FINAL REVIEW

NOTE: A review to help you study for the final. These questions are only intended to provide the scope and familiarity and is not in any way similar with the actual test questions.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Provide an appropriate response.

1) Calculate the correlation coefficient, r, for the data below. 1) _____

x	4	6	13	10	8	7	9	11	12	5
y	−16	−14	3	−5	−8	−12	−7	−3	0	−14

A) 0.819 B) 0.990 C) 0.792 D) 0.881

2) Determine whether the normal sampling distribution can be used. The claim is $p > 0.25$ and the sample size is $n = 18$. 2) _____

A) Use the normal distribution. B) Do not use the normal distribution.

3) Find the value of E, the margin of error, for $c = 0.90$, $n = 10$ and $s = 3.2$. 3) _____

A) 0.59 B) 1.83 C) 1.85 D) 1.40

4) Classify the two given samples as independent or dependent. 4) _____

Sample 1: Pre−training weights of 19 people
Sample 2: Post−training weights of 19 people

A) independent B) dependent

5) Construct a 95% confidence interval for the population mean, μ. Assume the population has a normal distribution. A sample of 25 randomly selected students has a mean test score of 81.5 with a standard deviation of 10.2. 5) _____

A) (87.12, 98.32) B) (56.12, 78.34) C) (66.35, 69.89) D) (77.29, 85.71)

6) The distribution of room and board expenses per year at a four−year college is normally distributed with a mean of $5850 and standard deviation of $1125. Random samples of size 20 are drawn from this population and the mean of each sample is determined. Which of the following mean expenses would be considered unusual? 6) _____

A) $5180 B) $6350 C) $6180 D) none of these

7) Assume that the salaries of elementary school teachers in the United States are normally distributed with a mean of $39,000 and a standard deviation of $3000. What is the cutoff salary for teachers in the bottom 10%? 7) _____

A) $43,935 B) $35,160 C) $34,065 D) $42,840

8) Find the area of the indicated region under the standard normal curve. 8) _____

A) 0.1504 B) 0.0212 C) 0.1292 D) 0.8489

9) Find the P–value for the hypothesis test with the standardized test statistic z. Decide whether to reject H_0 for the level of significance α. 9) _____

Left–tailed test
$z = -1.83$
$\alpha = 0.05$

A) 0.0336; reject H_0 B) 0.0672; fail to reject H_0
C) 0.9664; fail to reject H_0 D) 0.0672; reject H_0

10) The P–value for a hypothesis test is P = 0.007. Do you reject or fail to reject H_0 when the level of significance is $\alpha = 0.01$? 10) _____

A) reject H_0
B) fail to reject H_0
C) not sufficient information to decide

11) A pollster wishes to estimate the proportion of United States voters who favor capital punishment. How large a sample is needed in order to be 99% confident that the sample proportion will not differ from the true proportion by more than 4%? 11) _____

A) 849 B) 1037 C) 2073 D) 17

12) Ten pairs of points yielded a correlation coefficient r of 0.790. If $\alpha = 0.05$, which of the following statements is correct if H_0: $\rho = 0$? (Do not calculate a t-value.) 12) _____

A) Because 0.790 is greater than 0.632, the null hypothesis is not rejected.
B) Because 0.790 is greater than 0.632, the null hypothesis is rejected.
C) There is no correlation between the variables.
D) Because 0.790 is greater than 0.602, the null hypothesis is not rejected.

Provide an appropriate response. Use the Standard Normal Table to find the probability.

13) IQ test scores are normally distributed with a mean of 105 and a standard deviation of 13. An individual's IQ score is found to be 126. Find the z–score corresponding to this value. 13) _____

A) –0.62 B) 0.62 C) 1.62 D) –1.62

14) Assume that the salaries of elementary school teachers in the United States are normally distributed with a mean of $32,000 and a standard deviation of $3000. If a teacher is selected at random, find the probability that he or she makes more than $36,000. 14) _____

A) 0.4040 B) 0.1056 C) 0.0918 D) 0.9082

From a random sample of workers at a large corporation you find that 58% of 200 went on a vacation last year away from home for at least a week.

