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| **Semester: NOV-2024**  **Maximum Marks: 50 Examination: End Sem ATKT Exam Date: 30/11/2024 Duration: 2.5hrs** | | |
| **Programme code:18.**  **Programme: MBA for Working Executive** | **Class:** FY | **Semester/Trimester: I**  **Batch - 2023-24 (ATKT-2)** |
| **College:**  **K. J. Somaiya Institute of Management** | **Name of the department/Section/Center:**  Centre for Executive Education | |
| **Course Code:** | **Name of the Course:**  Business Statistics | |
| **Instructions:**   1. **All questions are compulsory.** 2. **Make suitable assumptions if required and state them.** 3. **Use Excel as required and save the file every ten minutes.** 4. **Write all relevant answers and interpretations in Excel with sufficient details to enable a fast evaluation of your answers.** 5. **Create 1 Excel file with different worksheets about each question.** | | |

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| **Question No.** |  | **Max.**  **Marks** |
| 1 | 1. 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.   The per capita coffee consumption in India remains quite low, with average of 85 grams per year with a standard deviation of 12 grams. Assuming that the consumption is normally distributed, answer the following questions.   1. What is the probability that coffee consumed is more than 95 grams? 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. 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? | 5 + 5 |
| 2 | Write a short note on any two:   1. Standard deviation and variance 2. Central Limit Theorem (CLT) 3. Skewness and Kurtosis | 5 + 5 |
| 3 | 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.     1. Construct 95% and 99% confidence interval estimates for the population mean power consumption. 2. Discuss how the confidence interval changes with an increased population standard deviation. | 8 + 2 |
| 4 | The Kentucky Derby is a horse race that has been run every year since 1875 at Churchill Downs in Louisville, Kentucky. The race started as a 1.5-mile race, but in 1896, it was shortened to 1.25 miles because experts felt that 3-year-old horses should not run such a long race that early in the season. Use the output given below to answer the following questions:  A table with numbers and text  Description automatically generated   1. Comment on the shape of the 1.5-mile race and the 1.25-mile race. (6 marks)      1. Compare the performance of the 1.25-mile race with the 1.5-mile race using appropriate descriptive statistics. Speed for which distance is more consistent? (6 marks) 2. What are the limits between which the middle 50% of the 1.25-mile race and the 1.5-mile race were recorded? Also, calculate and interpret the interquartile range. (6 Marks) 3. What is the difference between standard deviation and coefficient of variation? (2 Marks) | 20 |