

Total Marks 80

(3 Hours)

NB

- 1) Question **number 1** is compulsory
- 2) Attempt **any three** out of the remaining **five questions**.
- 3) Assume suitable data if **necessary** and justify the assumptions.

- Q1 Answer the following 20
- a) What is the difference between data science and data analytics?
 - b) What are Type I and Type –II errors? Give examples.
 - c) Brief about SMOTE.
 - d) What do you mean by Time Series Decomposition?

- Q2 a) Describe the terms: cross-validation, K-fold cross-validation, leave-1 out and Bootstrapping. 10
- b) Explain the data science process in detail. 10

- Q3 a) What are outliers? Explain different outlier detection methods. 10
- b) Calculate the coefficient of correlation for the following data with Karl Pearson’s method. 10

X	10	20	30	40	50	60	70	80	90	100
Y	2	4	8	5	10	15	14	20	22	50

- Q4 a) Find Bowley’s coefficient of skewness of the following series. 10

Size	4	4.5	5	5.5	6	6.5	7	7.5	8
F	10	18	22	25	40	15	10	8	7

- b) Explain the Auto Regressive Integrated Moving Average (ARIMA) model in detail. 10
- Q5 a) Brief about ANOVA and its types. How it is different from a t-test? 10
- b) What is Hypothesis testing? Explain the steps involved in Hypothesis testing with an example. 10

- Q6 **Write a note on any TWO :** 20
- i. Data Visualization techniques
 - ii. Univariate Exploration and Multivariate Exploration
 - iii. House price Prediction or Fraud Detection