15) An approximate 95% confidence interval is (0.50, 0.66). Which of the following statements is a correct interpretation? 15) _____

A) We are 95% confident that between 50% and 66% of the samples will have a proportion near 58%.

B) We are 95% confident that the proportion of coworkers who went on a vacation last year away from home for at least a week is between 50% and 66%.

C) There is a 95% chance that a random selected coworker has gone on a vacation last year away from home for at least a week.

D) 95% of the coworkers fall in the interval (0.50, 0.66).

Solve the problem.

16) A researcher wants to know whether athletic men are more flexible than non–athletic men. For this experiment, a man who exercised vigorously at least four times per week was considered "athletic." Flexibility is measured in inches on a sit & reach box. Test the researcher's claim using the following summary statistics: 16) _____

Athletic men	Non-athletic men
$n = 50$	$n = 40$
$\overline{x} = 4.3$ inches	$\overline{x} = 3.2$
$s = 2.1$ inches	$s = 1.0$ inches

Assume that all conditions for testing have been met. Report the test statistic and p–value. At the 5% significance level, state your decision regarding the null hypothesis and your conclusion about the original claim. Round all values to the nearest thousandth.

A) t = –3.270; p = 0.002; Reject the null hypothesis; there is not strong evidence to suggest that athletic men are more flexible than non–athletic men.

B) t = –3.270; p = 0.002; Reject the null hypothesis; there is strong evidence to suggest that athletic men are more flexible than non–athletic men.

C) t = 3.270; p = 0.001; Fail to reject the null hypothesis; there is not strong evidence to suggest that athletic men are more flexible than non–athletic men.

D) t = 3.270; p = 0.001; Reject the null hypothesis; there is strong evidence to suggest that athletic men are more flexible than non–athletic men.

17) The data in the table represent the amount of pressure (psi) exerted by a stamping machine (x), and the amount of scrap brass shavings (in pounds) that are collected from the machine each hour (y). Also shown below are the outputs from two different statistical technologies (TI–83/84/94 Calculator and Excel). A scatterplot of the data confirms that there is a linear association. Report the equation for predicting scrap brass shavings using words such as scrap, not x and y. State the slope and intercept of the prediction equation. Round all calculations to the nearest thousandth. 17) _____

x	y
2.00	2.30
7.80	15.14
14.51	28.65
2.80	4.15
4.01	6.35
6.21	10.52
11.84	24.05
5.11	8.75
11.67	22.22
8.70	17.02

LinReg

$y = ax + b$

$a = 2.134464237$

$b = -2.018775528$

$r^2 = 0.996074796$

$r = 0.998035467$

	Coefficients
Intercept	-2.018775528
X Variable 1	2.134464237

A) scrap = 2.134 – 2.019(pressure); slope = –2.019 and the intercept is 2.134.
B) scrap = –2.019 + 2.134(pressure); slope = 2.134 and the intercept is –2.019.
C) scrap = –2.019 + 2.134(pressure); slope = –2.019 and the intercept is 2.134.
D) scrap = 2.134 – 2.019(pressure); slope = 2.134 and the intercept is –2.019.

18) Assume that a hypothesis test of the given claim will be conducted. Identify the type I or type II error for the test. A consumer advocacy group claims that the mean mileage for the Carter Motor Company's new sedan is less than 32 miles per gallon. Identify the type I error for the test. 18) _____

A) Reject the claim that the mean is equal to 32 miles per gallon when it is actually 32 miles per gallon.
B) Reject the claim that the mean is equal to 32 miles per gallon when it is actually less than 32 miles per gallon.
C) Fail to reject the claim that the mean is equal to 32 miles per gallon when it is actually greater than 32 miles per gallon.
D) Fail to reject the claim that the mean is equal to 32 miles per gallon when it is actually less than 32 miles per gallon.

19) If the correlation coefficient is 0.790, what is the explained variation? 19) _____

A) 21% B) 79% C) 62.4% D) 37.6%

Answer Key
Testname: NOVA ONLINE FINAL REVIEW FOR STUDENTS

1) B
2) B
3) C
4) B
5) D
6) A
7) B
8) A
9) A
10) A
11) B
12) B
13) C
14) C
15) B
16) D
17) B
18) A
19) C