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Total Pages : 3

**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	I LETS 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)