RAMRAO ADIK INSTITUTE OF TECHNOLOGY, NERUL

(D Y Patil Deemed to be University)

Program: Computer Engineering
End Semester Examination: B.Tech. Semester VI
Course Code: CEC601 **Course Name: Machine Learning**
Time: 2 hour
Max. Marks: 60

Instructions: 1. All three questions are compulsory

Que. No.	Question	Max. Marks	CO	BT
Q1	Solve any **Four**			
i)	Which machine learning tasks come under supervised learning? Illustrate with examples.	5	CO1	BT3
ii)	What is the impact of missing values in the dataset? Explain any one approach to handle the missing values in students' academic data. Assume suitable dataset.	5	CO2	BT4
iii)	Discuss any two evaluation metrics of regression model.	5	CO3	BT2
iv)	Briefly discuss the steps of Random Forest algorithm.	5	CO4	BT2
v)	Illustrate Hierarchical Agglomerative Clustering with example.	5	CO5	BT3
vi)	Discuss the following terms used in reinforcement learning: Agent, Environment and Action	5	CO6	BT2

Que. No.	Question	Max. Marks	CO	BT
Q2	Solve any **Two**			
i)	What is curse of dimensionality? Discuss the Principal Component Analysis technique to reduce the dimensions.	10	CO2	BT2
ii)	A clinical trial gave the following data about the BMI and Cholesterol level of 10 patients. Predict the likely value of Cholesterol level for a patient who has BMI of 25.	10	CO3	BT5
iii)	What is Linear Support Vector Machine? Discuss	10	CO4	BT2

BMI	Cholesterol
19	140
21	189
24	210
28	240
14	130
16	100
23	135
22	166
15	130
18	170

	different terminologies associated with SVM.			

Que. No.	Question	Max. Marks	CO	BT
Q3	Solve any **Two**			
i)	Using k-means algorithm cluster the following 8 samples into 3 clusters: A1=(2,10), A2=(2,5), A3=(8,4), A4=(5,8), A5=(7,5), A6=(6,4), A7=(1,2), A8=(4,9). Consider the initial seeds (centers of each cluster) are A1, A4 and A7. Run the k-means algorithm for 1 epoch only and evaluate the new cluster centroids.	10	CO5	BT5
ii)	Consider the following dataset: Find the root node to form a decision tree. (Use Information Gain measure)	10	CO4	BT4
iii)	Discuss any two real life applications of reinforcement learning.	10	CO6	BT3

Age	Competition	Type	Profit
old	Yes	software	Down
new	No	software	Up
old	No	hardware	Down
new	No	hardware	Up
mid	yes	hardware	Down
mid	No	hardware	Up
mid	No	software	Up
new	yes	software	Up
mid	yes	software	Down
old	No	software	Down

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Course Outcomes (CO) -Learner will be able to:

CO1: Understand the basic concepts of machine learning.
CO2: Extract different feature vectors from the given data.
CO3: Apply different regression techniques on the input data.
CO4: Apply and analyse the performance of classification algorithms.
CO5: Form clusters using various similarity measures.
CO6: Understand the working of reinforcement learning.

BT1- Remembering, BT2- Understanding, BT3- Applying, BT4- Analyzing, BT5- Evaluating, BT6- Creating