

PRINTABLE VERSION

Quiz 13

You scored 100 out of 100

Question 1

Your answer is CORRECT.

It has been observed that some persons who suffer colitis, again suffer colitis within one year of the first episode. This is due, in part, to damage from the first episode. The performance of a new drug designed to prevent a second episode is to be tested for its effectiveness in preventing a second episode. In order to do this two groups of people suffering a first episode are selected. There are 55 people in the first group and this group will be administered the new drug. There are 45 people in the second group and this group will be administered a placebo. After one year, 11% of the first group has a second episode and 9% of the second group has a second episode. Conduct a hypothesis test to determine, at the significance level 0.01, whether there is reason to believe that the true percentage of those in the first group who suffer a second episode is different from the true percentage of those in the second group who suffer a second episode? Select the [Alternative Hypothesis, Value of the Test Statistic].

- a) ☐ $[p_1 < p_2, 0.3302]$
- b) ☐ $[p_1 = p_2, 0.3302]$
- c) ☐ $[p_1 > p_2, 0.3302]$
- d) ☒ $[p_1 \neq p_2, 0.3302]$
- e) ☐ $[p_1 \neq p_2, 0.4302]$
- f) ☐ None of the above

Question 2

Your answer is CORRECT.

A private and a public university are located in the same city. For the private university, 1046 alumni were surveyed and 643 said that they attended at least one class reunion. For

the public university, 804 out of 1315 sampled alumni claimed they have attended at least one class reunion. Is the difference in the sample proportions statistically significant? (Use $\alpha=0.05$)

- a) ☐ There is not enough information to make a conclusion.
- b) ☐ Reject the null hypothesis which states there is no difference in the proportion of alumni that attended at least one class reunion in favor of the alternate which states there is a difference in the proportions.
- c) ☒ Fail to reject the null hypothesis. There is not enough evidence to conclude that there is a difference in the proportions.

Question 3

Your answer is CORRECT.

State the type of hypothesis test to be used in the following situation:

The Blue Diamond Company advertises that their nut mix contains (by weight) 40% cashews, 15% Brazil nuts, 20% almonds and only 25% peanuts. The truth-in-advertising investigators took a random sample (of size 20 lbs) of the nut mix and found the distribution to be as follows: 6 lbs of Cashews, 3 lbs of Brazil nuts, 5 lbs of Almonds and 6 lbs of Peanuts. At the 0.01 level of significance, is the claim made by Blue Diamond true?

- a) ☐ Matched Pairs T Test
- b) ☐ One Sample Z Test for Means
- c) ☒ χ^2 Goodness of Fit Test
- d) ☐ One Sample Z Test for Proportions
- e) ☐ One Sample T Test for Means
- f) ☐ Two Sample Z Test for Proportions
- g) ☐ χ^2 Test for Independence

h) ☐ Two Sample T Test for Means

Question 4

Your answer is CORRECT.

State the type of hypothesis test to be used in the following situation:

Solid fats are more likely to raise blood cholesterol levels than liquid fats. Suppose a nutritionist analyzed the percentage of saturated fat for a sample of 6 brands of stick margarine (solid fat) and for a sample of 6 brands of liquid margarine and obtained the following results:

Stick	25.8	26.9	26.2	25.3	26.7	26.1
Liquid	16.9	17.4	16.8	16.2	17.3	16.8

Is there a significant difference in the average amount of saturated fat in solid and liquid fats? Assume the population is normally distributed.

- a)** ☒ Two Sample T Test for Means
- b)** ☐ Matched Pairs T Test
- c)** ☐ χ^2 Goodness of Fit Test
- d)** ☐ Two Sample Z Test for Proportions
- e)** ☐ One Sample Z Test for Proportions
- f)** ☐ One Sample Z Test for Means
- g)** ☐ χ^2 Test for Independence
- h)** ☐ One Sample T Test for Means

Question 5

Your answer is CORRECT.

State the type of hypothesis test to be used in the following situation:

Researchers hoped to determine whether time spent watching television is associated

with cardiovascular fitness. Subjects were asked how many hours per day they watch television and were classified as physically fit if they scored in the excellent or very good category on a step test. The data obtained is as follows:

	Physically Fit	Not Physically Fit
0 hours	35	147
1-2 hours	101	629
3-4 hours	28	222
5 or more hours	4	34

Determine if the association the researchers were interested in exists or not.

- a) ☒ χ^2 Test for Independence
- b) ☐ Two Sample Z Test for Proportions
- c) ☐ χ^2 Goodness of Fit Test
- d) ☐ One Sample T Test for Means
- e) ☐ One Sample Z Test for Means
- f) ☐ Two Sample T Test for Means
- g) ☐ One Sample Z Test for Proportions
- h) ☐ Matched Pairs T Test

Question 6

Your answer is CORRECT.

In a certain city, there are about one million eligible voters. A simple random sample of size 10,000 was chosen to study the relationship between gender and participation in the last election. The results were:

	Men	Women
Voted	2499	3611
Didn't Vote	1677	2213

If we are testing for a relationship between gender and participation in the last election,

what is the test statistic?

- a) ☐ $\chi^2 = 7.162$
- b) ☐ $\chi^2 = 9.387$
- c) ☒ $\chi^2 = 4.775$
- d) ☐ $z = -9.597$
- e) ☐ $z = -17.196$

Question 7

Your answer is CORRECT.

