PRN	

QP Code DW-118

D.K.T.E. Society's TEXTILE AND ENGINEERING INSTITUTE, ICHALKARANJI.

(An Autonomous Institute)

Semester End Examination - Winter 2019-20

Class - Program	Third Year B.Tech. (CS/IT)
Course Code	CSL303/ITL303
Course Title	Machine Learning

Day & Date	Monday,11/11 /2019
Time	10:00 AM To 1:00 PM
Max.Marks	100

Instructions :

1. *All Questions are compulsory; assume suitable data if necessary and mention it clearly.*
2. *Mobile phones and programmable calculators are strictly prohibited.*
3. *Writing anything on question paper(except PRN), exchange/sharing of stationery, calculator etc. are not allowed.*

Que No 1 A — Identify two clusters in following data using K-Mean Clustering Algorithm — Marks: 5 | BL: 3 | CO: 3

Object	A	B	C	D	E
X1	25	35	75	81	87

Attempt any one of B & C

B — Dataset of Tennis game played between Federa and Nadel is given below. You are required to predict the winner of next match using the decision tree. Find the root node of the decision tree for given dataset — Marks: 10 | BL: 3 | CO: 3

Time	Match_type	Court_surface	Outcome
Morning	Master	Grass	F
Afternoon	Grand_slam	Clay	F
Night	Friendly	Hard	F
Afternoon	Friendly	Mixed	N
Afternoon	Master	Clay	N
Afternoon	Grand_slam	Grass	F
Afternoon	Grand_slam	Hard	F
Afternoon	Grand_slam	Hard	F
Morning	Master	Grass	F
Afternoon	Grand_slam	Clay	N
Night	Friendly	Hard	F
Night	Master	Mixed	N
Afternoon	Master	Clay	N
Afternoon	Master	Grass	F
Afternoon	Grand_slam	Hard	F
Afternoon	Grand_slam	Clay	F

Note: - Outcome F : Fadera Wins , Outcome N : Nadel Wins

C — Use data in Q.1 B to predict winner of the match for the attributes as Time = afternoon ,Match_type = Grand_slam and Court_surface = Hard, using Bayesian Classifier. — Marks: 10 | BL: 3 | CO: 3

2 Attempt any three of A, B, C & D

		Marks	BL	CO
A	Explain machine learning architecture?	5	2	1
B	Explain different types of machine learning techniques.	5	2	1
C	What is regression? Explain Different types of regression.	5	2	1
D	Derive equation for backpropagation technique in multilayer neural network.	5	2	1

Que No		Question	Marks	BL	CO
3		**Attempt any three of A, B, C & D**			
	A	Explain different types of recommender system.	5	2	1
	B	Explain cosine similarity technique.	5	2	1
	C	What are the merits and demerits of Decision tree.	5	2	1
	D	Explain the characteristics of time series.	5	2	1
4	A	i) Calculate linear regression parameters for following data.	15	3	3

X	Y
7	22.5
9	19
11	34.5
13	41.2
15	46

ii) Find the nearest user of "Sanjay" using K-NN with K=1.

User/Movie	Airlift	Fantush	Hera Pheri	Welcome	Parmanu
Sanjay	4	3	5	3	0
Ajit	0	3	5	4	4
sunil	2	3	5	0	0
Amit	0	4	4	4	4
Dinesh	3	4	5	3	0

iii) Create two groups from following students using Agglomerative Hierarchical Clustering.

Student	A	B	C	D	E
Marks	35	45	48	67	71

5		**Attempt any two of A, B & C**			
	A	Following table provides data used for linear regression having input as "Study Hours" and out as "Marks".	10	4	2

Study Hours	Marks
10	50
12	55
15	60
20	70
25	77
30	95

There are two sets of regression parameters, one with W0 = 15.75 and W1= 3.07 and second set contains W0 = 16.75 and W1 = 3.3. Which parameter set out of these are best? Why?

	B	Analyze the following Artificial Neural Network with every neuron having "hardlimit" Thresholding function and determine the operation it has implemented.	10	4	2

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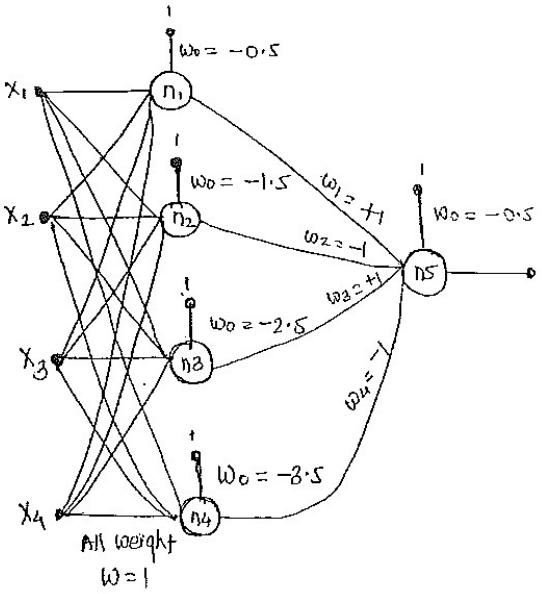
Que No		Question	Marks	BL	CO
					
	C	Following table gives the result of an email classification system. Find the performance of this system. Is this system useful or Not? Why?	10	4	2

Sr. No.	Actual Email class	Predicted email class
1	N	N
2	N	N
3	S	N
4	S	S
5	S	S
6	S	S
7	N	N
8	N	N
9	S	N
10	S	S
11	N	N

6		Attempt any four of A, B, C, D & E			
	A	What are the reasons of incorporating recommender system in information systems?	5	2	1
	B	What is Time series? Explain different techniques used to make time series prediction	5	2	1
	C	Explain Bayesian Classifier.	5	2	1
	D	Explain activation functions used in an artificial neural network.	5	2	1
	E	What is Feature Engineering? What are the steps in Feature Engineering?	5	2	1

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