PRN:		Course Code :	CST2603

Third Year **B. Tech** End Semester Examination Summer 2024

Machine Learning

Day and Date: 25 MAY 2024 Sat Max Marks: **100**

Time : 02:00PM To 05:00PM Duration: **03** hrs

Instructions:

1. All questions are compulsory.
2. Write equations wherever necessary.

		Marks	Bloom's Level	CO
Q.1	**Attempt the following**			
a)	Explain hypothesis (h) and hypothesis space (H) in detail.	08	L2	1
b)	Explain clustering & association in brief.	08	L2	1
	OR			
b)	Define machine learning and explain the working of machine learning.	08	L2	1
Q.2	**Attempt the following**			
a)	Explain cost function and gradient descent for linear regression with necessary equations.	08	L3	2
b)	What are Bias and Variance in machine learning? Explain difference combinations of bias and variance.	08	L3	2
	OR			
b)	For dataset given below apply linear regression technique and find the value of "y" for x=11.	08	L3	2

x	y
1	3
3	4
5	6
7	7
9	11

Q.3	**Attempt any two from the following**				
a)	Explain decision tree classifier algorithm with an example.	08	L3	2	
b)	What are ensemble methods? Explain Boosting and Random Forest ensemble methods in detail.	08	L3	2	
c)	For the given data set below apply Naïve Bayes Classifier algorithm and find whether car will be stolen or not for instance = {Red, SUV, Domestic}	08	L3	2	

No	Color	Type	Origin	Stolen
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Imported	Yes
6	Yellow	SUV	Imported	No
7	Yellow	SUV	Imported	Yes
8	Yellow	SUV	Domestic	No
9	Red	SUV	Imported	No
10	Red	Sports	Imported	Yes

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Q.4	**Attempt any two from the following**				
	a)	For given data set apply k-means clustering technique and find the cluster elements. K = {2, 3, 4, 10, 11, 12, 20, 25, 30}. Assume k=2	08	L3	3
	b)	Define clustering and List any six differences between supervised and unsupervised learning.	08	L3	3
	c)	Explain SVM with an example.	08	L3	3
Q.5	**Attempt any Two of the following**				
	a)	What is cross validation in machine learning? Explain K-folds and Stratifies K-folds validation techniques with neat diagrams.	09	L2	4
	b)	Explain learning curves with necessary graphs.	09	L2	4
	c)	Explain how leave-one-out and leave-p-out validation techniques are different from each other.	09	L2	4
Q.6	**Attempt any Two of the following**				
	a)	Explain the various components of ANN.	09	L2	4
	b)	Explain Single Layer Feed-forward Neural Network and Multilayer Feed Forward Network.	09	L2	4
	c)	Write a short note on deep learning and List any five differences between machine learning and deep learning.	09	L2	4

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