Quiz -1 (A)

Name:_____ Roll:_____ Sign:_____

Instructions

1. You have 45 minutes to answer all the questions in the space provided in the question paper.
2. Switch off your electronic devices and put them in your bag or pocket.
3. Please read all questions carefully before writing your answers. If you have any questions, do not discuss them with your neighbours; raise your hand we will come to you.

All The Best!

1. As per a poll, 63.5% of engineering students in the Delhi NCR had a driver's license. A sociologist wants to check if this rate has declined. The sociologist surveys 700 randomly selected high school seniors and finds that 350 have a driver's license. [2 marks]
   Pick the correct null hypothesis.

☐ **$p \geq 0.635$**	☐ $q = 0.5$	☐ $q \geq 0.635$	☐ $p = 0.5$

   Pick the correct alternative hypothesis.

☐ $p > 0.635$	☐ $q < 0.5$	☐ **$p < 0.635$**	☐ $q \neq 0.635$

   Here, p is the population proportion, i.e., probability of high school seniors in the entire Delhi NCR that have a driver's license and q is the sample proportion i.e., probability of high school seniors in the sociologist's random sample that have a driver's license.
2. What is the null hypothesis and alternative hypothesis for a right tailed test? [2 marks]
   - ☐ $H_0: \mu \geq \mu_0$ & $H_1: \mu < \mu_0$
   - ☐ **$H_0: \mu \leq \mu_0$ & $H_1: \mu > \mu_0$**
   - ☐ $H_0: \mu > \mu_0$ & $H_1: \mu = \mu_0$
   - ☐ $H_0: \mu = \mu_0$ & $H_1: \mu \neq \mu_0$
3. What are the measures of central tendency? [2 marks]

☐ **Mean**	☐ Variance	☐ Interquartile range	☐ Standard Deviation

4. Which of the following technique is used to handle missing values. [2 marks]

☐ **Data Imputation**	☐ Data Transformation	☐ Data Normalization	☐ Data Smoothing

5. Your friend gives you a coin. He calls it a magic coin by claiming that it is biased towards flipping heads. To test his claim, you started tossing coin. Select the correct option, due to which you end up rejecting your null hypothesis. [2 marks]
   - ☐ It flips heads with a probability of 0.55 for a small number of random tosses.
   - ☐ It flips tails with a probability of 0.55 for a small number of random tosses.
   - ☐ **It flips heads with a probability of 0.55 for a large number of random tosses. (If no assumption is stated for this question or null hypothesis (H_0): coin is unbiased) (Give full marks)**
   - ☐ **It flips tails with a probability of 0.55 for a large number of random tosses. (Only if null hypothesis (H_0): coin is biased) (Give 1 mark)**
6. To test if a coin is biased or not you want to conduct a z-test. You set your hypothesis as $H_0: \mu = 0.5$ & $H_1: \mu \neq 0.5$. Based on your null hypothesis, over expectation how many tosses will you conduct to have a sample set with at least 15 heads and 15 tails? [5 marks]

Define geometric random variable