1. R. We have created a 95% confidence interval for mu with the result (10, 15). What decision will we make if we test H0: mu less or equal than 11 against H1: mu greater than 11 at = 0.05?

a. We cannot tell what our decision will be from the information given.
b. Reject H0 in favor of H1 at the 5% level.
c. Accept H0 in against H1.
d. Fail to reject H0 in favor of H1 at the 10% level.
e. Reject H0 in favor of H1 at the 10% level.

2. R. A major DVD rental chain is considering opening a new store in an area that currently does not have any such stores. The chain will open if there is evidence that more than 5,000 of the 20,000 households in the area are equipped with DVD players. It conducts a telephone poll of 300 randomly selected households in the area and finds that 96 have DVD players. The value of the test statistic in this problem is approximately equal to:

a. 2.80
b. -2.60
c. 1.94
d. 1.30
e. -2.80

3. R. A study is conducted to test whether there is a significant difference in the scores of male and female students for a STATS course. Following information is obtained: Male: sample size = 25, sample mean =72 and the population standard deviation = 9. Female: sample size 15, sample mean = 75 and the population standard deviation = 7. Based on this information, what is the absolute value of the test statistic?

a. 1.176
b. 1.472
c. 4.399
d. 2.1
e. 1.562

4. R. A study is conducted to test whether there is a significant difference in the scores of male and female students for a STAT course. Following information is obtained: Male: sample size = 25, sample mean =72 and the population standard deviation = 9. Female: sample size 15, sample mean = 75 and the population standard deviation = 7. Based on this information, what is the p-value for testing $H_0: \mu_M - \mu_F \geq 0$ against $H_0: \mu_M - \mu_F < 0$:

a. 0.119
b. 0.238
c. 0.0291
d. 0.0179
e. 0.0358

5. R. When the necessary conditions are met, a two-tail test is being conducted to test the difference between two population proportions. The two sample proportions are $\hat{p}_1$ = 0.20 and $\hat{p}_2$= 0.15, and the standard error of the sampling distribution of $\hat{p}_1 - \hat{p}_2$ is 0.025. The calculated value of the test statistic will be:

a. z = 2.0
b. t = 2.0
c. t = 1.2
d. z = 1.15
e. z = -1.15

6. The Owner of a local grocery shop has recently surveyed a sample of $n = 20$ customers of the shop. She would now like to determine whether or not the mean age of her customer is greater than 30. If so, she plans to alter the shop to appeal to an older customers. If not, no changes will be made. Suppose she found that the sample mean was 30.45 years and the sample standard deviation was 5 years. The p-value of the test is between what two values?

a. 0.250<p-value<0.400
b. 0.257<p-vaue<0.688
c. 0.600<p-value <0.750
d. 0.025<p-value<0.05
e. 0.950<p-value<0.975

7. The marketing manager for an automobile manufacturer is interested in determining the proportion of new compact-car owners who would have purchased a GPS navigation system if it had been available for an additional cost of $300. The manager believes from previous information that the proportion is greater than 0.50. Suppose that a survey of 100 new compact-car owners is selected and 56 indicate that they would have purchased the GPS navigation system. If you were to conduct a test to determine whether there is evidence that the proportion is above 0.5 at 0.03 level of significance. The test statistic and the critical value corresponding to this test are respectively given as

a. 1.2 and 1.88
b. 1.2 and 1.96
c. -1.2 and 1.88
d. -1.2 and 2.33
e. 1.0 and 1.88

8. It is claimed that a new diet will neither increase nor decrease a cattle's weight within a period of two weeks. The weights of 7 cattle that were administered this diet were recorded as shown below before and after a 2-week period. Assuming that the weights before and after the experiment are approximately normally distributed. Test the hypothesis that there no difference between these weights.

