**Quiz 01 (7293)**

**11.09.2023**

**Full Name: ERP ID:**

**Max. Marks: 15 Time Allowed: 45 Minutes.**

**Q1**. If all possible samples of size 25 are drawn from a normal population with mean equal to 50 and standard deviation equal to 5, what is the probability that a sample mean will fall in the interval from and ? **(03)**

**Q2.** A machine produces metal pieces that are cylindrical in shape. A sample of pieces is taken, and the diameters are found to be 1.02, 0.90, 1.01, 1.03, 0.93, 0.89, 0.95, 1.05, and 1.08 centimeters. Find a 90% confidence interval for the mean diameter of pieces from this machine, assuming an approximately normal distribution**. (05)**

**Q3.** In 2017, the Restaurant Hospitality website reported that only 10% of surplus food is being recovered in the food service and restaurant sector, leaving approximately 1.5 billion meals per year uneaten. Assume this is the true population proportion and that you plan to take a sample survey of 525 companies in the in the food service and restaurant sector to further investigate their behavior. **(1+2.5+2.5+1)**

1. Show the sampling distribution of , the proportion of food recovered by your sample respondents.
2. What is the probability that your survey will provide a sample proportion within 0.03 of the population proportion?
3. What is the probability that your survey will provide a sample proportion within 0.015 of the population proportion?
4. What would be the effect of taking a larger sample on the probabilities in parts (b) and (c)? Why?

***Formulas Sheet***

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