

**504106****Mar. 2022****M.Tech. (CSE) 1st Semester  
Machine Learning (MCS-18-106)**

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) Describe the role of machine learning in the following applications : (i) Google home or Alexa (ii) Unmanned Vehicles. (1)
- (b) What can be different components of time series data? (1)
- (c) If you have a task which is to show relative ads to target users, which algorithm you should use for the task? (1)
- (d) What is sparse modelling? (1)
- (e) How is multi class classification achieved? (1)
- (f) What is entropy and gini index? (1)

- (g) What is stochastic gradient? (1)
- (h) What is bias variance dilemma? (1)
- (i) What is semi-supervised learning? (1)
- (j) What is GMM? (1)

### **PART-B**

- 2. (a) What are support vectors? Explain soft margins. (3)
- (b) What do you mean by a linear regression? Which applications are best modelled by linear regression? (2)
- 3. (a) Explain with example k-fold cross validation. (2)
- (b) Define Bayes' Theorem. Elaborate Naive Bayes' Classifier working with example. (3)
- 4. Explain various Ensemble Methods in detail. (5)
- 5. (a) How active learning differs from reinforcement learning? (2)
- (b) What is principal component Analysis (PCA), when it is used? (3)
- 6. (a) Explain feed forward neural network model with diagram. (3)
- (b) What are applications of IOT? (2)