Total No. of Questions : 8]

SEAT No. :

**P-3151**

[Total No. of Pages : 2

# [6003]-563

## T.E. (Honours in Artificial Intelligence and Machine Learning)

## COMPUTATIONAL STATISTICS

## (2019 Pattern) (Semester - I) (310301)

*Time : 2½ Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, 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) Consider the Confusion Matrix given below. Calculate Accuracy, Recall and Precision. **[9]**

| Predicted class / Actual class | CAT | Not CAT |
|---|---|---|
| CAT | 150 | 10 |
| Not CAT | 20 | 100 |

b) State and explain in depth the typical analysis procedure used in statistical analysis. **[9]**

OR

***Q2)*** a) What is T state? When to use T test? Describe different types of T test in detail. **[10]**

b) What is Sensitivity? Explain Types of Statistical Tests in depth. **[8]**

***Q3)*** a) What are different feature scaling techniques? Explain Normalization and Standardization in depth. **[9]**

b) Differentiate between bias and variance. **[4]**

c) Elaborate the K fold validation method in depth. **[4]**

OR

***P.T.O.***

***Q4)*** a) Differentiate between overfitting and Underfitting. State and explain different methods to avoid overfitting. **[9]**

b) What is regularization? Explain the LASSO (Least Absolute Shrinkage and Selection Operator). Regularization Method. **[8]**

***Q5)*** a) Explain in depth under-sampling and over re-sampling. **[6]**

b) Define Outliers or Anomaly detection. What are different types of Anomaly? Explain different methods to detect Anomaly. **[12]**

OR

***Q6)*** a) Describe Recursive Feature Elimination with example. **[6]**

b) What is Dimensionality reduction? How PCA reduces dimensionality? **[8]**

c) How does the Variance Thresholding is used for Robust Features Selection. **[4]**

***Q7)*** a) Differentiate between linear and logistic regression. **[8]**

b) Explain the Gradient Descent method. State and explain the difference between Batch and Stochastic gradient descent. **[9]**

OR

***Q8)*** a) Describe the Monte Carlo Method in depth with its limitation. State the different real time applications of Monte Carlo Method. **[9]**

b) What is Multilinear Regression? Explain with Multilinear Regression model in details. **[8]**