HW #5 Stat 411/511 Winter 2012

1.

Group	Responses	Order	Rank
T	4	1	1.5
C	4	2	1.5
T	6	3	3
C	8	4	4
C	9	5	5

↑
1 pt

Wilcoxon Rank Sum Statistic, T = sum of ranks in smallest group

= sum of ranks in Treatment group

= 1.5 + 3

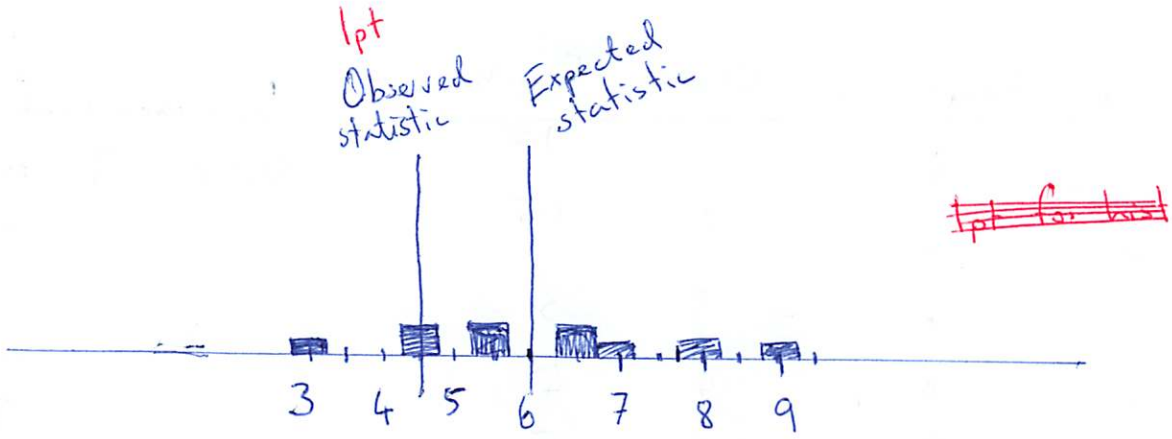
T = 4.5 1 pt

2.

Possible Treatment Gp	Possible Control Group	T
4, 4'	6, 8, 9	~~4~~ 3
4, 6	4', 8, 9	4.5
4, 6	4, 8, 9	4.5
4, 8	4', 8, 9	5.5
4', 8	4, 8, 9	5.~~5~~
4, 9	4', 8, 9	6.5
4', 9	4, 8, 9	6.5
6, 8	4, 4', 9	7
6, 9	4, 4', 8	8
8, 9	4', 4, 6	9

2 pts

3.



has mean $n_1 \bar{R} = 2 \times (\quad + 5)/12 = 6$ 1pt

1pt

4. Only 3 and 4.5 are as small or smaller, they occur in a total of 3 groupings.

$$\text{p-value} = \frac{3}{10} = 0.3$$ 1pt

1pt

5. There is no evidence that the treatment reduces the response (Wilcoxon Rank Sum test, exact one-sided p-value = 0.3)

1pt

Extra: For a two-sided p-value we need to count the ways, T, could be further from the expected value of 6. A T of 3, 4.5, ~~XX~~, 8 or 9 would all be as far or farther from 6 than our observed value of 4.5. These occur in a total of ~~XX~~ 5 groupings, so the two-sided p-value is ~~XXXXXX~~ 0.5 .