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B.Tech. (Computer Science & Engineering)
8th Semester (G-Scheme)
Examination, July-2022
MACHINE LEARNING
Paper- PCC-CSE-402-G

Time allowed : 3 hours]

[Maximum marks : 75

Note: Attempt five questions in all, selecting at least one question from each section. Question No.1 is compulsory. All questions carry equal marks.

1. Explain the following:
 - (a) Learning
 - (b) Co-variance of a Data Matrix
 - (c) Reinforcement Learning
 - (d) Linear Regression
 - (e) Boosting
 - (f) Median absolute deviation (MAD) $6 \times 2.5 = 15$

Section-A

2. Define Machine Learning. Explain with examples why machine learning is important. 15
3. (i) Differentiate between Supervised, Unsupervised and Reinforcement learning. Explain with suitable examples. 8
(ii) Discuss any five examples of machine learning applications. 7

Section-B

4. Compare Feature Extraction and Feature Selection techniques. Explain how dimensionality can be reduced using subset selection procedure. 15
5. Use Principle component analysis (PCA) to arrive at the transformed matrix for the given matrix A. 15

$$A^T$$

$$\begin{bmatrix} 2 & 1 & 0 & -1 \\ 4 & 3 & 1 & 0.5 \end{bmatrix}$$

Section-C

6. What is the goal of the support vector machine (SVM)? How to compute the margin. 15
7. (a) Explain Naive Bayes Classifier with an Example. 10
- (b) Explain regression with an example. 5

Section-D

8. (a) Explain the k-Means Algorithm with an example. 10
- (b) Describe the random forest algorithm to improve classifier accuracy. 5
9. Explain the following:
 - (i) Receiver Operating Characteristic Curve (ROC)
 - (ii) Confusion Matrix 15