## TE / ETRX/Sem-VI/C2019/Machine Learning/May-2022 University of Mumbai

**Examinations Summer 2022** 

Time: 2 hour 30 minutes

Paper Code-93775 Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions a compulsory and carry equal marks
1.	Machine learning is a branch of
Option A:	Artificial intelligence
Option B:	speech processing
Option C:	Language processing
Option D:	java
2.	What does K stand for in K mean algorithm?
Option A:	Number of Clusters
Option B:	Number of Data
Option C:	Number of Attributes
Option D:	Number of Iterations
3.	Feature selection tries to eliminate features that are
Option A:	Rich
Option B:	important
Option C:	Irrelevant
Option D:	Relevant
4.	During the treatement of cancer patients, the doctor needs to be very caref about which patients need to be given chemotherapy. Which metric should we us in order to decide the patients who should given chemotherapy?
Option A:	precision
Option B:	recall
Option C:	call
Option D:	score
5.	Targetted marketing, Recommended Systems, and Customer Segmentation as applications in which of the following
Option A:	Supervised Learning: Classification
Option B:	Unsupervised Learning: Clustering
Option C:	Unsupervised Learning: Regression
Option D:	Reinforcement Learning
6.	CART stands for
Option A:	classification and regression tree
Option B:	choosing a regression task
Option C:	classification and regression task
Option D:	classification along regression task
7.	Naïve Bayes Algorithm is a learning algorithm.
Option A:	Supervised
Spuon A.	
	Reinforcement
Option B: Option C:	Semi supervised

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8.	Which of the following can only be used when training data are linearly separable?
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Option A:	linear hard-margin svm
Option B:	linear logistic regression
Option C:	linear soft margin svm
Option D:	the centroid method
9.	Impact of high variance on the training set?
Option A:	depents upon the dataset
Option B:	underfitting
Option C:	both underfitting & overfitting
Option D:	overfitting
10.	What do you mean by a hard margin?
Option A:	The SVM allows very low error in classification
Option B:	The SVM allows very high error in classification
Option C:	The SVM allows no error in classification
Option D:	The SVM does not allow error in classification

Q2. (20 Marks Each)	Solve any Two Questions out of Three 10 marks each
A	Explain the steps of developing Machine Learning applications in detail.
B	Explain regression line, scatter plot, error in prediction; best fitting line.
C	Cluster the following eight points (with $(x, y)$ representing locations) into three 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) Initial cluster centers are: A1(2, 10), A4(5, 8) and A7(1, 2). The distance function between two points $a = (x1, y1)$ and $b = (x2, y2)$ is defined as- d(a, b) = $ x2 - x1  +  y2 - y1 $ Use K-Means Algorithm to find the three cluster centers after the one iteration
Q3.	Solve any Two Questions out of Three 10 marks each
(20 Marks Each)	
A	Compare and contrast Linear and Logistic regressions with respect to their mechanisms of prediction.
В	Explain in detail PCA for dimension reduction.

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	Find comp	olete linkage meth	od of hie	rarchic	al clus	stering to fi	nd cluste	
	of 5 data p	points with following	ng distar	ice mat	rix.	er e e e		
		1	2	3 4	5			
		1 0	9	3 6	11			
C		2 9	0	7 5	10			
		3 3	7	0 9	2			
		4 6	5	9 0	8		10	
		5 11	10	2 8	0			
	-			7.5				
Q4.	Solve any	Two Questions o	ut of Th	ree		10 m	arks eac	
(20 Marks Each)								
A	Explain K-	-mean clustering a	lgorithm	giving	suital	ole exampl	e. Also.	
	explain ho	w K-mean clusteri	ng differ	s from	hierar	chical clus	tering.	
В	What is su	pport vector mach	ine? Wh	at do yo	ou me	an by supp	ort	
	What is support vector machine? What do you mean by support vectors, hyper plane and margin, support vectors? What will be the							
	boundary for one dimensional data, two dimensional data and three							
	dimensional data. Explain with suitable examples.							
	diminibilities	ai data. Explain w	th suitab	le exan	nples.			
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	What is SV	/M? Explain the fo	ollowing	terms:	hyper	plane, sepa	rating	
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