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1. If F_{DATA} follows an F distribution with df_1=4 and df_2=5, what is the boundary value of F where $P(F_{DATA} < F) = 0.95$?
   a. 0.05
   b. **5.1922**
   c. 6.2561
   d. 15.5291

2. Suppose the critical region for a certain test of the null hypothesis is of the form $F > 9.48773$ and the computed value of F from the data is 1.86. Then:
   a. H_0 should be rejected.
   b. The significance level is given by the area to the left of 9.48773 under the appropriate F distribution.
   c. **The significance level is given by the area to the right of 9.48773 under the appropriate *F* distribution.**
   d. None of these.

3. Assuming that the null hypothesis being tested by ANOVA is false, the probability of obtaining a F-ratio that exceeds the value reported in the F table as the 95th percentile is:
   a. **less than .05.**
   b. equal to .05.
   c. greater than .05.
   d. None of these

4. Assuming no bias, the total variation in a response variable is due to error (unexplained variation) plus differences due to treatments (known variation). If known variation is large compared to unexplained variation, which of the following conclusions is the best?
   a. There is no evidence for a difference in response due to treatments.
   b. **There is evidence for a difference in response due to treatments.**
   c. There is significant evidence for a difference in response due to treatments
   d. The treatments are not comparable.

5. What would happen if instead of using an ANOVA to compare 10 groups, you performed multiple *t*-tests?
   a. Nothing, there is no difference between using an ANOVA and using a *t*-test.
   b. Nothing serious, except that making multiple comparisons with a *t*-test requires more computation than doing a single ANOVA.
   c. Sir Ronald Fischer would be turning over in his grave; he put all that work into developing ANOVA, and you use multiple *t*-tests
   d. Making multiple comparisons with a *t*-test increases the probability of making a Type I error.

6. What is the function of a post-test in ANOVA?
   a. Determine if any statistically significant group differences have occurred.
   b. Describe those groups that have reliable differences between group means.
   c. Set the critical value for the *F* test (or chi-square).
   d. None of these

7. An investigator randomly assigns 30 college students into three equal size study groups (early-morning, afternoon, late-night) to determine if the period of the day at which people study has an effect on their retention. The students live in a controlled environment for one week, on the third day of the experimental treatment is administered (study of predetermined material). On the seventh day the investigator tests for retention. In computing his ANOVA table, he sees that his MS within groups is larger than his MS between groups. What does this result indicate?
   a. An error in the calculations was made.
   b. There was more than the expected amount of variability between groups.
   c. There was more variability between subjects within the same group than there was between groups.
   d. There should have been additional controls in the experiment.

8. In ANOVA with 4 groups and a total sample size of 44, the computed *F* statistic is 2.33 In this case, the *p*-value is:
   a. exactly 0.05
   b. less than 0.05
   c. greater than 0.05
   d. cannot tell - it depends on what the SSE is

9. Assume that there is no overlap between the box and whisker plots for three drug treatments where each drug was administered to 35 individuals. The box plots for these data:
   a. provide no evidence for, or against, the null hypothesis of ANOVA
   b. represent evidence for the null hypothesis of ANOVA
   c. represent evidence against the null hypothesis of ANOVA
   d. can be very misleading, you should not be looking at box plots in this setting

10. ANOVA was used to test the outcomes of three drug treatments. Each drug was given to 20 individuals. The MSE for this analysis was 16. What is the standard deviation for all 60 individuals sampled for this study?
   a. 6.928
   b. 48
   c. 16
   d. **4**