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011703**Dec. 2021****B.Tech. (IT) - VIIth SEMESTER****Machine Learning (PEC-ITD-702)**

Time : 90 Minutes]

[Max. Marks : 25

Instructions :

1. *It is compulsory to answer all the questions (1 mark each) of Part-A in short.*
2. *Answer any three questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) What are Support Vectors in SVMs? (1)
- (b) Differentiate between linear regression and logistic regression. (1)
- (c) Write two examples of generative models in machine learning. (1)
- (d) Write any two differences between supervised and unsupervised learning. (1)
- (e) What is meant by confusion matrix? (1)
- (f) How will you evaluate machine learning algorithms? (1)

- (g) What are the main components of time series? (1)
- (h) Write example of each linearly separable and linearly non-separable problem. (1)
- (i) What is meant by kernel in SVM? (1)
- (j) What Is the Role of Activation Functions in a Neural Network? (1)

PART - B

2. (a) Consider the following training data for the Naive Bayes Classifier to predict the Target Value "Employable/not employable" for the instance (3)
- < Yes, Engineering, Medium >

S. No.	Experience over 5 years	Major	ILETS score	Employable/Not employable
1	Yes	Engineering	Medium	Employable
2	Yes	BIT	Low	not employable
3	No	Management	Medium	not employable
4	No	BIT	High	Employable
5	Yes	Management	Medium	Employable
6	Yes	Management	Low	not employable
7	No	BIT	Low	not employable
8	Yes	Engineering	Medium	not employable
9	Yes	BIT	High	Employable
10	No	Management	Medium	not employable

- (b) Explain how a decision tree is created using an example. (2)

3. (a) Explain PCA in detail with its Advantages and disadvantages. (2)
- (b) Explain matrix factorization and matrix completion using any application. (3)
4. Differentiate between bagging and boosting. Explain Random Forest algorithm and explain when you would prefer random forest over decision trees and why? (5)
5. (a) Explain CNN model in detail. (3)
- (b) Why LSTM is better than RNN. (2)
6. Write short note on the following :
- (a) Feature representation Learning. (2)
- (b) Bayesian Learning and inference. (3)