Cattle							
Weight Before(kg)	59.0	52.5	42.0	50.5	57.2	36.5	35
Weight After (kg)	53.0	49.0	38.0	43.5	50.0	31.0	26.0

The associated p-value for this test is?

a. p-value<0.001
b. p-value<0.0005
c. p-value<0.500
d. p-value<0.1
e. p-value<0.03

9. The use of preservatives by food processors has become a controversial issue. Suppose two preservatives are extensively tested and determined safe for use in meats. A processor wants to compare the preservatives for their effects on retarding spoilage. Suppose 10 cuts

of fresh meat are treated with preservative *I* and 12 are treated with preservative *II*, and the number of hours until spoilage begins is recorded for each of the 22 cuts of meat. The results are summarized below

$$\text{preservative } I\text{: G}\bar{X}_1 = 35, S_1 = 10$$

$$\text{preservative } II\text{: } \bar{X}_2 = 35, S_2 = 12$$

Suppose α=0.1, can we conclude that there is a difference in the variation based on the two preservatives and which of the following represents the results of the relevant hypothesis test?

a. The null hypothesis is not rejected
b. The null hypothesis is rejected
c. The alternative hypothesis is rejected
d. Both A and B are correct
e. Both B and C are correct

10. The director of transportation of a large company is interested in the usage of her van pool. She considers her routes to be divided into local and non-local. She is particularly interested in learning if there is a difference in the proportion of males and females who use the local routes. She takes a sample of a day's riders and finds the following:

	Male	Female	Total
Local	27	44	71
Non-Local	33	25	58
Total	60	69	129

She will use this information to perform a chi-square hypothesis test using a level of significance of 0.05. The value of the test statistic associated with the Chi-square test for difference in two proportions is?

a. 4.5680
b. 3.3986
c. 1.0985
d. 7.9534
e. 0.4567

11. When testing $H_0 : \pi_1 - \pi_2 \leq 0$ versus $H_1 : \pi_1 - \pi_2 > 0$, the observed value of the Z test statistic was found to be – 2.13. The *p*-value for this test is

a. 0.9834
b. 0.0166
c. 0.0332
d. 0.9668
e. 0.9750

12. A study was conducted to determine whether the use of seat belts in motor vehicles depends on the educational status of the parents. A sample of 792 children treated for injuries sustained from motor vehicle accidents was obtained, and each child was classified according to (1) parents' educational status (College Degree or Non-College Degree) and (2) seat belt usage (worn or not worn) during the accident. The number of children in each category is given in the table below.

	Non-College Degree	College Degree
Seat belts not worn	31	148
Seat belts worn	283	330

Which test would be used to properly analyze the data in this experiment?

a. χ^2 test for independence
b. χ^2 test for differences among more than two proportions
c. Wilcoxon rank sum test for independent populations
d. Kruskal-Wallis rank test
e. F test

13. R. A chi-squared test of a contingency table with 4 rows and 5 columns shows that the value of the test statistic is 22.18. The most accurate statement that can be made about the p-value for this test is that

a. the p-value is greater than 0.025 but smaller than 0.05

b. the p-value is greater than 0.05

c. the p-value is greater than 0.01 but smaller than 0.025

d. the p-value is greater than 0.10

e. the p-value is greater than 0.05 but smaller than 0.10

14. R. Conduct a test to determine whether the two classifications A and B are independent, using the data in the accompanying table and $\alpha = 0.01$

	B_1	B_2
A_1	42	28
A_2	23	57

Using the above information, the alternative hypothesis

a. The two variables are dependent.

b. The percentages of both A and B are equal.

c. The two variables are independent.

d. The mean of A equals the mean of B.

e. The mean of A is not equal to the mean of B.

15. R. Conduct a test to determine whether the two classifications A and B are independent, using the data in the accompanying table and $\alpha =$ 0.01

	B_1	B_2
A_1	42	28
A_2	23	57

Using the above information, If the test statistic is equal to 14.847 then your conclusion is

a. The two variables are dependent.

b. The two variables are independent.

c. The percentages of both A and B are equal.

d. The mean of A equals the mean of B.

e. The mean of A is not equal to the mean of B.

16. Recent studies have found that American children are more obese than in the past. The amount of time children spent watching television has received much of the blame. A survey of 100 ten-year-olds revealed the following with regards to weights and average number of hours a day spent

watching television. We are interested in testing whether the mean number of hours spent watching TV and weights are independent at 1% level of significance.

Weights	TV Hours			Total
	0-3	3-6	6+	
More than 10 lbs. overweight	1	9	20	30
Within 10 lbs. of normal weight	20	15	15	50
More than 10 lbs. underweight	10	5	5	20
Total	31	29	40	100

The critical value of this test will be

a. 13.277
b. 6.635
c. 14.860
d. 21.666
e. 15.456