

Total No. of Questions : 8]

SEAT No. :

PE-2193

[Total No. of Pages : 3

[6584]-92

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) Figures to the right side indicate full marks.
- 3) Draw neat diagram wherever necessary.
- 4) Assume suitable data, if necessary.

- Q1) a) What is R2 measure of evaluation? [6]
 b) Explain the concept of a cost function and its role in Gradient Descent. [6]
 c) What is the primary purpose of the L2 regularization term in the Ridge Regression cost function? [6]

OR

- Q2) a) Describe the bias-variance trade-off and its relationship to underfitting and overfitting. [6]

b)

Month	Amount spent	Sales
Mar-23	13447.45	5750.00
Feb-23	10692.38	44305.00
Jan-23	3067.05	34980.00
Dec-22	200.00	10500.00
Nov-22	12343.18	39154.00
Oct-22	12300.18	23065.00
Sep-22	11960.35	20745.00
Aug-22	9924.53	42000.00
Jul-22	8873.12	5750.00
Jun-22	6383.40	41500.00
May-22	1397.60	13500.00

The table shows advertisement spent and sales figure for 11 months. Predict what would be sales if ad spend is 10800/- using linear regression.

- c) What are different techniques to reduce overfitting? [6]

P.T.O.

- Q3)** a) Explain the basic principles of a Support Vector Machine (SVM). What are support vectors and how does SVM find the optimal hyper plane for classification? [5]
- b) What is Multi Class Classification? Explain the variants of Multi Class Classification. [6]
- c) You have a binary classification model with the following confusion matrix: [6]

True Positives (TP): 120

True Negatives (TN): 45

False Positives (FP): 10

False Negatives (FN): 5

Calculate the accuracy, precision, recall, and F1-score of the model.

OR

- Q4)** a) With suitable diagram, Explain Random forest Algorithm with example. [5]
- b) What are different distance metrics are used in K-NN? [6]
- c) Why ensemble learning is used for ML? [6]

- Q5)** a) What is K-means clustering, and how does it work? Explain the basic principles of this unsupervised machine learning algorithm and its applications. [5]
- b) Why K-medoid is used? Explain K-medoid algorithm. [6]
- c) Define the terms Core point, Border point, Noise point, Eps (ϵ), MinPts (min - samples), Reachability, Density-connected used in the Density-Based Spatial Clustering (DBSCAN) algorithm. [6]

OR

- Q6)** a) What is isolation factor model? [5]
- b) Write short note on following Hierarchical clustering method : [6]
- i) Agglomerative
- ii) Dendrogram
- c) Explain the intrinsic and extrinsic methods for measuring clustering quality. [6]

- Q7) a) Describe the architecture of Artificial Neural Network. [6]
b) Explain the Recurrent Neural Network (RNN) with suitable example. [6]
c) Explain building blocks of RBF networks. [6]

OR

- Q8) a) What is multilayer perceptron? Describe with diagram. [6]
b) Explain the Convolution Neural Network (CNN) with suitable example. [6]
c) What is the role of activation functions in neural networks, and why are they necessary for the network's learning process? [6]

