IoUFT-H-DS-TE Sem VI Reg. C'scheme Summer 2025
RCS

Time: 3 Hours **Marks: 80**

N.B. 1. Question No. 1 is compulsory.
2. Attempt any three questions out of remaining five.
3. All questions carry equal marks
4. Assume Suitable data, if required and state it clearly.

1 Attempt **any four**: **20**
- **(a)** What do you mean by random variables? Explain Bayes theorem
- **(b)** Explain Poisson probability distribution with one example.
- **(c)** What is statistical inference?
- **(d)** Discuss in detail Quantitative Data, Descriptive Statistics, Variables, Categorical data, Quantitative Data.
- **(e)** Why is sampling necessary? Describe population and sample mean.

2 **(a)** What is null and alternate hypothesis? Explain type I and type II error? **10**

(b) An agent sells life insurance policies to five equally aged, healthy people. According to recent data, the probability of a person living in these conditions for 30 years or more is 2/3. Calculate the probability that after 30 years: **10**
(a) All five people are still living.
(b) At least 3 people are still living.
(c) Exactly 2 people are still living.

3 **(a)** Explain time series. Discuss Moving averages and Exponential Smoothing. **10**

(b) Differentiate between Simple Linear Regression, Multiple Regression **10**

4 **(a)** What is Logistic Regression? **10**

(b) Find the simple linear regression equation that fits the given data.

Bill	35	118	62	88	100	54
Tip	5	15	10	10	15	5

5 **(a)** You have just taken ownership of a pizza shop. The previous owner told you that you would save money if you bought the mozzarella cheese in a 4.5-pound slab. Each time you purchase a slab of cheese, you weigh it to ensure that you are receiving 72 ounces of cheese. The results of 7 random measurements are 70, 69, 73, 68, 71, 69 and 71 ounces. Are these differences due to chance or is the distributor giving you less cheese than you deserve? **10**
a. State the hypotheses.
b. Calculate the test statistic.
c. Would the null hypothesis be rejected at the 10% level? The 5% level? The 1% level?

(b) Derive Simple Linear Regression parameters to predict the value of the output.

6 **(a)** What do you mean by Sign Test? Explain Wilcoxon Signed-Rank Test. **10**

(b) Explain the following **(any two):** **10**
i. Kruskal-Wallis Test
ii. Scatter diagram
iii. Sample space
iv. Discrete probability distribution