**Quiz 01 (7293)**

**11.09.2023**

**Full Name: ERP ID:**

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

**Q1**. If all possible samples of size 16 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 1.01, 0.97, 1.03, 1.04, 0.99, 0.98, 0.99, 1.01, and 1.03 centimeters. Find a 99% confidence interval for the mean diameter of pieces from this machine, assuming an approximately normal distribution**. (05)**

**Q3.** According to *Reader’s Digest,* 42% of primary care doctors think their patients receive unnecessary medical care. **(1+2.5+2.5+1)**

1. Suppose a sample of 300 primary care doctors was taken. Show the sampling distribution of the proportion of the doctors who think their patients receive unnecessary medical care.
2. What is the probability that the sample proportion will be within 0.03 of the population proportion?
3. What is the probability that the sample proportion will be within 0.05 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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