THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY

Autonomous College Affiliated to University of Mumbai

Approved by All India Council for Technical Education(AICTE) and Government of Maharashtra(GoM)

Conferred Autonomous Status by University Grants Commission (UGC) for 10 years w.e.f. A.Y.2019-20

Amongst Top 200 Colleges in the Country, Ranked 101st in NIRF India Ranking 2019 in Engineering College category

• QS World University Rankings • Programmes Accredited by National Board of Accreditation (NBA), New Delhi

• Institute Accredited by National Assessment and Accreditation Council (NAAC), Bangalore

END SEMESTER EXAMINATION, DECEMBER 2022
B. E. SEMESTER VII (CBCGS-H 2019)

Branch:	Information Technology	Q.P. Code:	4713C0012
Subject:	Machine Learning for IT Application Development	Duration:	3 hours
Subject Code:	PCC IT 701	Max.Marks:	75

Instructions:
1. All sections are compulsory
2. Figures to the right indicate full marks.
3. Assume suitable data if necessary and state the assumptions clearly.

Section-I Short Answer Questions (Answer any 05 questions out of 06) (10 Marks)

Q. No.	(Fundamental, Core Types)	Marks	CO	RBT Level	PI
1.	What is Bias and Variance in a Machine Learning Model?	2	CO1	R,U	1.6.1
2.	Why Data in the real world is dirty?	2	CO2	R,U	1.6.1
3.	List down disadvantages of Linear Regression	2	CO3	R,U	1.6.1
4.	Define hyperplane and support vectors in SVM	2	CO4	R,U	1.6.1
5.	What is Type 1 and Type 2 error?	2	CO5	R,U	1.6.1
6.	Define Reinforcement Learning	2	CO6	R,U	1.6.1

Section-II Descriptive Answer Questions (Answer any 05 out of 07) (25 Marks)
(Descriptive, Comprehension Types)

1	Consider the following data set having the data Use FIND-S Algorithm to find most specific hypothesis	5	CO1	A	1.7.1
2	Find Q1, Q2, and Q3 for the following data set. Identify any outliers. Design a boxplot. {5,40,42,46,48,49,50,50,52,53,55,56,58,75,102}	5	CO2	E,C	3.8.1
3	Explain different data transformation methods with example.	5	CO2	A	1.7.1
4	What is Regularization? How does Regularization Work? Give one example.	5	CO3	U	1.6.1
5	Explain bagging method with example	5	CO4	A	1.7.1
6	What is hyper parameter tuning in ML? Explain strategies for hyper parameter tuning	5	CO5	AN	2.1.3

Time	Weather	Temperature	Company	Humidity	Wind	Goes
Morning	Sunny	Warm	Yes	Mild	Strong	Yes
Evening	Rainy	Cold	No	Mild	Normal	No
Morning	Sunny	Moderate	Yes	Normal	Normal	Yes
Evening	Sunny	cold	Yes	High	Strong	Yes

7	Discuss Advantages and Disadvantages of Expectation-Maximization Algorithm	5	CO6	U
Section-III	**Long Answer Questions (Answer any 04 out of 06) (Application, Analytical, Evaluation, Design Type)**			CO
1	Enumerate different feature selection techniques in machine learning	10	CO2	E
2	Evaluate different Evaluation Metrics for Regression Problems	10	CO3	AN
3	Explain with the help of example given below, the working of a decision tree (CART) and find the Gini index. Create a decision tree.	10	CO4	C

Age	Gender	Sportive
22	F	Yes
24	M	Yes
30	F	Yes
31	F	No
27	F	No
32	M	No
25	F	Yes
30	M	No
24	F	Yes
21	F	Yes
29	M	yes
26	M	No
21	M	No

Note: Divide data in binary for *age =< 25 or age > 25*.

4	Describe Support Vector Machine (SVM) Algorithm? Apply the working of SVM algorithm to any use case scenario.	10	CO4	A
5	How Gradient Descent algorithm works? What are different types of Gradient Descent algorithm?	10	CO5	AN
6	What are the key elements of reinforcement learning? Explain reinforcement learning workflow	10	CO6	A