SOMAIYA
VIDYAVIHAR UNIVERSITY

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	A company that manufactures plastic chairs has launched a new brand. The company sells through various retail outlets across the country. The management of the company believes that the average price for the new brand is Rs. 550 in all outlets. A researcher wants to verify this claim and has taken a random sample of the selling price of the new brand from 25 outlets across the country. Refer ***Ques 1 Worksheet** in Excel File BS Data Set 3* for selling price. Can the researcher conclude the company's claim is correct at 1% level of significance? 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	20
2	The manager of a pharmaceutical company wants to estimate the actual amount of liquid medicine contained in 500 ml bottles purchased from a well-known manufacturer. It is known from the manufacturer's specifications that the standard deviation of the amount of liquid is 3 ml. A random sample of 50 bottles is selected, and the sample mean amount of liquid per 500 ml bottle is 498 ml. a. Construct a 90% confidence interval estimate of the population mean amount of liquid included in a 500 ml bottle. b. If the standard deviation of the amount of liquid in the bottles were 5 ml instead of 3 ml, construct a 90% confidence interval estimate of the population mean amount of liquid included in a 500 ml bottle. c. Compare the two confidence intervals obtained in parts (a) and (b). How does the change in standard deviation affect the width of the confidence interval? d. Explain how the Central Limit Theorem justifies the use of the normal distribution for constructing the confidence intervals in parts (a) and (b). What role does the sample size play in this justification?	20
3	Travel-by-us is an Internet-based travel agency wherein customers can see videos of the cities they plan to visit. The number of hits daily is a normally distributed random variable with a mean of 10,000 and a standard deviation of 2,400. a. What is the probability of getting more than 12,000 hits? b. What is the probability of getting fewer than 9,000 hits? c. What is the probability of getting hits between 7000 to 13000? d. What hit value corresponds to 50th percentile?	10

| | **OR**

a. Elaborate on the Central Limit Theorem.

b. What 3 critical pieces of information are necessary to calculate sample size for a population with a normally distributed variable of interest (in terms of numbers)? | |