This Test has 213 attempts. For information on editing questions, click **More Help** below.
This Test has at least one attempt in progress. Deleting questions has been disabled. The attempts currently in progress are by: CCDS TAN MIN, CCDS ZHENG NAN, CCDS ARUNKUMAR S/O DHANASEKARAN, CCDS GOH ZHUAN BOON (WU ZHUANWEN), CCDS TAN JUN JIE TERENCE, CCDS SPENCER NG WEN XUAN and 1 more.

Test Canvas: Mock Quiz 4 (**Webcam**) - Requires Respondus LockDown Browser

The Test Canvas lets you add, edit, and reorder questions, as well as review a test. More Help

Question Settings

You can edit, delete, or change the point values of test questions on this page. If necessary, test attempts will be regraded after you submit your changes.

Description	
Instructions	Answer all questions. It is a closed-book quiz. You are only allowed to use calculator and the normal distribution table provided in NTU Learn. Select the most suitable answers. Some questions may have **multiple answers.** **You are not allowed taking photos of any questions in this mock quiz. If you do so, your final marks may be reduced**. This quiz has 14 questions.
Total Questions	14
Total Points	14
Number of Attempts	213

Select: All None | Select by Type: - Question Type -

Points [ ] Update and Regrade | Hide Question Details

1. Multiple Choice: Q1: Let X and Y denote the tarsus lengths...

Points: 1

Question

Let *X* and *Y* denote the tarsus lengths of male and female grackles, respectively. Assume that X is $N(\mu_X, \sigma_X^2)$ and *Y* is $N(\mu_Y, \sigma_Y^2)$. Given that n_X=25, $\overline{X} = 33.80$, $s_X^2 = 4.88$, n_Y=29, $\overline{Y} = 31.66$ and $s_Y^2 = 5.81$, test. (Assume that the sample sizes are large enough for CLT.)

$H_O : \mu_X = \mu_Y$ against $H_A : \mu_X > \mu_Y$ with α=0.01.

Answer

1. Reject H_O becasue $Z > Z_\alpha$, where Z=3.403 and Z_α=2.326.
2. Reject H_O becasue $Z > Z_\alpha$, where Z=4.581 and Z_α=2.326.
3. Do not reject H_O becasue $Z < Z_\alpha$, where Z=1.567 and Z_α=2.326.
4. Do not reject H_O becasue $Z < Z_\alpha$, where Z=2.056 and Z_α=2.326.
5. Reject H_O becasue $Z > Z_\alpha$, where Z=3.959 and Z_α=2.326.

2. Multiple Choice: Q2: Let Y be a binomial distribution b(10...

Points: 1

Question

Let Y be a binomial distribution b(100, p). To test H_0=0.08 against H_1: p< 0.08, we reject H_0 and accept H_1 if and only Y≤6. Use normal approximation to determine the significance level α of the test.

Answer

- ✓ α=0.2902
- α=0.0511
- α=0.1113
- α=0.1611
- α=0.9114

3. **Multiple Choice: Q3: If a newborn baby has a birth weight ...** Points: 1

Question

If a newborn baby has a birth weight that is less than 2500 grams (5.5 pounds), we say that the baby has a low birth weight. The proportion of babies with a low birth weight is an indicator of nutrition (or lack of nutrition) for the mothers. For the United States, approximately 7% of babies have a low birth weight. Let p equal the proportion of babies born in the Sudan who weight less than 2500 grams. We should test the null hypothesis H_0 : p=0.07 against the alternative hypothesis H_1 : p>0.07. If y=23 babies out of a random sample of n=209 babies weighted less than 2500 grams, what is your conclusion at a significance level of α=0.05 and α=0.01?

Answer

- a. For α=0.05, do not reject H_0 and for α=0.01, do not reject H_0.
- b. For α=0.05, reject H_0 and for α=0.01, reject H_0.
- c. For α=0.05, do not reject H_0 and for α=0.01, reject H_0.
- ✓ d. For α=0.05, reject H_0 and for α=0.01, do not reject H_0.

4. **Multiple Choice: Q4: It was claimed that the proportion of...** Points: 1

Question

It was claimed that the proportion of Americans who select jogging as one of their recreational activities is p=0.25. A shoe manufacturer thought that p was larger than 0.25. They decided to test the null hypothesis H_0: p=0.25 against the alternative hypothesis H_A: p>0.25. If 1497 out of a random sample of n=5757 selected jogging, what is your conclusion at a significance level of α=0.05 and α=0.025?

Answer

- a. For α=0.05, do not reject H_0 and for α=0.025, do not reject H_0.
- b. For α=0.05, do not reject H_0 and for α=0.025, reject H_0.
- c. For α=0.05, reject H_0 and for α=0.025, reject H_0.
- ✓ d. For α=0.05, reject H_0 and for α=0.025, do not reject H_0.

