

Total No. of Questions : 8]

SEAT No. :

P-6552

[Total No. of Pages : 2

[6181]-102

**B.E. (Computer Engineering)**  
**MACHINE LEARNING**  
**(2019 Pattern) (Semester - VII) (410242)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume suitable data if necessary.

**Q1) a) Differentiate between overfitting and underfitting. [6]**

b) The table below shows the number of grams of carbohydrates, X and the number of Calories, Y of six different foods. Find linear regression equation for this dataset. [8]

Carbohydrates (X)	8	9.5	10	6	7	4
Calories (Y)	12	138	147	88	108	62

Also find the value of Y for X = 12

c) Explain Bias Variance Trade off. [4]

OR

**Q2) a) What is Linear Regression? Explain the concept of Ridge regression. [9]**

b) Explain the following Evaluation Metrics : [9]

- i) MAE
- ii) RMSE
- iii) R2

**Q3) a) Differentiate between bagging and boosting [4]**

b) What is ensemble learning? Explain the concept of Random Forest ensemble learning. [9]

c) What is the relation between precision and recall? Explain with an example. [4]

**P.T.O.**

OR

**Q4)** a) What is K-fold cross-validation? In K-fold cross-validation, comment on the following situations [9]

- i) When the value of K is too large
- ii) When the value of K is too small.

How do you decide the value of k in k-fold cross-validation?

b) Explain i) Accuracy, ii) Precision, iii) Recall, and iv) F-Score [8]

**Q5)** a) Explain K-Means clustering in detail with a suitable example. [8]

b) What is outlier analysis? How is Local Outlier Factor detected? [5]

c) Explain Spectral Cluster in galgorithm. [5]

OR

**Q6)** a) Explain Hierarchical and Density-based Clustering approaches. [9]

b) Write short note on :

- i) Optimization of clusters
- ii) K-Medoids
- iii) Evaluation metrics

**Q7)** a) Write a note on Single Layer Neural Network. [4]

b) Explain Radial Basis Function networks in detail. [8]

c) Explain Recurrent Neural Networks and its applications in brief. [5]

OR

**Q8)** a) Explain the concept of Back Propagation in ANN with example. [8]

b) What is Functional Link Artificial Neural Network (FLANN)? Explain its merits over other ANNs. [5]

c) What is Activation Function? Explain with a suitable example. [4]

