages and limitations of Genetic Algorithms, and could you provide an overview of the taxonomy of crossover operators used in such algorithms?	**(10)**	**4**	**3**

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