In a certain city, there are about one million eligible voters. A simple random sample of size 10,000 was chosen to study the relationship between gender and participation in the last election. The results were:

	Men	Women
Voted	2699	3455
Didn't Vote	1788	2058

If we are testing for a relationship between gender and participation in the last election, what is the p-value and decision at the 5% significance level? Select the [p-value, Decision to Reject (RH_0) or Failure to Reject (FRH_0)]

- a) ☐ [p-value = 0.085, RH_0]
- b) ☐ [p-value = 0.010, FRH_0]
- c) ☒ [p-value = 0.010, RH_0]
- d) ☐ [p-value = 0.085, FRH_0]
- e) ☐ [p-value = 0.005, RH_0]

Question 8

Your answer is CORRECT.

The Blue Diamond Company advertises that their nut mix contains (by weight) 40% cashews, 15% Brazil nuts, 20% almonds and only 25% peanuts. The truth-in-advertising investigators took a random sample (of size 20 lbs) of the nut mix and found the distribution to be as follows: 5 lbs of Cashews, 6 lbs of Brazil nuts, 6 lbs of Almonds and 3 lbs of Peanuts. At the 0.05 level of significance, is the claim made by Blue Diamond true?

Select the [p-value, Decision to Reject (RH_0) or Failure to Reject (FRH_0)].

- a) ☐ [p-value = 0.015, RH_0]
- b) ☐ [p-value = 0.115, RH_0]
- c) ☒ [p-value = 0.115, FRH_0]
- d) ☐ [p-value = 0.015, FRH_0]
- e) ☐ [p-value = 0.058, RH_0]

Question 9

Your answer is CORRECT.

Quart cartons of milk should contain at least 32 ounces. A sample of 20 cartons contained the following amounts in ounces. Does sufficient evidence exist to conclude the mean amount of milk in cartons is less than 32 ounces at the 5% significance level?

The data is: (27.8, 28.5, 31.6, 27.6, 32.7, 28.8, 32.4, 32.4, 31.6, 28.5, 28.6, 28.5, 31.3, 28.7, 32.1, 31.6, 32.7, 27.9, 32.3, 31.7)

Select the [p-value, Decision to Reject (RH_0) or Failure to Reject (FRH_0)].

- a) ☐ [p-value = 0.001, FRH_0]
- b) ☐ [p-value = 0.999, RH_0]
- c) ☒ [p-value = 0.001, RH_0]
- d) ☐ [p-value = 0.000, RH_0]

e) ☐ [p-value = 0.999, FRH_0]

Question 10

Your answer is CORRECT.

Hippocrates magazine states that 32 percent of all Americans take multiple vitamins regularly. Suppose a researcher surveyed 750 people to test this claim and found that 263 did regularly take a multiple vitamin. Is this sufficient evidence to conclude that the actual percentage is different from 32% at the 5% significance level?

Select the [p-value, Decision to Reject (RH_0) or Failure to Reject (FRH_0)].

a) ☒ [p-value = 0.072, FRH_0]

b) ☐ [p-value = 0.036, RH_0]

c) ☐ [p-value = 0.122, FRH_0]

d) ☐ [p-value = 0.036, FRH_0]

e) ☐ [p-value = 0.072, RH_0]

Question 11

Your answer is CORRECT.

A national computer retailer believes that the average sales are greater for salespersons with a college degree. A random sample of 31 salespersons with a degree had an average weekly sale of \$3666 last year, while 33 salespersons without a college degree averaged \$3177 in weekly sales. The standard deviations were \$468 and \$642 respectively. Is there evidence at the 5% level to support the retailer's belief?

Select the [p-value, Decision to Reject (RH_0) or Failure to Reject (FRH_0)].

a) ☐ [p-value = 0.015, RH_0]

b) ☐ [p-value = 0.015, FRH_0]

c) ☒ [p-value = 0.001, RH_0]

- d) ☐ [p-value = 0.000, RH_0]
- e) ☐ [p-value = 0.001, FRH_0]

Question 12

Your answer is **CORRECT**.

The community hospital is studying its distribution of patients. A random sample of 318 patients presently in the hospital gave the following information:

Type of Patient	Old Rate of Occurrences	Present Number of Occurrences
Maternity Ward	20%	77
Cardiac Ward	32%	86
Burn Ward	10%	29
Children's Ward	15%	50
All Other Wards	23%	76

Test the claim at the 5% significance level that the distribution of patients in these wards has not changed.

Select the [p-value, Decision to Reject (RH_0) or Failure to Reject (FRH_0)].

- a) ☐ [p-value = 0.220, RH_0]
- b) ☐ [p-value = 0.110, RH_0]
- c) ☐ [p-value = 0.017, FRH_0]
- d) ☒ [p-value = 0.220, FRH_0]
- e) ☐ [p-value = 0.017, RH_0]

Question 13

Your answer is **CORRECT**.

In a experiment on relaxation techniques, subject's brain signals were measured before and after the relaxation exercises with the following results:

Person	1	2	3	4	5
Before	41.2	42.3	42.6	41.6	38.2

After	42.2	43.3	36.2	37.3	34.4
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Is there sufficient evidence to suggest that the relaxation exercise slowed the brain waves? Assume the population is normally distributed.

Select the [p-value, Decision to Reject (RH_0) or Failure to Reject (FRH_0)].

- a) ☐ [p-value = 0.085, RH_0]
- b) ☐ [p-value = 0.170, FRH_0]
- c) ☒ [p-value = 0.085, FRH_0]
- d) ☐ [p-value = 0.042, RH_0]
- e) ☐ [p-value = 0.170, RH_0]