AS1(Assignment 1, Unit 5) Independent Measures t-test

Please write your responses in red ☺

A pharmaceutical company wishes to test the effects of a herbal supplement on anxiety levels. The researcher randomly selects a sample of n=16 adults from Essex County. The sample is randomly assigned to either the herbal supplement, Group B or a placebo, Group A.
Here are the data:

GROUP "A"	GROUP " B "
12, 16, 18, 21,	13, 18, 20, 16
17, l8, l8, 19	19, 21, 19, 22

l. What is the researcher's hypothesis?
The herbal supplement has an effect on anxiety levels.

2. What is the null hypothesis?
The herbal supplement has no effect on anxiety levels.
3. What is the independent variable?
The herbal supplement

4. What is the dependent variable?
The anxiety level

5. What is the name of the ***research design*** in this study?
Between-subject research design
6. What is the appropriate ***hypothesis test*** to analyze the data from this study?
Independent Measures T-test

7. What are the two mean "differences" you are analyzing in these data?
The two mean "differences that I am analyzing in these data is the difference between the means that the researcher can credit to the independent variable. The other difference I analyzed is the difference between the means that was random or that happened just by chance.
8. What is the definition of a random assignment?
The definition of random assignment is that everyone in the population has an equal chance to be selected for the sample.

9. Why is using a random sample important in this study?
Using a random sample is important in this study because researchers want to study populations, but they can't study populations directly so they study samples. So a random sample is important because it allows the researcher to assume that the sample represents. This assumption is what allows the researcher to be able to "generalize" the results of a study conducted on a sample back to the population.

10. If a researcher failed to use random assignment, how would this affect the research conclusion?
If a researcher failed to use random assignment they could not assume that the only difference between the groups is the independent variable. Also failing to use random assignment the researcher can not credit the cause to the independent variable.

11. If a researcher failed to use a random sample, how would this affect the research results?
If a researcher failed to use a random sample, it would affect the research results by possibly becoming biased and also the data probably would not be representative of the population.

12. Run the appropriate SPSS analysis on the data and cut and paste your SPSS results here:

Group Statistics

	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	1.00	8	17.3750	2.61520	.92461
	2.00	8	18.5000	2.87849	1.01770

Independent Samples Test

		Levene's Test for Equality of Variances	t-test for Equality of Means								
						Significance	Mean Difference		95% Confidence Interval of the Difference		
		F	Sig.	t	df	One-Sided p	Two-Sided p	Std. Error Difference	Lower	Upper	
VAR00001	Equal variances assumed	.149	.705	-.818	14	.213	.427	-1.12500	1.37500	-4.07408	1.82408
	Equal variances not assumed			-.818	13.873	.214	.427	-1.12500	1.37500	-4.07661	1.82661

13. Based on your SPSS results, please answer the following questions:

(a) What is the appropriate decision, reject the null or fail to reject the null? Fail to reject the null hypothesis .
(b) Write the "statistical statement" of your SPSS analysis: $t(14)=-0.818, p<.05$
(c) Please write your results as they might be written in a research study (refer to the "In the Literature" section of chapter lo of your textbook).
The mean of Group A was M=17.3750 with a SD=2.61520. The mean for Group B was M=18.5000 with a SD=2.87849. There was not a significant difference between the groups and we failed to reject the null hypothesis. The statistical statement of the results is $t(14)=-0.818, p<.05$. To conclude, the mean anxiety levels were equal in both Group A and Group B.

(d) Is there a probability of Type I error? No
(e) Is there a probability of Type II error? Yes