

- b. be rejected
- c. Not enough information is given to answer this question.
- d. None of these alternatives is correct.

Exhibit 9-5

A random sample of 100 people was taken. Eighty-five of the people in the sample favored Candidate A. We are interested in determining whether or not the proportion of the population in favor of Candidate A is significantly more than 80%.

- ___ 7. Refer to Exhibit 9-5. The test statistic is
 - a. 0.80
 - b. 0.05
 - c. 1.25
 - d. 2.00
- ___ 8. Refer to Exhibit 9-5. The p -value is
 - a. 0.2112
 - b. 0.05
 - c. 0.025
 - d. 0.1056
- ___ 9. Refer to Exhibit 9-5. At 95% confidence, it can be concluded that the proportion of the population in favor of candidate A
 - a. is significantly greater than 80%
 - b. is not significantly greater than 80%
 - c. is significantly greater than 85%
 - d. is not significantly greater than 85%

Exhibit 13-5

Part of an ANOVA table is shown below.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Treatment	180	3		
Error				
TOTAL	480	18		

- ___ 10. Refer to Exhibit 13-5. The mean square due to treatment (MSTR) is
 - a. 20
 - b. 60
 - c. 300
 - d. 15
- ___ 11. Refer to Exhibit 13-5. The mean square due to error (MSE) is
 - a. 60
 - b. 15
 - c. 300
 - d. 20
- ___ 12. Refer to Exhibit 13-5. The test statistic is
 - a. 2.25

- b. 6
- c. 2.67
- d. 3

- ___ 13. Refer to Exhibit 13-5. At 95% confidence, you
- a. think that there is a relationship between the race and the level of cholesterol
 - b. reject the null and find significant differences in the mean scores on the cholesterol test
 - c. do not reject the null and do not find any significant differences in the mean scores on the cholesterol test
 - d. None of the above
- ___ 14. A regression analysis between sales (Y in \$1000) and advertising (X in dollars) resulted in the following equation

$$\hat{Y} = 30,000 + 4 X$$

The above equation implies that an

- a. increase of \$4 in advertising is associated with an increase of \$4,000 in sales
 - b. increase of \$1 in advertising is associated with an increase of \$4 in sales
 - c. increase of \$1 in advertising is associated with an increase of \$34,000 in sales
 - d. increase of \$1 in advertising is associated with an increase of \$4,000 in sales
- ___ 15. In regression analysis, the variable that is being predicted is the
- a. dependent variable
 - b. independent variable
 - c. intervening variable
 - d. is usually x
- ___ 16. The equation that describes how the dependent variable (y) is related to the independent variable (x) is called
- a. the correlation model
 - b. the regression model
 - c. correlation analysis
 - d. None of these alternatives is correct.
- ___ 17. In regression analysis, the independent variable is
- a. used to predict other independent variables
 - b. used to predict the dependent variable
 - c. called the intervening variable
 - d. the variable that is being predicted

Exhibit 14-10

The following information regarding a dependent variable Y and an independent variable X is provided.

$$\sum X = 16 \quad \sum (X - \bar{X})(Y - \bar{Y}) = -8$$

$$\sum Y = 28 \quad \sum (X - \bar{X})^2 = 8$$

$$n = 4 \quad SST = 42$$

$$SSE = 34$$

- ___ 18. Refer to Exhibit 14-10. The slope of the regression function is
- a. -1
 - b. 1.0
 - c. 11

- d. 0.0
- ___ 19. Refer to Exhibit 14-10. The Y intercept is
- 1
 - 1.0
 - 11
 - 0.0
- ___ 20. Refer to Exhibit 14-10. The coefficient of determination is
- 0.1905
 - 0.1905
 - 0.4364
 - 0.4364
- ___ 21. Refer to Exhibit 14-10. The coefficient of correlation is
- 0.1905
 - 0.1905
 - 0.4364
 - 0.4364
- ___ 22. Refer to Exhibit 14-10. The MSE is
- 17
 - 8
 - 34
 - 42
- ___ 23. Refer to Exhibit 14-10. The point estimate of Y when $X = 3$ is
- 11
 - 14
 - 8
 - 0
- ___ 24. The ANOVA procedure is a statistical approach for determining whether or not
- the means of two samples are equal
 - the means of two or more samples are equal
 - the means of more than two samples are equal
 - the means of two or more populations are equal

