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<b>Question Paper Code</b>	<b>13505</b>
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025**

## Sixth Semester

## Electronics and Communication Engineering

## 20ECEL609 - MACHINE LEARNING TECHNIQUES

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

**PART - A (MCO) (10 × 1 = 10 Marks)**

**Answer ALL Questions**

PART - A (MCQ) (10 × 1 = 10 Marks)			
Answer ALL Questions			
	Marks	K-Level	CO
1. Machine learning is an application of (a) Block chain (b) Artificial Intelligence (c) Security (d) Block chain and Artificial Intelligence	1	K1	CO1
2. Identify the type of learning in which labeled training data is used. (a) Semi Unsupervised Learning (b) Supervised Learning (c) Unsupervised Learning (d) Reinforcement Learning	1	K2	CO1
3. _____ is a disadvantage of decision trees. (a) It is robust to outliers (b) It prone to be over fit (c) It is Comparable (d) Neither robust nor over fit	1	K1	CO2
4. In the Candidate Elimination algorithm, which type of example is used to refine the Specific hypothesis, S? (a) Positive examples (b) Negative examples (c) Mixed examples (d) Neutral examples	1	K1	CO2
5. Which of the following best describes a perceptron? (a) A single layer feed-forward neural network with pre-processing (b) A neural network that contains feedback (c) A double layer auto-associative neural network (d) An auto-associative neural network	1	K1	CO3
6. Genetic algorithms are (a) A Class of algorithms that build solution and selecting best in a population of candidate solutions (b) Methods based on theory of natural selection (c) Methods of genetically modifying (d) A heuristic search methods used.	1	K1	CO3
7. A Bayesian Belief Network utilizes a _____ to define the probability distributions for each node. (a) Linear Regression Table (b) Conditional Probability Table (c) Decision Tree (d) Markov Matrix	1	K1	CO4
8. _____ is the purpose of applying regularization techniques in the EM algorithm. (a) To increase the likelihood of overfitting. (b) To speed up convergence. (c) To avoid singularity issues and improve stability. (d) To decrease the likelihood of finding the global minimum.	1	K1	CO4
9. In K-Nearest Neighbors, increasing the value of 'K' generally (a) Increases model complexity (b) Reduces noise impact but may blur class boundaries (c) Makes the model more sensitive to outliers (d) Decreases bias	1	K1	CO5
10. In FOCL, the purpose of using background knowledge is to (a) Increase the size of the hypothesis space (b) Eliminate irrelevant features and guide search (c) Make the learning unsupervised (d) Generate random hypotheses	1	K1	CO6

**PART - B (12 × 2 = 24 Marks)**

Answer ALL Questions

- |  |   |    |     |
|--|---|----|-----|
| 11. Define Machine Learning.   | 2 | K1 | CO1 |
| 12. Differentiate supervised and unsupervised learning with an example.  | 2 | K2 | CO1 |
| 13. Mention the issues in Decision tree learning.  | 2 | K1 | CO2 |
| 14. Point out the algorithms of concept learning.  | 2 | K1 | CO2 |
| 15. Does the Back propagation learning algorithm guarantee to find the global optimum solution? Justify your answer. | 2 | K2 | CO3 |
| 16. Describe with an example Neural network representation.  | 2 | K2 | CO3 |
| 17. Name the Bayes optimal classification.   | 2 | K1 | CO4 |
| 18. Give the formulas of basic probability.  | 2 | K1 | CO4 |
| 19. Demonstrate the radial basis function network.   | 2 | K2 | CO5 |
| 20. Give the advantages of instance based methods.   | 2 | K1 | CO5 |
| 21. Illustrate what is Sequential Covering Algorithm.  | 2 | K2 | CO6 |
| 22. Generalize induction as inverted deduction.  | 2 | K2 | CO6 |

**PART - C (6 × 11 = 66 Marks)**

Answer ALL Questions

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|---|----|----|-----|
| 23. a) Analyze the types of machine learning with example for each.   | 11 | K3 | CO1 |
| <b>OR</b>   |    |    |     |
| b) Outline the concept of Deep Learning and Deep Reinforcement Learning to accelerate learning in complex environments. | 11 | K3 | CO1 |
| 24. a) Discuss in detail the Candidate–Elimination Algorithm with an example.   | 11 | K2 | CO2 |
| <b>OR</b>   |    |    |     |
| b) Write a short note on Heuristic Space tools for Machine Learning with an algorithm.                                  | 11 | K2 | CO2 |
| 25. a) Analyze the multi-layer perceptron model with a neat diagram.  | 11 | K3 | CO3 |
| <b>OR</b>   |    |    |     |
| b) Generalize the models of evolution and learning in Genetic algorithm.  | 11 | K3 | CO3 |
| 26. a) Examine in detail about maximum likelihood algorithm.  | 11 | K3 | CO4 |
| <b>OR</b>   |    |    |     |
| b) Illustrate with an example why Gibbs Algorithm is better than the Bayes Optimal classifier.                          | 11 | K3 | CO4 |
| 27. a) Evaluate the inductive bias of k-Nearest neighbor algorithm with example.  | 11 | K3 | CO5 |
| <b>OR</b>   |    |    |     |
| b) Accesses the Locally weighted regression model.  | 11 | K3 | CO5 |
| 28. a) Formulate the concept of inverting resolution model.   | 11 | K3 | CO6 |
| <b>OR</b>   |    |    |     |
| b) Express in detail about the Temporal Difference Learning model with an example.                                      | 11 | K3 | CO6 |