JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-5th Semester (ECE)

COURSE CODE (CREDITS): 20B1WEC532(3)   MAX. MARKS: 25

COURSE NAME: Introduction to Machine Learning

COURSE INSTRUCTORS: *Ncc*   MAX. TIME: 1 Hour 30 Min

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. What is multiple linear regression? Write down the equation for multiple linear regression in matrix form for **m** number of data points and **n** number of independent variables. Explain the assumptions in multiple linear regression analysis.   **CO (3) [5]**

Q2. Find the coefficient of regression and error term from the given data.

Y	9	10	13	14	16
x1	1	3	4	6	7

CO (2) [5]

Q3. Given matrix $A = \begin{bmatrix} 1 & 1 & -3 \\ -1 & 0 & 0 \end{bmatrix}$, calculate and show that the matrices A^TA and AA^T are both symmetric.   **CO (1) [5]**

Q4.   **CO (1) [5]**

The system of equations in matrix form

$$AX = B$$

has the following solutions: $X_1 = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix}$ for $B_1 = \begin{bmatrix} 2 \\ 13 \\ 3 \end{bmatrix}$, $X_2 = \begin{bmatrix} 0 \\ -1 \\ 1 \end{bmatrix}$ for

$B_2 = \begin{bmatrix} 4 \\ 2 \\ 2 \end{bmatrix}$, $X_3 = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ for $B_3 = \begin{bmatrix} 4 \\ 5 \\ 3 \end{bmatrix}$.

Find X for $B = \begin{bmatrix} 1 \\ -9 \\ -1 \end{bmatrix}$.

Q5. Define the following terms with respect to the classification model

(i). Sensitivity   (ii). Specificity   (iii). Precision   (iv). Recall   (v). F-measure
                    CO (2) [5]