MATH108 10FA Midterm ch7-11 A
[ answers in web view ] Total points: 70

Name:_____
Student ID:_____

> Let the words of my mouth and the meditation of my heart
> Be acceptable in Your sight, O LORD, my Rock and my Redeemer.
> -- Psalm 19:14

- Please show all your work! No partial credit will be given for incorrect answers with no work shown.
- Please draw a box around your final answer.
- You are only permitted to use your own calculator and writing implements. Cell phones should be muted and left in your pocket or bag.
- All relevant tables are attached to the back. You may detach them for your reference.
- Assume $\alpha = 0.05$ everywhere unless indicated otherwise.
- For t-tests on two groups, if the df is not given, you may use the conservative estimate of $df = \min(n_1, n_2) - 1$.

1. Are nurses who work in the ER (emergency room) and nurses who don't work in the ER equally likely to be taking prescription anti-depressants (ATD)? The number of participants in each category is listed in the table below.

| | ATD | No ATD |
|---|---|---|
| ER | 42 | 48 |
| Non-ER | 30 | 60 |

(a) What is the **population** of interest? [1]

(b) Name the **variable(s)** which need to be measured, indicate their levels of measurement, and whether each is a predictor or outcome variable. [2]

(c) State the null and alternate **hypotheses**, both in words and in appropriate notation. Which statistical test(s) would be appropriate? [3]

(d) Run the appropriate test and bracket a ***p*-value**. [4]

(e) State the **conclusion** from this test, and interpret it in the context of the original research question. [2]

2. Does workplace (defined as "hospital", "clinic", or "community") affect nurses' hourly wage?

   (a) What is the **population** of interest? [1]

   (b) Name the **variable(s)** which need to be measured, indicate their levels of measurement, and whether each is a predictor or outcome variable. [2]

   (c) What is the appropriate parametric statistical **test** to run? [1]

   (d) State the null and alternate **hypotheses**, both in words and in notation. [2]

   (e) Data for this experiment are given below. **Run** an appropriate test and bracket the *p*-value. [5]

| | | | |
|---|---|---|---|
| **Hospital:** | 27 | 30 | 33 |
| **Clinic:** | 30 | 34 | |
| **Community:** | 26 | 30 | |

   (f) State the **conclusion** from this test, and interpret it in the context of the original research question. [2]

   (g) What are the **assumptions** of the statistical test you performed? Is there evidence to suggest that any of these assumptions have been violated in this dataset? [4]

3. Suppose we wish to determine whether the location of birth (in hospital or at home) has an impact on birth weight (in kg).

(a) Name the **variable(s)** which need to be measured, indicate their levels of measurement, and whether each is a predictor or outcome variable. [2]

(b) State the null and alternate **hypotheses**, both in words and in appropriate notation. Which statistical test(s) would be appropriate? [3]

(c) Data for this experiment are given below. Run an appropriate **parametric** test and bracket the *p*-value. [5]

| | | | | | | | | | **Mean:** | **SD:** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Hospital:** | 3.7 | 3.2 | 4.4 | 4.8 | 5.1 | 4.7 | 2.9 | 3.2 | 4.0 | 0.8519 |
| **Home:** | 3.7 | 2.7 | 4.0 | 2.8 | 3.2 | 3.1 | 2.9 | | 3.2 | 0.4830 |

(d) State the **conclusion** from this test, and interpret it in the context of the original research question. [2]

(e) Using the same data, perform an appropriate **non-parametric** test and bracket the *p*-value. [4]

(f) State the **conclusion** from this test, and interpret it in the context of the original research question. [2]

(g) Which test do you think is more **appropriate** for this data, the parametric or the non-parametric test? Why? [2]

4. Do wives wash hands more frequently than their husbands do? Six couples were asked how many times per day they wash their hands; the results are in the table below.

| | | | | | | | Mean | SD |
|---|---|---|---|---|---|---|---|---|
| **Wife:** | 3 | 7 | 8 | 7 | 8 | 9 | 7 | 2.098 |
| **Husband:** | 7 | 3 | 3 | 3 | 3 | 5 | 4 | 1.673 |

(a) What is the **population** of interest? [1]

(b) Name the **variable(s)** which need to be measured, indicate their levels of measurement, and whether each is a predictor or outcome variable. [2]

(c) State the null and alternate **hypotheses**, both in words and in appropriate notation. Which statistical test(s) would be appropriate? [3]

(d) Run an appropriate **parametric** test and bracket the *p*-value. [5]

(e) State the **conclusion** from this test, and interpret it in the context of the original research question. [2]

(f) Using the same data, perform an appropriate **non-parametric** test and bracket the *p*-value. [4]

(g) State the **conclusion** from this test, and interpret it in the context of the original research question. [2]

(h) Which test do you think is more **appropriate** for this data, the parametric or the non-parametric test? Why? [2]