5. **Multiple Choice: Q5: Ground beef is packaged in small tray...** Points: 1

Question

Ground beef is packaged in small trays, intended to hold 1 pound of meat. A random sample of 35 packages in the small tray produced weight measurement with an average of 1.01 pounds and a standard deviation of 0.18 pounds. If you were the quality control manager and wanted to make sure that the average amount of ground beef was indeed 1 pound, what hypotheses would you test and what is the corresponding p-value?

Answer

- ✓ a. H_0: μ=1 and H_A: μ≠1 and p-value=0.7414
- b. H_0: μ=1 and H_A: μ≠1 and p-value=0.7794
- c. H_0: μ=1 and H_A: μ≠1 and p-value=0.5331

d. H_0: μ=1 and H_A: μ>1 and p-value=0.8508

e. H_0: μ=1 and H_A: μ>1 and p-value=0.6591

f. H_0: μ=1 and H_A: μ<1 and p-value=0.1025

6. **Multiple Choice: Q6: If 49 measurements of the specific gr...** Points: 1

Question	If 49 measurements of the specific gravity of aluminum had a mean of 2.705 and a standard deviation of 0.028, find the point estimate for the actual specific gravity of aluminum and calculate the standard error.
Answer	✓ a. Point estimate for the actual specific gravity of aluminum=2.705 standard error=0.004
	b. Point estimate for the actual specific gravity of aluminum=2.705 standard error=0.000571
	c. Point estimate for the actual specific gravity of aluminum=0.3864 standard error=0.004
	d. Point estimate for the actual specific gravity of aluminum=2.705 standard error=0.000571
	e. Point estimate for the actual specific gravity of aluminum=2.705 standard error=0.01568

7. **Multiple Choice: Q7: Among the data collected for the Worl...** Points: 1

Question	Among the data collected for the World Health Organization air quality monitoring project is a measure of suspended particles in $\mu g/m^3$. Let X and Y equal the concentration of suspended particles in $\mu g/m^3$ in the city center (commercial district), for Melbourne and Houston, respectively. If $\overline{X} = 72.9$ and $S_X = 25.6$ are calculated from n_X=35 observations of *X* and $\overline{Y} = 81.7$ and $S_Y = 28.3$ are calculated n_Y=40 observations of Y. Test: H_O : $\mu_X=\mu_Y$ *against* H_A: $\mu_X<\mu_Y$ *using* $\alpha=0.05$.
Answer	✓ a. Do not reject H_O becasue p-value=0.0787>α
	b. Do not reject H_O becasue p-value=0.1087>α
	c. Reject H_O becasue p-value=0.0175<α
	d. Reject H_O becasue p-value=0.0417<α
	e. Reject H_O becasue p-value=0.0317<α

8. **Multiple Choice: Q8: A manager evaluates effectiveness of ...** Points: 1

Question	A manager evaluates effectiveness of a major hardware upgrade by running a certain process 50 times before the upgrade and 50 times after it. Based on these data, the average running time is 8.5 minutes before the upgrade, 7.2 minutes after it. Historically, the standard deviation has been 1.8 minutes, and presumably it has not changed. Construct a 90% confidence interval showing how much the mean running time reduced due to the hardware upgrade. Let μ_x and μ_y be respectively the means before and after upgrade.
Answer	✓ a. A 90% confidence interval for the difference of means ($\mu_x - \mu_y$) is [0.7 1.9].

b. A 90% confidence interval for the difference of means $(\mu_x - \mu_y)$ is [0.6 1.5].

c. A 90% confidence interval for the difference of means $(\mu_x - \mu_y)$ is [0.8 1.8].

d. A 90% confidence interval for the difference of means $(\mu_x - \mu_y)$ is [0.85 1.85].

e. A 90% confidence interval for the difference of means $(\mu_x - \mu_y)$ is [7.2 8.5].

9. **Multiple Choice: Q9: Internet connections are often slowed...** Points: 1

Question	Internet connections are often slowed by delays at nodes. Let us determine if the delay time increases during heavy-volume times. Five hundred packets are sent through the same network between 5 pm and 6 pm (sample X), and three hundred packets are sent between 10 pm and 11 pm (sample Y). The early sample has a mean delay time of 0.8 sec with a standard deviation of 0.1 sec whereas the second sample has a mean delay time of 0.5 sec with a standard deviation of 0.08 sec. Construct a 99.5% confidence interval for the difference between the mean delay times.
Answer	✓ A 99.5% confidence interval for the difference of mean execution times $(\mu_x - \mu_y)$ is [0.282 0.318].
	A 99.5% confidence interval for the difference of mean execution times $(\mu_x - \mu_y)$ is [0.225 0.302].
	A 99.5% confidence interval for the difference of mean execution times $(\mu_x - \mu_y)$ is [0.121 0.153].
	A 99.5% confidence interval for the difference of mean execution times $(\mu_x - \mu_y)$ is [0.125 0.450].
	A 99.5% confidence interval for the difference of mean execution times $(\mu_x - \mu_y)$ is [0.421 0.670].

