AS4 (Assignment 4, Unit 5)

SECTION I:

A randomized study on n=50 rats tested whether living in a crowded situation had an effect on stress levels. Based on this information, please answer questions 1-6

1. What is the researcher's hypothesis?
Rats living in a crowded situation WILL have an effect on stress levels.

2. What is the null hypothesis?
Rats living in a crowded situation will NOT have an effect on stress levels.

3. What is the independent variable? Crowded situation.

4. What is the dependent variable? Stress levels.

5. What research design appears apparent here? Between-Subjects design.

6. What is the appropriate hypothesis test? Independent Measures t-test.

A researcher wishes to know whether a newly developed teaching method has an effect on 5th grading reading scores. A sample of 5th graders are given a standardized test at the beginning of the school year and retested at the end of the school year. Based on this scenario, answers questions 7-12.

7. What is the researcher's hypothesis?
The new teaching method WILL have an effect on 5th-grade reading scores.

8. What is the null hypothesis?
The new teaching method will NOT have an effect on 5th-grade reading scores.

9. What is the independent variable? New teaching method.

10. What is the dependent variable? Reading scores.

11. What is the name of the "research design? Within-Subject design.

12. What is the appropriate hypothesis test to analyze the data from this study?
Independent Measures t-test

SECTION II:

13. What is the definition of a random sample?

A random sample is when everyone in the population has an equal chance to be selected for the sample.

14. What is the definition of random assignment?

Random assignment can be defined as everyone in the sample having an equal chance of being put into the control group or the experimental group.

15. Imagine that the researcher failed to use a random sample. How would this failure limit her study's conclusions?

If a researcher fails to use a random sample, it would limit her study's conclusion because she is cannot assume the sample represents the population, and her results can't generalize the population. She will not be able to say that what was true of the sample findings is also true of the population.

16. Imagine that the researcher failed to use random assignment in her study. How would this limit her research conclusions?

If a researcher fails to use random assignment in her study, her research conclusions are limited because, if the researcher doesn't use random assignment, then the researcher cannot assume that the only difference between the groups is the independent variable. The researcher cannot attribute the cause to the IV, which fails to showcase a cause-and-effect relationship between the IV and the DV.

17. No matter what hypothesis test you are using, there are two basic "differences" that you are analyzing in ALL hypotheses tests. What are these two "differences"?

l. The alternative hypothesis

2. The null hypothesis.

18. What is meant by the term "statistical significance"?

If the p-value of data is less than the alpha level.

SECTION III:

A researcher tested whether drinking caffeine had an effect on anxiety. Below is an SPSS printout from an "independent measures t-test for the data he collected:

Group Statistics

	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	1.00	6	4.8333	1.16905	.47726
	2.00	6	8.3333	.81650	.33333

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
VAR00001	Equal variances assumed	.537	.481	-6.012	10	.000	-3.50000	.58214	-4.79709	-2.20291
	Equal variances not assumed			-6.012	8.940	.000	-3.50000	.58214	-4.81824	-2.18176

19. Please write the "statistical statement" for the above SPSS results:

Answer: t (10) = -6.012, p<.05

20. What decision did you make at end of this test? Reject Ho

21. Are the data significant? Yes X or No _____

22. Please write up the complete results for the above test:

The mean for the group drinking no caffeine was M = 4.83 with an SD = 1.16. The man for the group who drank caffeine was M= 8.33 with an SD = .816. Our data support that caffeine did have an effect on anxiety, t(10)=-6.012,p<.05. With a Type I probability.

A researcher tested whether a particular lecture would have an effect on motivation.
Below is an SPSS printout of a Paired Samples Test she used to analyze her data:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	VAR00001	4.1250	8	1.45774	.51539
	VAR00002	5.0000	8	2.00000	.70711

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	VAR00001 - VAR00002	-.87500	2.10017	.74252	-2.63079	.88079	-1.178	7	.277

22. Please write the "statistical statement" for the above SPSS results:

Answer: t(7) = -1.178, p>.05

23. Did you reject or fail to reject the null hypothesis? Fail to reject the null hypothesis.

24. Is this a within or between-subject design? Within-Subject design

25. Are the data significant? Yes_____ No X

26. Is there a probability of Type I Error? Yes_____ No X

27. Please write up the research results for the above:

The mean of motivation **before** the lecture was M = 5.0 with an SD = 2.0. The mean of motivation **after** the lecture was M = 4.12 with an SD = 1.45. Our data is not significant. Our data support that a particular lecture does NOT have an effect on motivation t (7) = - 1.178, p>.05. Type II probability.