M.Sc IT Sem-III

Paper / Subject Code: 90921 / Information Tech.: Machine Learning (R-2020)

(Time: $2\frac{1}{2}$ hours)

[Total Marks: 60]

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculator is **allowed**.

1. Attempt *any two* of the following: **12**

a. Explain in brief various types of machine learning models
b. Differentiate between Supervised and Unsupervised Learning.
c. Explain Predictive and Descriptive task used in machine learning models.
d. What is feature transformation and feature selection?

2. Attempt *any two* of the following: **12**

a. Explain the difference between Bias and Variance.
b. Explain the role of Confusion Matrix for checking the accuracy of the model.
c. Write a note on ROC and AUC.
d. Explain the importance of Classification and Regression with suitable example.

3. Attempt *any two* of the following: **12**

a. Write a detailed note on Principal Component Analysis
b. Explain in detail the Maximum Likelihood Estimation
c. Explain in detail regularized regression.
d. Write a detailed note on Support Vector machine.

4. Attempt *any two* of the following: **12**

a. Write a short note on Association Rule Mining.
b. Write short note on Hierarchical Clustering
c. Define KNN and mention all the steps of KNN algorithm.
d. Write a short note on entropy and information gain used in Decision Tree

5. Attempt *any two* of the following: **12**

a. Write a short note on Deep Learning.
b. Explain Bagging and Boosting in detail.
c. Write a short note on Ensemble learning
d. Explain Reinforcement learning with an example.
