Total No. of Questions : 8]

SEAT No. :

P-8783

[Total No. of Pages : 2

[6180]-311

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, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Make suitable assumptions whenever necessary.***

Q1) a) List out various methods of statistical analysis ? Explain hypothesis testing, null hypothesis, and alternative hypothesis with example. **[9]**

b) What is confusion Matrix? Explain the True Positive, False Positive, False Negative and True Negative with example. **[9]**

OR

Q2) a) Write short note on **[8]**

i) AUC and ROC

ii) Sensitivity and Specificity

b) Consider the confusion Matrix given below. Calculate Accuracy, Precision, Recall and F-score. **[5]**

Predicted Class / Actual Class	Heart Disease	No Heart Disease
Heart Disease	107	53
No Heart Disease	64	79

c) What is Hypothesis Testing? Comment on type-I and type-II error. **[5]**

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

b) Explain Ridge Regression and Lasso Regression in details. **[8]**

OR

Q4) a) What is bias and variance? Explain bias-variance trade-off with respect to Overfitting and Underfitting. **[8]**

b) Explain three different cross validation Techniques. **[9]**

P.T.O.

Q5) a) What dimension reduction? State few advantages of dimension reduction. Explain any one dimension reduction technique in detail. **[10]**

b) What is imbalance dataset? What are different Resampling Techniques? Explain any one method in depth. **[8]**

OR

Q6) a) Write short note on. **[10]**

i) LDA

ii) PCA

b) What is regression? Explain the Linear and logistic regression in depth. **[8]**

Q7) a) Write short notes on Correlation Coefficient and Rank Correlation. **[8]**

b) Write short notes on Residual Error and Mean Square Error. **[9]**

OR

Q8) a) Explain in detail Linear and Logistic regression with the help of suitable examples. **[8]**

b) Explain the Gradient Descent method. State and explain the different types of gradient descent. **[9]**