BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH **SEMESTER : VI**
BRANCH: EEE **SESSION : SP/2025**

SUBJECT: EE447 MACHINE LEARNING

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Can machines be made to learn to perform tasks like humans? Give reasons for your answer.	[5]	1,2	2,4
Q.1(b)	Discuss briefly how Find-S algorithm can be used to generalize concepts using specific examples. Give example to enhance clarity.	[5]	2,3	1,2
Q.2(a)	What is the Difference Between Standard Deviation and Variance? What is the relevance of these terms in machine learning?	[5]	1,2,3	1,2
Q.2(b)	How does Bayes' theorem relate MAP and MLE? A person has undertaken a job. The probabilities of completion of the job on time with and without rain are 0.44 and 0.95 respectively. If the probability that it will rain is 0.45, then determine the probability that the job will be completed on time?	[5]	2,3	3,5
Q.3(a)	Discuss two key types of supervised learning and ensemble learning techniques.	[5]	1,2	1,2,3
Q.3(b)	Draw the perceptron model and compare it with a human nerve cell. What are the advantages and disadvantages of Artificial Neural Network	[5]	1,2	2,3
Q.4(a)	What is the difference between decision tree and top down hierarchical clustering method? Discuss the role of information gain, entropy and Euclidean distance in construction of dendrogram structure.	[5]	1,2	2,4
Q.4(b)	What is Expectation-Maximization (EM) algorithm? Draw a flowchart to show its working.	[5]	1,2	1,2
Q.5(a)	What is the role played by Probably Approximately Correct (PAC) and Vapnik–Chervonenkis theory (VC Theory) in computational learning theory?	[5]	1,2	3,4
Q.5(b)	What are the characteristic effects of positive and negative Reinforcement learning?	[5]	1,2	1,2

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