



## AUTUMN MID SEMESTER EXAMINATION-2022

School of Computer Engineering  
Kalinga Institute of Industrial Technology, Deemed to be University  
Machine Learning  
[CS 3035]

Time: 1 1/2 Hours

Full Mark: 20

*Answer any four Questions including Q.No.1 which is Compulsory.*

*The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.*

1. Answer all the questions. [ 1 x 5 ]
  - a) Out of the Following Examples, Which would you address using an supervised learning Algorithm?
    - (i) Given email labeled as spam or not spam, learn a spam filter
    - (ii) Given a set of news articles found on the web, group them into set of articles about the same story.
    - (iii) Given a database of customer data, automatically discover market segments and group customers into different market segments.
    - (iv) Find the patterns in market basket analysis
  - b) Which machine learning models are trained to make a series of decisions based on the rewards and feedback they receive for their actions?
    - (i) Supervised Learning
    - (ii) Unsupervised Learning
    - (iii) Reinforcement Learning
    - (iv) All of the above
  - c) Overfitting is attributed by high bias low variance.
    - (i) True
    - (ii) False
  - d) Why KNN is called as lazy learner algorithm?
  - e) State two advantages of Gradient Descent method over Least square method?
2. (a) Explain at least 5 different metrics with appropriate mathematical expressions for assessing regression performance of machine learning models. [ 3 Marks ]
  - (b) Draw a comparison between Linear regression and Logistic Regression. [ 2 Marks ]



3. (a) Give one real life application each of supervised and unsupervised algorithm. Differentiate between the two leanings. [ 3 Marks ]

(b) We require low bias and low variance ate the same time for achieving good generalized performance.Explain the bias-variance trade-off using visual representations. [ 2 Marks ]

4. (a) Using K-NN algorithm and the given data set, predict the class label of the test data point (8,5), where K=3 and Euclidean distance. [3 Marks]

X Y Label

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4.2 3.8 0

6.5 7.7 1

7.3 8.6 1

5.7 5.9 0

8.0 8.1 1

10.0 6.5 1  
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(b) Discuss the important features of data partition in cluster analysis and discuss about K-means clustering. [ 2 Marks]

5) (a) Fit a straight line  $Y=a+bX$  to the data by the method of least squares. [3 Marks]

X	5	10	15	20	25
Y	16	19	23	20	30

(b) Explain the function of tuning parameter  $\lambda$  in Regularized Linear Regression? [2 Marks]

\*\*\* Best of Luck \*\*\*