

Semester: June – Sep 24		
Maximum Marks: 50 Examination: ETE Exam Date: 4/11/2024 Duration: 2 Hours		
Programme code: 01 Programme: MBA	Class: FY	Semester/Trimester: I
College: K. J. Somaiya Institute of Management	Name of the department/Section/Center: Business Analytics	
Course Code: 317P01C101	Name of the Course: Business Statistics	
Instructions: 1. All questions are compulsory. There is an internal choice in Question 3. 2. Make suitable assumptions if required and state them. 3. Write all relevant answers and interpretations in your Excel sheet, with sufficient details in an easily readable manner to enable a fast evaluation of your answers. 4. Keep saving the file every ten minutes or so. 5. Make only 1 Excel file with different worksheets pertaining to each question. 6. Name the file with your division no., name and roll number.		

Question No.		Max. Marks
1	<p>A courier service advertises that its average delivery time is less than 6 hours for local deliveries. A random sample of time for 12 deliveries to an address across town was recorded. The data is given in Ques 1 Worksheet in Excel File BS Data Set 1. Is this sufficient evidence to support the courier's advertisement, at the 5% level of significance?</p> <p>a. State the null and alternative hypotheses b. Calculate the test statistic c. State the decision criteria for the given hypotheses d. State the conclusion in the context of the problem</p>	20
2	<p>An electronics manufacturing company produces microchips, each expected to have an average power consumption of 5 watts, with a standard deviation of 0.2 watts. The company regularly monitors the process by taking random samples of chips to ensure the average power consumption remains at 5 watts. Recently, a sample of 100 microchips showed an average power consumption of 4.95 watts.</p> <p>a. Construct 95% and 99% confidence interval estimates for the population mean power consumption. b. Suppose the company decides to increase the sample size to 200 microchips. Calculate the new 95% and 99% confidence intervals for the population mean power consumption using the same sample mean (4.95 watts) and standard deviation (0.2 watts). c. Discuss how the confidence interval changes with an increased sample size.</p>	20 (9+9)+2
3	<p>Despite being a large coffee producer, India is still a predominantly tea-drinking nation, with coffee consumption primarily concentrated in southern states and urban areas where the café culture is more established.</p> <p>The per capita coffee consumption in India remains quite low, with average of 85 grams per year with a standard deviation of 12 grams . (IndiFoodBev)</p> <p>This is significantly lower than in many other countries, where consumption can reach several kilograms per person annually. However, this consumption is expected to grow, and as per Statista it will be doubled by 2027 , driven by increasing café culture and international chains entering the Indian market. Based on the given data answer the following questions.</p> <p>1. What is the probability that coffee consumed is more than 95 grams?</p>	10

2. What is the probability that Coffee consumption lies between 60 grams to 100 grams?

3. What is the probability that the consumption is less than 50 grams?

4. 99% of the people in India consumed less than how many grams of coffee?

OR

a. Differentiate between Standard Deviation and Standard Error.

b. A medical researcher wants to investigate the amount of time it takes for patients' headache pain to be relieved after taking a new prescription painkiller. She plans to use statistical methods to estimate the mean of the population of relief times. She believes that the population is normally distributed with a standard deviation of 15 minutes. How large a sample should she take to estimate the mean time to within 3 minutes with 95% confidence?