Graphic Era
HILL UNIVERSITY
Established as an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 02 of 2011)
University under section 2(f) of UGC Act, 1956

Term Evaluation Semester ▒▒▒ Examination Nov 2025

Roll No..........................

Name of the Program: B.Tech CSE
Semester: 3rd

Name of the Course: Fundamentals of Artificial Intelligence and
Machine Learning

Course Code: TCS-364

Time: 1:30 Hours
MM: 50

Note:

(i)   Answer all the questions by choosing any one of the sub questions.

(ii)   Each question carries 10 marks

Q.1		(10 Marks)	
a.	Discuss the architecture and environments of intelligent agents. Explain the different types of agents and their respective roles in problem-solving.		CO 1
	OR		
b.	Describe the problem-solving frameworks in AI and elaborate different approaches used for searching strategies in artificial intelligence.		
Q.2		(10 Marks)	
a.	What is heuristic search? Explain how heuristics improve search efficiency. Illustrate with the 8-puzzle problem.		CO 1
	OR		
b.	Write detailed notes on applications and impacts of AI in healthcare, finance, and education sectors using real world examples.		
Q.3		(10 Marks)	
a.	Illustrate the process of building a knowledge base for an expert system, including inference in first-order logic		CO 2
	OR		
b.	Discuss the concept of uncertainty in reasoning. Explain Bayesian networks and their role in probabilistic reasoning.		
Q.4		(10 Marks)	
a.	Let the predicate $P(x)$ be defined as "x is a prime number". Given the domain $D = \{2,3,4,5,6,7,8,9\}$, evaluate the following logical expressions: a) $\forall x\, P(x)$ b) $\exists x\, P(x)$ c) $\forall x\, (P(x) \rightarrow x > 1)$ d) $\exists x\, (P(x) \wedge x = 6)$		CO 2
	OR		
b.	Define knowledge-based systems. Explain how propositional logic and predicate logic are used to represent knowledge.		
Q.5		(10 Marks)	
a.	Compare breadth-first search, depth-first search, and A* search algorithms with examples		CO 1, CO 2
	OR		
b.	Write short note on with respect to knowledge representation in AI 1. Conditional statements 2. Quantifiers 3. Implications		