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Roll Number: _____

Thapar Institute of Engineering and Technology Patiala

Computer Science and Engineering Department

BE Third Year August 2019 Auxiliary Exam	UML501: Machine Learning
Time: 3 Hours	Max Marks:100
Instructor: Dr. Singara Singh Kasana	

Note: Attempt all questions. All parts of a question must be answered in order. A new question must start from new page.

Q1. [20]

(a) Discuss the principle of Bayesian Learning, with suitable example.
(b) What is KNN? Discuss the working of kNN approach.

Q2 [20]

How decision tree is used in machine learning models? Discuss and compare the procedures which are used in creating a decision tree

Q3. [10]

Calculate model evaluation parameters for regression model b/w observed pH values(X) and predicted pH values (Y) of water sample. Make assumption if any.

X	5.5	6.5	6.25	7.2	7.4	6.3	6.4	7.6
Y	6.1	6.3	6.5	7.6	6.9	6.2	6.8	7.5

(i) Correlation (r)
(ii) Determinant of Coefficient (R)
(iii) Root Mean Squared Error
(iv) Mean Absolute Error
(v) Accuracy (with ±0.2 error)

Q4. Compare between inductive and analytical learning in a tabular manner. [10]

Q5 [20]

Why clustering is used? Discuss different types of clustering. Write the steps of K Mean algorithm and calculate these steps on the following given data:

Marks in ML	Marks in DS
20	100
20	50
80	40

P.T.O.

		50	80
		70	50
		60	40
		10	20
		40	90
	Create three clusters, by taking initial centers as $C_1(20, 100)$, $C_2(50,80)$ and $C_3(10,20)$. Use Rectilinear distance as the similarity measure which is defined between two vectors v1(x1,y1) and v2(x2,y2) as $d(v1, v2) = \|x2 - x1\| + \|y2 - y1\|$		
Q6	Discuss GA optimization model, by giving suitable diagram. Also give examples of cross over and mutation, by assuming suitable data and fitness function.		[20]

All the Best

Model Solution