BIOL 570 Lab #10 worksheet

Name: _____   **Sorting #:** _____

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 2: 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 boxplot, 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?

$$
\begin{aligned}
t &= \frac{\bar{Y}_1 - \bar{Y}_2 - (\mu_1 - \mu_2)_0}{SE_{\bar{Y}_1 - \bar{Y}_2}} \\
SE_{\bar{Y}_1 - \bar{Y}_2} &= \sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)} \\
s_p^2 &= \frac{(n_1 - 1)\, s_1^2 + (n_2 - 1)\, s_2^2}{n_1 + n_2 - 2}
\end{aligned}
$$

Question 9. What is the critical value that R reported?

Question 10. Which population mean did you substract in order to calculate thestatistic? 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?)

0.5cm Question 11. What is the P-value reported by R?

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?