Reg. No.															

Question Paper Code	13538

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Fourth Semester

Artificial Intelligence and Data Science

(Common to Computer Science and Engineering (AIML))

20AIPC401 – FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

Regulations - 2020

Duration: 3 Hours Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which of the following best defines Artificial Intelligence? (a) Programming with logic only (b) Making computers intelligent like humans (c) Automating repetitive tasks (d) Replacing hardware with software	1	K1	CO1
2.	In AI, what does the term "agent" refer to? (a) A part of the compiler (b) A file system component (c) Anything that can perceive its environment and act upon it (d) A network module	1	K1	CO1
3.	What distinguishes informed search from uninformed search? (a) Informed search uses heuristic functions (b) Informed search uses more memory (c) Informed search explores all nodes (d) Informed search is always faster	1	K2	CO2
4.	If a node violates a constraint in CSP, what does constraint propagation do? (a) Ignores the violation (b) Backtracks to the first node (c) Removes inconsistent values from neighboring domains (d) Chooses another random node	1	K2	CO2
5.	Which of the following is a valid example of a First-Order Predicate Logic sentence? (a) $\forall x$ (Human(x) $\rightarrow$ Mortal(x)) (b) $p \vee q$ (c) $(x + 2 = 5)$ (d) True	1	K3	CO3
6.	Which of the following is an example of a declarative representation in AI? (a) A list of actions to be performed sequentially (b) A series of steps to solve a problem. (c) A set of facts and rules in predicate logic (d) An algorithm for decision-making.	1	K2	CO3
7.	Which of the following is an example of an object in Ontological Engineering? (a) Animal (b) Human (c) Dog (d) Mammal	1	K1	CO4
8.	Which of the following is a reasoning technique used in systems for categories? (a) Inductive reasoning (b) Random sampling (c) Regression analysis (d) Quantum computing	1	K1	CO4
9.	In a simple planning agent, which of the following is the first step? (a) Execute the plan (b) Observe the environment (c) Formulate a goal (d) Evaluate the success of the plan.	1	K1	CO5
10.	Which of the following models is widely used for natural language processing tasks such as machine translation and question answering? (a) K-means clustering (b) GPT-3 (c) Decision trees (d) Linear regression	1	K2	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Mention any two characteristics of intelligent agents.	2	K2	CO1
12.	Discuss the common technique used in AI problem solving.	2	K2	CO1

13.	Differentiate uninformed and informed search strategies.	2	K2	CO2
14.	Write down the stopping criteria in Hill Climbing.	2	K2	CO2
15.	Given a simple problem, apply First-Order Predicate Logic to represent a statement, such as "All humans are mortal" using predicates and quantifiers.	2	K3	CO3
16.	Apply the resolution rule to solve a simple logical expression or problem, such as proving a given formula is a tautology.	2	K3	CO3
17.	Given a real-world scenario, apply Ontological Engineering to represent key entities and relationships in an ontology. For example, represent objects and categories in a library management system.	2	K3	CO4
18.	State the role of Reasoning with Default Information in AI decision-making.	2	K2	CO4
19.	Write STRIPS language for representing the planning problems.	2	K2	CO5
20.	Differentiate Progression and Regression.	2	K2	CO5
21.	List out the various types of locomotions.	2	K2	CO6
22.	Describe the six-legged robot with diagram and AFSM for single leg robot.	2	K2	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a) (i)	Describe the significance of AI in today's technological landscape.	6	K2	CO1
	(ii)	Explain the relationship between AI and cognitive science.	5	K2	CO1
		OR			
	b) (i)	Explain in detail about the different types of Intelligent Agent with a neat diagram.	6	K2	CO1
	(ii)	Explain in detail about the Properties of task Environment and approaches of AI with an example.	5	K2	CO1
24.	a)	Apply a search strategy to solve a given problem using either BFS or DFS. Which one would be more effective for the problem described, and why?	11	K3	CO2
		OR			
	b)	Apply a backtracking algorithm to solve a simple CSP, such as the N-Queens problem, and explain each step of the process.	11	K3	CO2
25.	a)	Explain forward and backward chaining with an example.	11	K2	CO3
		OR			
	b)	Discuss the steps involved in the Knowledge Engineering process and outline the concept of Semantic Networks in detail.	11	K2	CO3
26.	a)	Summarize in detail about ontological engineering and write categories of objects with examples.	11	K2	CO4
		OR			
	b)	Analyze the impact of reasoning systems for categories in complex systems like healthcare or legal expert systems. What challenges arise when categories overlap or when new categories need to be added?	11	K3	CO4
27.	a)	Explain the logic with step in Goal stack problem.	11	K2	CO5
		OR			
	b)	Explain the effectiveness of Conditional Planning in dynamic, uncertain environments like stock trading or real-time strategy games.	11	K2	CO5

28. a) Design a system that extracts key information from medical research papers, such as findings, authors, and publication dates. What steps would you take to ensure the system's accuracy? *11* *K3* *CO6*

OR

b) Demonstrate the model of ROBOT with its hardware and perception in detail with neat diagram. *11* *K3* *CO6*