

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***MCA DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025***Third Semester***Master of Computer Applications****MC4301 - Machine Learning****Regulations - 2021****Duration : 3 Hrs****Maximum: 100 Marks****PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	Differentiate Human Learning with Machine Learning.	L2	1	2
2.	Outline the role of the curse of dimensionality in machine learning.	L2	1	2
3.	State the factors affecting the performance of machine learning algorithm?	L1	2	2
4.	Describe the steps involved in Feature Subset Selection.	L1	2	2
5.	Define maximum likelihood estimation with example.	L1	3	2
6.	Point out the major components involved in EM algorithm.	L1	3	2
7.	Organize how to Tackle Overfitting and Under fitting?	L3	4	2
8.	Formulate the principles of gradient descent with its features.	L3	4	2
9.	Infer the challenges faced with the implementation of random forest training algorithm.	L2	5	2
10.	Write a simple example of a Large Margin Intuition.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16= 80)

Q.No	Questions	BLT	CO	Marks
11.	a i Discuss areas where machine learning may be inappropriate or ineffective. Give example.	L2	1	8
	ii Illustrate the different types of data. Give the structure of the data with an example.	L2	1	8
	Or			
	b i Explain the concept and algorithm involved in data preprocessing. Give example.	L3	1	8
	ii Discuss in detail about data quality and remediation and elaborate on different tools with its issues.	L2	1	8
12.	a i Explain interpretability and its role in making models more efficient with example.	L3	2	8

	ii	Interpret the feature engineering and its impact on model performance.	L2	2	8
Or					
	b i	Discuss the process of building Machine Learning model with an example.	L2	2	8
	ii	Suppose the previous day's sales and number of customers show high predictive power. How would subset selection help prioritize these features?	L2	2	8
13.	a i	State Bayes' rule. Discuss its importance in updating beliefs based on new evidence.	L2	3	8
	ii	Explain least squares method to find hypotheses that minimize the error in predictions.	L3	3	8
Or					
	b i	Describe the Naïve Bayes assumption of feature independence and explain its applications and effectiveness despite its simplicity.	L2	3	8
	ii	Describe the Minimum Description Length principle with challenges.	L2	3	8
14.	a i	Elaborate the back propagation process of propagating errors backward to adjust weights in neural networks.	L3	4	8
	ii	Discuss the role of non-linearity with activation function with its types.	L2	4	8
Or					
	b i	Explain the structure of a basic neural network and how it extends to multi-class classification using SoftMax.	L3	4	8
	ii	Illustrate about regularization to reduce overfitting by penalizing large coefficients.	L2	4	8
15.	a i	Describe the AdaBoost algorithm in detail.	L2	5	8
	ii	Discuss the advantages and limitations of AdaBoost, along with scenarios where it is particularly effective.	L2	5	8
Or					
	b i	Explain with an example how SVM aims to maximize the margin between classes for better generalization.	L3	5	8
	ii	Describe the SVM loss function focusing on hinge loss with example.	L2	5	8