DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – December - 2019

Branch: B. Tech.(COMPUTER ENGINEERING) **Sem.:- V**
Subject with Subject Code:- MACHINE LEARNING (BTCOC503) **Marks: 60**
Date:- 13/12/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. a) Define Machine Learning and Enlist Applications of Machine Learning (4)
b) Differentiate between Supervised and Unsupervised Learning (4)
c) List the issues in basic ID3 Decision Tree Algorithm. (4)
Interpret the algorithm with respect to overfitting the data

Q.2. a) Classify Fruit={Yellow, Sweet, Long} using Bayes learning , Data as given in table (6)

Fruit	Yellow	Sweet	Long	Total
Orange	350	450	0	650
Banana	400	300	350	400
Other	50	100	50	150

OR

a) Predict the class of new data point x=1 and y=1 using K-NN algorithm assume k=3 (6)

x	y	class
-1	1	-
0	1	+
0	2	-
1	-1	-
1	0	+
1	2	+
2	2	-
2	3	+

C7B584B90A6F2E4613757AB6D172EA00

b) Discuss Maximum Likelihood and Least Square Error Hypothesis. (6)

Q.3. a) How does SVM works? (6)
b) What is logistic regression? Differentiate between Linear and Logistic Regression (6)

Q.4. a) Explain the concept of a Perceptron with a neat diagram (4)
b) What is back propagation? (4)
c) Explain how to learn Multilayer Networks (4)

Q.5. a) What is PAC learning model?
Explain the sample complexity for Finite hypothesis spaces (6)
b) Define and explain "Shattering a set of Instances" with suitable example. (6)

Q.6. a) What is Hierarchical Clustering? Consider following distance matrix and apply hierarchical clustering to cluster the objects u,v,w,x,y (6)

	u	v	w	x	y
u	0	1	2	2	3
v	1	0	2	4	3
w	2	2	0	1	5
x	2	4	1	0	3
y	3	3	5	3	0

b) Given that the Observations are already clustered in two clusters C1 and C2 as shown in table (6)

Cluster C1			Cluster C2		
Obs.	X1	X2	Obs.	X1	X2
A	2	4	C	9	3
B	8	2	E	8.5	1
D	1	5			

Apply K-Mean clustering algorithm to find and Plot initial and final distribution of observations in C1 and C2

Paper End