

# MTH 3240 Lab 7 Answer Sheet

Due Thu., Mar. 12

## 1 Part A

### 1.1 Clear-Cutting and Water Quality Data Set

1. NA
2. *Don't* print the boxplots. Just answer the following question.

Judging from the side-by-side boxplots, which site, if any, **upstream** or **downstream**, do you think has higher nitrate concentrations? .....

3. For the *paired t test*, give the following values and answer the question.

The paired  $t$  test statistic value is  $t =$  .....

The p-value = .....

Is the result statistically significant using  $\alpha = 0.05$  (Yes/No)? .....

What does this indicate about whether clear-cutting has any effect on the nitrate concentration (Does/Doesn't)? .....

4. Give the values of the endpoints of the *confidence interval* below, and then answer the question.

Based on the confidence interval, is it plausible that the true mean difference (effect size) is zero? Explain.

5. *Don't* print the histogram. Just answer the following question.

Does the histogram support the assumption required for the *paired t test* that the differences are a sample from a **normal** distribution (Yes/No)? .....

6. Did you get the same result, when you carried out a *one-sample t test* on the **differences**, as the result you got when you carried out a *paired t test* on the **lab** and **field** counts (Yes/No)? .....

## 2 Part B

### 2.1 Hospital Bacteria Failure Rates Data

1. NA
2. *Don't* print the boxplots. Just answer the following question.

Judging from the side-by-side boxplots, which of two periods, **before** cleaning or **after**, do you think has higher bacteria failure rates? .....

3. For the *signed rank test*, give the following values and answer the question.

The signed rank test statistic value is  $V =$  .....

The p-value = .....

Is the result statistically significant using  $\alpha = 0.05$  (Yes/No)? .....

What does this indicate about whether the routine cleaning reduces the failure rate (Does/Doesn't)? .....