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

CLASS: B.TECH **SEMESTER : VI**
BRANCH: EEE **SESSION : SP/2024**

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)	Enumerate some real world applications of Machine Learning along with the challenges that could arise.	[5]	1,4	1,2,3
Q.1(b)	Define the terms: Hypotheses, Version space, Cross Validation, Curve fitting, and attributes.	[5]	1,2	1
Q.2(a)	Explain the concepts of maximum a Posteriori (MAP) estimation and maximum likelihood estimation (MLE) with suitable examples.	[5]	1,2	1,2,3
Q.2(b)	There are three urns containing 3 white and 2 black balls; 2 white and 3 black balls; 1 black and 4 white balls respectively. There is an equal probability of each urn being chosen. One ball with equal probability is chosen at random. Use Bayes Theorem to find the probability that a white ball is drawn?	[5]	2,3	3,5
Q.3(a)	What is supervised learning? How is it different from unsupervised learning?	[5]	1,2	2,3
Q.3(b)	Draw labelled diagram of a basic perceptron method of learning in ANN and compare it with a human nerve cell?	[5]	1,2	1,2,3
Q.4(a)	What are the different categories of problems in which Unsupervised Learning techniques can be applied? Explain the terms Hard Clustering and Soft Clustering.	[5]	1,2	2.3.4
Q.4(b)	Discuss the application methods of K-means and Hierarchical in data clustering.	[5]	1,3	2,3,5
Q.5(a)	What is the difference between Computational Learning Theory and Statistical Learning Theory?	[5]	1,2,3	2,3,4
Q.5(b)	Show with a practical example how reinforced learning can be used to enhance learning output.	[5]	1,3	3,4,6

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