10. **Multiple Choice: Q10: The number of concurrent users for so...** Points: 1

Question	The number of concurrent users for some internet service provider has always averaged 5000 with a standard deviation of 800. After an equipment upgrade, the average number of users at 100 randomly selected moments of time is 5200. Does it indicate, at a 5% level of significance, that the mean number of concurrent users has increased? Assume that the standard deviation of the number of concurrent users has not changed.
Answer	✓ Our test statistic Z = 2.5 belongs to the rejection region; therefore, we reject the null hypothesis. The data (5200 users, on the average, at 100 times) provided sufficient evidence in favor of the alternative hypothesis that the mean number of users has increased.
	Our test statistic Z = 2.5 does not belong to the rejection region; therefore, we do not reject the null hypothesis. The data (5200 users, on the average, at 100 times) did not provide sufficient evidence to support that the mean number of users has increased.
	Our test statistic Z = 1.96 does not belong to the rejection region; therefore, we do not reject the null hypothesis. The data (5200 users, on the average, at 100 times) did not provide sufficient evidence to support that the mean number of users has increased.
	Our test statistic Z = 1.96 belongs to the rejection region; therefore, we reject the null hypothesis. The data (5200 users, on the average, at 100 times) provided sufficient evidence in favor of the alternative hypothesis that the mean number of users has increased.
	Our test statistic Z >4.5 belongs to the rejection region; therefore, we reject the null hypothesis. The data (5200 users, on the average, at 100 times) provided sufficient evidence in favor of the alternative hypothesis that the mean number of users has increased.

11. **Multiple Choice: Q11: According to the Federal Poverty Meas...** Points: 1

Question	According to the Federal Poverty Measure 12% of the U.S. population lives in poverty. The governor of a certain state believes that the proportion there is lower. In a sample of size 1,550, 163 were impoverished according to the federal measure. Test whether the true proportion of the state's population that is impoverished is less than 12%, at the 5% level of significance.
Answer	✓ a. $Z=-1.798, -Z_{0.05}=-1.645$, reject H_0;

b. $Z=-1.798, -Z_{0.025}=-1.96$, do not reject H_0;

c. $Z=-1.798, Z_{0.025}=1.96$, do not reject H_0;

d. None of the others

12. **Multiple Answer: Q12: A special interest group asserts that...** Points: 1

Question	A special interest group asserts that 90% of all smokers began smoking before age 18. In a sample of 850 smokers, 687 began smoking before age 18. Test whether the true proportion of all smokers who began smoking before age 18 is less than 90%, at the 1% level of significance.
Answer	a. $Z=-8.92, -Z_{0.005}=-2.58$, reject H_0;
	✓ b. $Z=-8.92, -Z_{0.01}=-2.33$. reject H_0;
	c. $Z=8.92, Z_{0.01}=2.33$. reject H_0;
	d. Cannot apply CLT because the sample size is not enough.

13. **Multiple Answer: Q13: Five years ago 3.9% of children in a ...** Points: 1

Question	Five years ago 3.9% of children in a certain region lived with someone other than a parent. A sociologist wishes to test whether the current proportion is different. Perform the relevant test at the 5% level of significance using the following data: in a random sample of 2,759 children, 119 lived with someone other than a parent.
Answer	✓ a. A two-tailed test, $Z=1.11$, $Z_{0.025}=1.96$, do not reject H_0.
	b. An one-tailed test, $Z=1.11$, $Z_{0.05}=1.645$, do not reject H_0.
	c. An one-tailed test, $Z=2.11$, $Z_{0.05}=1.645$, reject H_0.
	d. None of the others

14. **Multiple Choice: Q14: Two years ago 72% of household in a c...** Points: 1

Question	Two years ago 72% of household in a certain county regularly participated in recycling household waste. The county government wishes to investigate whether that proportion has increased after an intensive campaign promoting recycling. In a survey of 900 households, 674 regularly participate in recycling. Perform the relevant test at the 10% level of significance.
Answer	✓ a. Conclusion: the proportion has increased.
	b. Conclusion: Not enough evidence that the proportion has increased.
	c. Conclusion: The proportion has changed.
	d. Conclusion: the proportion has changed.
	e. None of the others

Select: All None Select by Type: - Question Type -

Points Update and Regrade Hide Question Details

← OK