# GIET UNIVERSITY, GUNUPUR – 765022
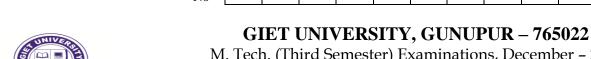## M. Tech. (Third Semester) Examinations, December – 2022
### MPEEC3012 – Pattern Recognition and Machine Learning
(ECE)

Time: 3 hrs                                                                Maximum: 70 Marks

**(The figures in the right hand margin indicate marks.)**

**PART – A**                                                          **(2 x 10 = 20 Marks)**

Answer **ALL** questions

| | | CO# | Blooms Level |
|---|---|---|---|
| a. | Define irreducible error. | 2 | 3 |
| b. | What do you mean by rationality of an agent? | 2 | 3 |
| c. | List out some of the benefits of machine learning | 1 | 2 |
| d. | What are the different processes in data preparation? | 2 | 1 |
| e. | Differentiate between insufficient data and non-representative data? | 2 | 2 |
| f. | Draw and explain a perceptron. | 2 | 2 |
| g. | How do classification and regression differ? | 3 | 1 |
| h. | What do you understand by the Confusion Matrix? | 3 | 2 |
| i. | Define entropy and information gain. | 3 | 3 |
| j. | Differentiate between Random forest and Decision tree? | 3 | 2 |

**PART – B**                                                          **(10 x 5 = 50 Marks)**

Answer **ANY FIVE** questions

| | | Marks | CO# | Blooms Level |
|---|---|---|---|---|
| 2. a. | Describe briefly the different steps of machine learning. | 5 | 1 | 2 |
| b. | Explain briefly the need of machine learning. | 5 | 2 | 1 |
| 3. a. | List out the different challenges associated with machine learning. | 5 | 2 | 1 |
| b. | Discuss briefly the different types of machine learning with suitable examples. | 5 | 1 | 2 |
| 4. a. | What is the need of data preprocessing and discuss about different preprocessing techniques. | 5 | 2 | 2 |
| b. | What are the different types of data in machine learning? Discuss it in aspect of data transformation. | 5 | 2 | 1 |
| 5. a. | Discuss about bias-variance tradeoff. | 5 | 3 | 1 |
| b. | List out the different steps involved in reinforcement learning. | 5 | 2 | 1 |
| 6. a. | The sales of a company (in million dollars) for each year are shown in the table below.<br>x (year)   2005  2006  2007  2008  2009<br>y (sales)   12    19    29    37    45<br>i) Find the least square regression line y = a x + b.<br>ii) Use the least squares regression line as a model to estimate the sales of the company in 2012. | 5 | 3 | 2 |
| b. | Explain the difference between KNN and K-means Clustering. | 5 | 3 | 1 |
| 7. a. | What is a Decision Tree? Explain it with an example. | 5 | 3 | 1 |
| b. | Discuss about the steps involved in PCA? | 5 | 3 | 1 |
| 8. a. | What are the different measures of spread in statistics? Discuss briefly | 5 | 4 | 2 |
| b. | What Are the Different Layers on CNN? | 5 | 4 | 1 |

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