Problem

25. A population of 1,000 students spends an average of \$10.50 a day on dinner. The standard deviation of the expenditure is \$3. A simple random sample of 64 students is taken.
- What are the expected value, standard deviation, and shape of the sampling distribution of the sample mean?
 - What is the probability that these 64 students will spend a combined total of more than \$715.21?
 - What is the probability that these 64 students will spend a combined total between \$703.59 and \$728.45?
26. It is crucial that the variance of a production process be less than or equal to 25. A sample of 22 is taken. The sample variance equaled 26.
- Construct a 90% confidence interval for the population variance.

- b. Construct a 90% confidence interval for the population standard deviation.
 - c. State the null and alternative hypotheses to be tested.
 - d. Compute the test statistic.
 - e. The null hypothesis is to be tested at the 10% level of significance. Using the critical value approach, state the decision rule for the test.
 - f. What do you conclude about the population variance?
27. Below you are given a partial computer output based on a sample of 25 observations relating the hourly wage (Y), number of years of schooling (X_1) and score on an aptitude test (X_2).

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Regression			35	
Error				
TOTAL	100			

	Coefficient	Standard Error
Constant	7.00	4.00
X_1	1.50	0.50
X_2	0.5	0.25

- a. Write down the estimated regression equation. Interpret the coefficients of the estimated equation.
- b. If Jenny has a bachelor's degree and scores 10 on the aptitude test, how much is her estimated hourly wage?
- c. At $\alpha = 0.05$, test to determine if the number of advertising spots is a significant variable.
- d. What is the coefficient of determination for this regression? Interpret it.
- e. At $\alpha = 0.05$, test for the significance of the regression.

Sample Final Exam Answer Section

MULTIPLE CHOICE

1. ANS: B
2. ANS: B
3. ANS: C
4. ANS: A
5. ANS: C
6. ANS: B
7. ANS: C
8. ANS: D
9. ANS: B
10. ANS: B
11. ANS: D
12. ANS: D
13. ANS: C
14. ANS: D
15. ANS: A
16. ANS: B
17. ANS: B
18. ANS: A
19. ANS: C
20. ANS: A
21. ANS: D
22. ANS: A
23. ANS: C
24. ANS: D

PROBLEM

25. ANS:
 - a. 10.5 0.363 normal
 - b. 0.0314
 - c. 0.0794
26. ANS:
 - a. 16.7123 to 47.1043
 - b. 4.0881 to 6.8633
 - c. $H_0: \sigma^2 \leq 25$
 $H_a: \sigma^2 > 25$
 - d. 21.84
 - e. Reject H_0 if chi-square > 29.6151
 - f. Do not reject H_0

27. ANS:

a. $\hat{y} = 7 + 1.5 * X_1 + 0.5 * X_2$

b_1 = The hourly wage will increase by 1.5 units for an additional year of education, keeping score on the aptitude test constant.

b_2 = The hourly wage will increase by 0.5 units for an additional point on the aptitude test, keeping education constant.

b_0 = The hourly wage is \$7 when both education and score on the aptitude test are zero.

b. $\hat{y} = 7 + 1.5 * 16 + 0.5 * 10 = \36

d. $t = 0.5/0.25 = 2 < \text{critical } t \text{ value} = 2.07$; do not reject H_0 ; score on the aptitude test is not significant.

f. $SSR/SST = 70/100 = 70\%$. 70% of the variation in hourly wage is explained by the education and the score on the aptitude test.

g. Reject the null because obtained F value of 25.67 > critical F value of 3.44.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Regression	70	2	35	25.67
Error	<u>30</u>	<u>22</u>	<u>1.37</u>	
TOTAL	100	24		