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 mineral water company claims that the average amount of water filled in each of its bottles is 1.108 litres. For verifying this claim, a researcher takes a sample of 25 bottles and measures the quantity of water in each bottle. Refer ***Ques 1 Worksheet*** *in Excel File BS Data Set 5* for quantity of water in each bottle. Can the researcher conclude the company's claim is correct at 5% 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	A manufacturer claims that their new battery lasts an average of 500 hours. To test this claim, a quality control engineer selects a random sample of 40 batteries. The population standard deviation is known to be 15 hours. The data represents the lifespans (in hours) of the sampled batteries (**Excel sheet Q2**). a. Calculate the 90% confidence interval for the true mean lifespan of the batteries. b. Calculate the 95% confidence interval for the true mean lifespan of the batteries. c. Assume the sample mean is found to be 499 hours. Calculate the 90% and 95% confidence intervals and discuss how the width of the confidence interval changes when the mean changes.	20
3	The distribution of the annual incomes of a group of middle-management employees at Compton Plastics approximates a normal distribution with a mean of $47,200 and a standard deviation of $800. a. About 68% of the incomes lie between what two amounts? b. What is the probability income less than $40000? c. What is the probability of income more than $50000? d. What income value corresponds to the top 1 percentile? **OR** a. Differentiate between z and t distribution. b. A normal population has a standard deviation of 15. How large a sample should be drawn to estimate with 95% confidence the population mean to be within 1.5?	10