**BUS 322 S22 Quiz 3**

**Definitions and Notes**

**as of 4/12/22**

**1. One-Way Analysis of Variance:** An analysis of variance design in which independent samples are for the purpose of testing whether they have equal means. A statistical procedure for testing differences the means of multiple populations. It requires for the following to be calculated: the degrees of freedom, the critical value, and the test statistic.

**2. ANOVA Assumptions for Experimental Design:**

a) the populations follow the normal distribution

b) the populations have equal standard deviations

c) the observations are independent

**3. The F-distribution:** It is used to test whether two samples are from populations having equal variances, and it is also applied when we want to compare several populations means simultaneously. The samples are randomly and independently selected. It a sampling distribution composed of sample variance ratio.It is skewed to the left and it becomes closer to the normal distribution as the number of degrees of freedom increases.

**4. F test :** a hypothesis test using the F distribution. It is used to calculate whether two independent populations have the same variability. It uses the ration of the variances of two samples that have been selected randomly from the same population or from two normally distributed populations with the same variability.

**5. Characteristics of F-distribution:**

a) there is family of F distribution

b) it is continuous

c) cannot be negative

d) it is positively skewed.

e) it is asymptotic. As the values of X increase, the F curve approaches the X-axis but never touches it.

**6. ANOVA Table :** a table format for presenting the elements of an F test.

**7. One-tailed test: :** a hypothesis test in which rejection of Ho occurs for values of the test statistic in one tail (upper or lower) of its sampling distribution

**8. Two-tailed test:** a hypothesis test in which rejection of Ho occurs for values of the test statistic in either tail of its sampling. There are two tails, the upper and the lower. For each tail use α/2 as the level of significance. The formulas TINV or NORMSINV can be used to calculate the critical values.

**9. t-distribution:** A family of probability distributions that can be used to develop an interval estimate of a population mean whenever the population standard deviation is unknown and is estimated by the sample standard deviation.

**10. Degrees of Freedom:** A parameter of the t-distribution. It consists of the number of independent data values available to estimate the value of $Σ$ of population It can be calculated either by using the “n-k” or “n-1” depending on the problem at hand.

**11. Hypothesis:** A statement about a population parameter subject to verification.

**12. Hypothesis Testing:** A procedure based on sample evidence and probability theory to determine whether the hypothesis is a reasonable statement. Same as Research Hypothesis. Some steps of the process are; define Ho, define Ha, select α.

**13. Null Hypothesis:** Ho is a statement about the value of a population parameter developed for the purpose of testing numerical evidence. Always contains the equal sign. The Ho will not be changed unless there is a sufficient evidence to do so.

**14. Alternate Hypothesis:** Ha is a statement that is accepted if the sample data provide sufficient evidence that the null hypothesis is false. It never contains the equal sign. The Ha is also called the Research Hypothesis.

**15. Level of Significance:** The probability of rejecting the null hypothesis when it is true. It is represented by the symbol α.

**16. Type I Error:** Rejecting the Null Hypothesis when it is true.

**17. Type II Error:** Accepting the Null Hypothesis when it is false.

**18. Test Statistic:** A value, calculated from sample information necessary for determining whether there is enough evidence to reject Ho. This will always be one number.

**19. Critical Value:** The dividing point between the region where the null hypothesis is rejected and the region where it is not rejected. One-tailed test will have one critical value, two tailed test will have two critical values

**20. Large sample:** n ≥ 30. If you know the value of $Σ$ and the sample size is large use the z distribution.

**21. p-value:** it is an observed significance value, it is not the probability that the Ho is true, it**.** It is a part of the analysis of proportions.

**22. Students distribution:** it is also called the t-distribution. It is a form of distribution indexed by its degrees of freedom. This distribution is unimodal, symmetrical, and bell-shaped. As the number of degrees of freedom increase, the t-distribution approaches the shape of a z-distribution.

**23. Sampling distribution**: is a distribution of the possible values of statistics for a given size of a random sample selected from the population.

**24. Chi-square distribution:** can be used to conduct a test to determine whether sample data that were collected “ fit a particular model of distribution. It is called a “goodness of fit” model. It can also be used to determine whether certain factors represented in the sample data are statistically independent.: