

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZINAGARAM
III B. Tech I Semester Supplementary Examinations November -2025
INTRODUCTION TO ARTIFICIAL INTELLIGENCE & MACHINE LEARNING
(MECHANICAL ENGINEERING)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

		<u>UNIT-I</u>	
1.	a)	Emulate an XOR gate using a perceptron.	[7M]
	b)	Explain the role of a genetic algorithm in AI.	[7M]
		(OR)	
2.	a)	Write the backpropagation algorithm and explain how the weights are adjusted.	[7M]
	b)	Run the above algorithm to recognize the alphabet 'A'.	[7M]
		<u>UNIT-II</u>	
3.	a)	When do you use forward and backward reasoning? For medical diagnosis, which of these will you use? Justify.	[7M]
	b)		[7M]
		(OR)	
4.	a)	For mechanical maintenance of automobiles, which reasoning technique is used? Why? Give an example, to support your answer.	[7M]
	b)	Is ChatGPT a knowledge based agent? Justify your answer.	[7M]
		<u>UNIT-III</u>	
5.	a)	State and prove Bayes' Theorem. How is it related to Certainty factor?	[7M]
	b)	Distinguish between supervised and unsupervised learning.	[7M]
		(OR)	
6.	a)	How does a Naïve Bayes classifier function? Give example.	[7M]
	b)	How does a Gibbs algorithm function, relative to the EM algorithm? Take an example.	[7M]
		<u>UNIT-IV</u>	
7.	a)	How suitable is the K-means algorithm for clustering engines based on their size? Justify.	[7M]
	b)	Huge data is the problem of the day. How do you reduce the size of such data and identify the important/useful data?	[7M]
		(OR)	
8.	a)	Write and explain the PCA algorithm.	[7M]
	b)	What is the function of Eigen vectors and eigen values? Explain.	[7M]
		<u>UNIT-V</u>	
9.	a)	Compare and contrast Bagging and Boosting techniques, including applications.	[7M]
	b)	Write a short note on Deep fake and Deep Seek.	[7M]
		(OR)	
10.	a)	On what basis, an ML model is selected? List out criteria and justify your selection.	[7M]
	b)	Discuss the basic principles on which the ChatGPT was designed and list at least 5 of its capabilities and 5 tasks it cannot do.	[7M]