JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION April 2024

B.Tech-VI Semester (CSE/IT)

COURSE CODE (CREDITS): 18B1WCI634 & 18B11BI611 (2) MAX. MARKS: 25

COURSE NAME: Machine Learning & Machine Learning for Bio-Informatics

COURSE INSTRUCTORS: **Mr. Praveen Modi**, Dr. Aman Sharma, MAX. TIME: 1:30Hr

Dr. Shubham Goel, and Mr. Kapil Rana

***Note: (a)** All questions are compulsory.*

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(d) Write the answer of the question belonging to the same part in the same order.

Q1. Find the linear regression model equation Y = WX + b using either mean method or gradient descent method (w and b are initialized to 1, up to two steps), where X is the independent variable and Y is the dependent variable, for the following dataset? Highlight the used method. [5] (CO4)

X	15	23	18	23	24	22	22	19	19	16	24	11	24	16	23
Y	49	63	58	60	58	61	60	63	60	52	62	30	59	49	68

Q2. Which statements are TRUE or False? [5] (CO1)

(a) The Purity parameter can be used as a performance measure for the classification model.

(b) Root Mean Square Error is a performance measurement for the regression model.

(c) Support vector machine is an example of ensemble learning algorithm.

(d) Quantile plot can be used for the outlier detection.

(e) Mean and Mode can be calculated for the interval-scale attribute

Q3. Suppose in the dataset there are three binary features (X_1, X_2, and X_3) and one class label binary attribute Y ={1,2}. How the Naive Bayes classifier model test the tuple (1, 0,1) for the following dataset?

[5] (CO3)

Instance	X_1	X_2	X_3	Y
1	1	1	1	1
2	0	0	1	2
3	0	1	0	1
4	1	1	1	2
5	0	0	0	1
6	1	1	1	2

Q4. (a) Explain the soft margin in SVM classification? [5](CO4)

(b) Write the equation of three kernel trick functions?

Q5. Which attribute among the attribute set can be selected for the root node in the decision tree using the CART algorithm for the following dataset with class labeled Job –Offered? [5] (CO2)

CGPA	Communication	Aptitude	Programming	Job-Offered
High	Good	High	Good	Yes
Medium	Good	High	Good	Yes
Low	Bad	Low	Good	No
Low	Good	Low	Bad	No
High	Good	High	Bad	Yes
High	Good	High	Good	Yes
Medium	Bad	Low	Bad	No
Medium	Bad	Low	Good	No
High	Bad	High	Good	Yes
Medium	Good	High	Good	Yes
Low	Bad	High	Bad	No
Low	Bad	High	Bad	No
Medium	Good	High	Bad	Yes
Low	Good	Low	Good	No
High	Bad	Low	Bad	No