PRN:		Course Code :	AMT1504

Third Year **B. Tech** End Semester Examination Winter 2023

Machine Learning

Day and Date: wednesday, 06/12/2023 Max Marks: **100**

Time : 10.30 am to 1.30 pm 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 supervised and unsupervised machine learning in detail.	08	L2	1
b)	Explain classification and regression in brief.	08	L2	1
	OR			
b)	What is feature selection in machine learning? Explain any three feature selection techniques in 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=8.	08	L3	2

x	y
1	3
3	4
5	6
7	7

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 Bagging and Blending ensemble methods in detail.	08	L3	2		
c)	For the given data set below apply Naïve Bayes Classifier algorithm and find whether given instance bong to species M or H	08	L3	2		

No	Color	Legs	Height	Smelly	Species
1	White	3	Short	Yes	M
2	Green	2	Tall	No	M
3	Green	3	Short	Yes	M
4	White	3	Short	Yes	M
5	Green	2	Short	No	H
6	White	2	Tall	No	H
7	White	2	Tall	No	H
8	White	2	Short	Yes	H

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

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	b)	Define clustering and List any six differences between supervised and unsupervised learning.	08	L3	3
	c)	Explain K-means clustering 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 how leave-one-out and leave-p-out validation techniques are different from each other.	09	L2	4
	c)	Explain learning curves with necessary graphs.	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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