Answer any 10 questions.   (1x10)

1. Distinguish between Population and Sample.

2. Fill in the blank;
   Population mean is denoted by _ and Sample mean is denoted by _.

3. What is Type II Error?

4. What is the null hypothesis and alternative hypothesis for the following situation:

   Last year, one company's service technicians took an average of 3.2 hours to respond to trouble calls from business customers who had purchased the service contracts. They want to know if this year's data show a different average response time.

5. Select the correct option:
   We reject the null hypothesis when the observed value of test statistic
   (a)   falls in the critical region, (b) falls in the non-rejection region,
   (c)   when probability of type 1 error is 0.5, (d) when p value is 0.2.

6. What is power of a test?

7. To test for the difference of two population means when the samples are dependent, which test statistic you will use and what distribution does it follow?

8. Write down the pdf of F-distribution.

9. What are the properties of good estimators?

10. If Θ is a parameter and T an estimator such that $E(T) = 6\Theta$, then give an unbiased estimator of Θ.

11. Which one of the following is an example of a point estimate?

    (i) the population mean

    (ii) the population variance

    (iii) the population standard deviation

(iv) the sample mean

12. Which statement is not true about the 95% confidence level?

A. Confidence intervals computed by using the same procedure will include the true population value for 95% of all possible random samples taken from the population.

B. The procedure that is used to determine the confidence interval will provide an interval that includes the population parameter with probability of 0.95.

C. The probability that the true value of the population parameter falls between the bounds of an already computed confidence interval is roughly 95%.

D. If we consider all possible randomly selected samples of the same size from a population, the 95% is the percentage of those samples for which the confidence interval includes the population parameter.

13. Write down the advantage of CRD method.

14. What do you know about experimental unit?

15. What are the assumptions for hypothesis testing?