

Review Questions and Practice Problems

PART A (ANSWERS PROVIDED IN APPENDIX C)

Use the following data to answer questions 1–10 in PART A and 11–13 in PART B. Use an alpha level of .05.

Control	Treatment A	Treatment B
1	2	3
2	4	6
3	6	9

1. What are the three means?
2. What is the grand mean?
3. What is the null hypothesis?
4. What is the critical value of F required to reject the null hypothesis?
5. What is your conclusion regarding the null hypothesis?
6. What type of error is possible with this conclusion?
7. What is the grand mean?
8. What is the null hypothesis?
9. What is the critical value of F required to reject the null hypothesis?
10. What is your conclusion regarding the null hypothesis?
11. What type of error is possible with this conclusion?

Using the *definitional* formulas, calculate the F -ratio for these data.

4. What are the SS_T , SS_B , and SS_W ?
5. What are the degrees of freedom for each sum of squares?
6. What are the MS_B and MS_W ?
7. What is the F -ratio?

PART B

11. Using the raw score formulas with these data, calculate the sums of squares and then construct a source table for the ANOVA.

Now, enter the data above into SPSS and use **Analyze→Compare Means→One-Way ANOVA** to confirm the results you obtained in questions 1, 2, 4, 5, 6, 7, and 11.

12. What multiple comparison technique would be appropriate for the results of this ANOVA?

13. Suppose the investigator for this study decided before the data were collected that she would only compare each of the treatment means to the control mean, and assume she wants to be very sure she does not commit a Type I error. How would she answer the three questions given in the chapter that guide the choice of multiple comparison test?

16. With Scheffé, which means are significantly different?

17. With Tukey, which means are significantly different?

Use the following information to calculate the Scheffé and Tukey values and the answers to questions 14 through 18. Use $\alpha = .05$.

- $k = 6$
- $n = 60$ (equal number of subjects in each group)
- The six means (in order) are: 10, 11, 12, 13, 14, 20.
- $F\text{-ratio} = 12$
- $MS_B = 84$

18. At $\alpha = .05$, is there a difference between the average of the first three means and the average of the last three means?

14. What is the value required for significance, with Scheffé?

15. What is the value required for significance, with Tukey?

