Course: B. Tech. Computer Science and Engineering (AI/ML)
Subject: Machine Learning,
Subject Code: ETCS-206
Semester: IV

Time: 03 Hours **Max Marks: 70**

Instructions to the Students:

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of short answer type. All questions are compulsory. Each question carries 02 marks.
3. Section B comprises 8 long answer type questions out of which students must attempt any 5. Each question carries 10 marks.
4. Do not write anything on the question paper.

Q.No.	SECTION –A (SHORT ANSWER TYPE QUESTIONS)	Marks
1. a.	In the context of logistic regression, define the prediction and loss function.	(2)
b.	What are the issues in decision tree induction?	(2)
c.	With a suitable example explain back-propagation in neural Network?	(2)
d.	What are some methods of reducing dimensionality?	(2)
e.	Strategy for model selection and feature selection	(2)
f.	What is the Ensemble methods?	(2)
g.	What do you understand by deep Learning?	(2)
h.	Explain Time-Series data with example	(2)
i.	What are the elements of reinforcement learning?	(2)
j.	Explain semi-supervised learning with suitable example	(2)

SECTION –B (LONG ANSWER TYPE QUESTIONS)

2.	a)	Assume we are given task of building a system to distinguish junk mail. What is in a junk mail that lets us know that it is junk? How can the computer detect junk through a syntactic analysis? What would we like the computer to do if it detects a junk mail – delete it automatically, move it to a different file or just highlight it on the screen?	(5) (5)

b) Which algorithm can be used to fit the data over a linear line? Is that algorithm supervised or unsupervised? And how do you calculate the cost for that algorithm.

3. a) What is a decision tree & discuss the use of decision tree for classification purpose with an example. (5)

b) Draw the perceptron network with the notation. Drive an equation of gradient decent rule to minimize the error (5)

4. a) Briefly describe/explain Bayesian Networks and list two uses of these networks. (5)

b) What is the goal of Support Vector Machine (SVM)? How to compute the margin? (5)

5. Discuss the Generative models, types of Generative models and example of each. (10)

6. How K-mean Clustering works, when do we say the K-means algorithm has converged or when do we stop cluster reorganization in K means. (10)

7. a) Differentiate between Bagging and Boosting (5)

b) write a short note on Statistical Learning Theory (5)

8. a) Discuss how Deep Learning is different from Machine Learning (10)

b) Discuss various models for IOT applications.

9. a) differentiate between Linear Regression and Logistic Regression methods (5)

b) Discuss various learning techniques of machine learning and classification methods for IOT applications, (5)

===END OF PAPER===