D Y PATIL DEEMED TO BE UNIVERSITY RAMRAO ADIK INSTITUTE OF TECHNOLOGY NAVI MUMBAI

14 MAY 2024

RAMRAO ADIK INSTITUTE OF TECHNOLOGY, NERUL

(D Y Patil Deemed to be University)

Program: B.Tech.
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)	Discuss the steps in developing the machine learning application.	5	CO1	BT2
ii)	How the missing values are handled in pre-processing?	5	CO2	BT2
iii)	Compare simple linear regression with multivariate regression	5	CO3	BT4
iv)	Justify why decision-tree algorithm is rule based classification?	5	CO4	BT4
v)	How will you define the number of cluster in k-mean clustering algorithm?	5	CO5	BT4
vi)	How learning is accomplished in reinforcement learning?	5	CO6	BT4

Que. No.	Question	Max. Marks	CO	BT
Q2	Solve any **Two**			
i)	Design ANDNOT function using McCulloch-Pitts neuron. For following cases. **Case 1:** assume that both weights are excitatory i.e w1=1 & w2=1. **Case 2:** Assume that w1=1 and w2= -1	10	CO4	BT6
ii)	Discuss Time series forecasting application with respect to Reinforcement Learning, and explain how this models are evaluate and validate?	10	CO6	BT4
iii)	Find the eigenvalues and eigenvectors for the matrix given below: $A = \begin{bmatrix} 2 & 1 & 3 \\ 1 & 2 & 3 \\ 3 & 3 & 20 \end{bmatrix}$	10	CO2	BT5

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Que. No.	Question	Max. Marks	CO	BT
Q3	Solve any **Two**			
i)	Use the method of least squares using regression to predict the final exam grade of a student who received 71 marks on the midterm exam.	10	**CO3**	**BT5**

Midterm Exam (X)	Final Exam (Y)
72	84
50	63
81	77
74	78
94	90
86	75
59	49
83	79
65	77
33	52
88	74
81	90

ii)	Discuss **"Diagnosing Crop Disease"** with Machine Learning.	10	**CO1**	**BT3**
iii)	Find the clusters using single link technique. Use Euclidean distance and draw the dendogram.	10	**CO5**	**BT5**

Sample no	X	Y
S1	0.40	0.53
S2	0.22	0.38
S3	0.35	0.32
S4	0.26	0.19
S5	0.08	0.41
S6	0.45	0.30

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

CO1. Understand the basic concepts of machine learning.

CO 2. Extract different feature vectors from the given data.

CO 3. Apply different regression techniques on the input data.

CO 4. Apply and analyse the performance of classification algorithms.

CO 5. Form clusters using various similarity measures.

CO 6. Understand the working of reinforcement learning.

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