Student: _____

GRADING KEY

_____ **PROCEDURE NOTEBOOK** [5]

_____ **Part A** [28]

_____ **Part B** [50]

1. *Two groups*

a. ____ stem
____ leaves Group 1
____ leaves Group 2

```
Group 1   Group 2
       0|1|
        |2|
       0|3|000
      00|4|000
 000000|5|000
       (x10) <- multiplier optional
```

b. ____ Describe the shape of the Group 1 distribution: negative skew
c. ____ Describe the shape of the Group 2 distribution: symmetrical, uniform.
d. ____ Identify outliers, if any. Group 1 has a low outlier.
e. ____ Median of Group 1 = 5
f. ____ Median of Group 2 = 4

2. *F ratio test*

a. ____ H_0: sigma-squared-1 = sigma-squared-2
b. ____ Area to right of 3.99 is shaded
c. ____ Landmark of 3.18 is shown
d. ____ Yes, $p < .05$
e. ____ Heteroscedasticity

3. *Mean and standard deviation*

a. ____ mean = 100
b. ____ SS = 200
c. ____ $s = 7.0711$
d. ____ The standard deviation should be reported as either 7.07 or 7.1.

4. *More monkey data*

a. ____ pooled estimate of variance = $\frac{(4)(7.071^2)+(5)(6.782^2)}{4+5} = 47.775$

____ standard error = $\sqrt{47.775(\frac{1}{5}+\frac{1}{6})} = 4.18$

b. ____ The *precision* of the difference estimate
c. ____ H_0: mu1 = mu2
d. ____ t_{stat} =–3.11, df = 9, p = .013
e. ____ Yes, the difference is significant.
f. ____ No, there is no good evidence that population variances differ
____ The sample standard deviations are similar (7.1 vs. 6.8)
____ Levene's test p = .96

5. *Bud's fascination with monkeys continues*

a. ____ H_0: mu1 = mu2 = mu3 [half credit for H0: mu1 = m2 = ... = mk]
b. ____ H_1: at least one mu_i differs
c. ____ $df_B = 2$
d. ____ $s^2_B = 236.867$
e. ____ $df_w = 12$
f. ____ $s^2_w = 41.500$
g. ____ $F_{stat} = 5.708$
h. ____ p = .018 (or $p < .05$)
i. ____ Reject the null
j. ____ Significant, yes.
k. ____ To keep the family-wise error level at a reasonable level.
l. ____ The only significant difference is between groups 1 and 2.

6. *Correlation and regression*

a. ____ outlier in the upper right quadrant
____ Lack of a clear correlation. An answer of "slight positive correlation" will be accepted *if* carefully nuanced and outlier is removed
b. ____ No, correlation is not warranted.
c. ____ no outliers
____ linear positive correlation [1]
d. ____ Yes, correlation is warranted.
e. ____ Linearity, Independence, Normality, Equal variance
f. ____ Good information, Good sample, No confounding
g. ____ For every unit increase in X, the model predicts an increase of 5.448 in Y
h. ____ $5.448 \pm (t_{5,.975})(1.184) = 5.448 \pm (2.57)(1.184) = 5.44 \pm 3.04$
____ = (2.40, 8.48)
i. ____ 95% confident parameter β . . .