Multiple-Choice Questions

1. What is the primary purpose of defining the **business context** before running an A/B test?
   A) To create a marketing strategy
   B) To understand the environment and problem being solved
   C) To increase sample size
   D) To ensure randomness in data collection
2. Which of the following is an example of a **primary goal** in an A/B test?
   A) Reducing customer support tickets
   B) Increasing checkout conversion rate
   C) Improving brand reputation
   D) Adding new product features
3. What is the **hypothesis statement** used for in an A/B test?
   A) To define the change being tested and expected outcome
   B) To track user behavior changes over time
   C) To ensure the sample size is large enough
   D) To determine statistical significance
4. Which of the following **is NOT** a type of sampling method?
   A) Simple Random Sampling
   B) Convenience Sampling
   C) Predictive Sampling
   D) Cluster Sampling
5. Why do we use **guardrail metrics** in A/B testing?
   A) To determine the effectiveness of a test
   B) To measure unintended negative impacts
   C) To increase sample size
   D) To improve engagement rates
6. What is the key reason for **random assignment** in an A/B test?
   A) To ensure groups are comparable and minimize bias
   B) To test multiple variations at once
   C) To track every user in the experiment
   D) To ensure statistical significance is always achieved
7. What is the **minimum detectable effect (MDE)** in an A/B test?
   A) The largest effect an experiment can detect
   B) The smallest effect worth detecting for a business decision
   C) The number of users needed to detect an effect
   D) The probability of a Type I error occurring
8. Why do we conduct **A/A testing** before an A/B test?
   A) To check for statistical significance before launching the real test
   B) To validate that randomization and instrumentation are working correctly
   C) To compare two different variations of a product
   D) To collect user feedback on the experiment

9. What is a **p-value** used for in an A/B test?
   A) To measure the effect size of a change
   B) To determine if the observed difference is statistically significant
   C) To define the null hypothesis
   D) To track how many users completed the experiment
10. What is the purpose of **segment analysis** in A/B testing?
    A) To analyze only the control group
    B) To identify if different user groups respond differently to the change
    C) To determine how long the test should run
    D) To test multiple features at once

True/False Questions

11. A/B testing is only useful for improving website performance.
12. A well-defined hypothesis ensures that the experiment is clear, testable, and actionable.
13. Guardrail metrics are used to monitor negative side effects of an experiment.
14. The Central Limit Theorem states that a large enough sample size will always result in a normal distribution.
15. Random assignment helps ensure that differences between groups are due to the experiment and not external factors.
16. A test with a p-value of 0.02 means that there is a 98% probability that the new variation is better.
17. A phased rollout strategy involves launching the new feature to 100% of users immediately.
18. Statistical power $(1-\beta)$ refers to the probability of detecting a true effect if one exists.
19. A poorly defined sample size can lead to misleading A/B test results.
20. The novelty effect occurs when users temporarily change their behavior due to a new feature being introduced.