Biol 570 **Lab #11 Worksheet**

Name: _____ **Sorting Number: _____**

Lab Day: _____ **Lab Time: _____**

Fill in the worksheet as you go through the steps and submit it to your TA at the end of class.

Part 1: Paired *t*-test – Mosquitoes and malaria.

Question 1. What are the appropriate the null and alternative hypotheses for this experiment?

H_0:

H_A:

Question 2. If we find evidence that the difference is a positive number, what will our biological conclusion of the evidence be?

Question 3. What do you conclude about whether or not malaria infection makes a person more attractive to mosquitoes?

Question 4. Did you get the same result when you performed the paired t-test this way?

Part 1: Two-sample *t*-test – London taxi driver study

Question 5. What are the appropriate null and alternative hypotheses?

H_0:

H_A:

Question 6. Are these data paired (can we use a paired t-test)?

_____

Question 7. Based on the scatterplot, do you think that we will find a significant difference in the size of the hippocampus between those drivers with < 15 years experience and those with > 15 years experience?

Question 8. Use the summary statistics that you displayed to calculate a t-statistic for the difference in means for the posterior hippocampus (comparing the difference to an expected value under the null of zero). What is the value of the t-statistic?

$$t = \frac{\overline{Y}_1 - \overline{Y}_2 - (\mu_1 - \mu_2)_0}{SE_{\overline{Y}_1 - \overline{Y}_2}}$$

$$SE_{\overline{Y}_1 - \overline{Y}_2} = \sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}$$

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

Question 9. Use the t-table at the end of this lab handout to calculate a P-value for this test statistic. What is the appropriate value for the degrees of freedom, and what is the range of P-values that you get?

df = _____

P-value: _____

Question 10. Which population mean did you substract in order to calculate the t-statistic? If you were to get a positive value for the difference in means, what would this indicate biologically? (Would it appear that taxi driving increased or decreased the size of the posterior hippocampus?)

Question 11. What is the P-value reported by Minitab? P-*value* = _____

Question 12. What should we conclude from this study?

Question 13. Are the results similar to what was found earlier for the posterior hippocampus? What is the P-value for this comparison?

P-*value* = _____