Name:

Enrolment No:

UPES

End Semester Examination, December 2024

Course: Eléments of AIML **Semester : III**

Program: B.Tech (CSE)+BCA **Time : 03 hrs.**

Course Code: CSAI2015 **Max. Marks : 100**

Nos. of page(s) : 02

Instructions: Kindly attempt according to the provided time and given weightage.

SECTION A

(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Explain any two advantages and limitations of Artificial Intelligence.	**4**	**CO1**
Q 2	What is the unification algorithm in predicate logic, and why is it important for AI?	**4**	**CO2**
Q 3	Outline the importance of dividing datasets into training, testing, and validation sets in Machine Learning.	**4**	**CO3**
Q 4	Differentiate between supervised and unsupervised learning.	**4**	**CO3**
Q 5	List and explain two applications of Machine Learning in the healthcare industry.	**4**	**CO4**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Explain the differences between propositional logic and predicate logic with suitable examples. **Or** Write the following statements in predicate logic, and then negate them: i. "Every student in the class has submitted the assignment." ii. "There exists a book that is not on the reading list."	**10**	**CO2**
Q 7	Describe the concept of cross-validation and its importance in ensuring the reliability of Machine Learning models.	**10**	**CO3**
Q 8	For a dataset with points (1,2), (2,3), (3,5), (4,7) calculate the linear regression coefficients m (slope) and b (intercept) for the line $y = mx + b$ using the formulas: $$m = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2}$$ $$b = \frac{\sum y - m(\sum x)}{n}$$	**10**	**CO3**
Q 9	Describe the impact of AI in the banking industry and how it is used to enhance security and fraud detection.	**10**	**CO4**

SECTION-C (2Qx20M=40 Marks)			
Q 10	Define artificial intelligence and discuss its techniques, levels of models, and criteria for success. Use examples to illustrate the applications and limitations of AI in real-world scenarios. **OR** Prove the following statements using resolution in predicate logic: Statements: 1. All humans are mortal. 2. Socrates is a human. Conclusion: Therefore, Socrates is mortal. Use predicate logic and the resolution principle to derive the conclusion.	**20**	**CO1** **CO2**
Q 11	Describe the major types of machine learning: supervised, unsupervised, semi-supervised, and reinforcement learning. Include a detailed comparison of each type and provide real life examples.	**20**	**CO3**