Name_____

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

Is the observed sample proportion unusual?

1) A candy company claims that its jelly bean mix contains 15% blue jelly beans. Suppose that the candies are packaged at random in small bags containing about 200 jelly beans. If you receive a bag with 40 blue jelly beans, would you be doubtful of the company's claim? Answer by calculating the appropriate z–score.   1) _____
   A) Yes, z = 9.9
   B) No, z = 1.98
   C) Yes, z = 1.98
   D) No, z = 1.77
   E) Yes, z = 1.77

Find the mean/standard error of the sampling distribution of the proportion.

2) Based on past experience, a bank believes that 8% of the people who receive loans will not make payments on time. The bank has recently approved 600 loans. Describe the sampling distribution model of the proportion of clients in this group who may not make timely payments.   2) _____
   A) There is not enough information to describe the distribution.
   B) mean = 92%; standard error = 1.1%
   C) mean = 8%; standard error = 0.3%
   D) mean = 92%; standard error = 0.3%
   E) mean = 8%; standard error = 1.1%

Provide an appropriate response.

3) Which of the following sampling distributions of $\bar{x}$ has the least amount of variability?   3) _____
   I) $\mu = 50$, $\sigma = 10$, n = 100
   II) $\mu = 50$, $\sigma = 5$, n = 30
   III) $\mu = 50$, $\sigma = 10$, n = 30
   A) III
   B) I
   C) II
   D) not enough information because the variability depends upon the shape of the sampling distribution
   E) not enough information because the variability depends upon the shape of the population distribution

4) Assume that the heights of adult Caucasian women have a mean of 63.6 inches and a standard deviation of 2.5 inches. If 100 women are randomly selected, find the probability that they have a mean height greater than 63.0 inches.   4) _____
   A) not enough information to determine
   B) 0.9918
   C) 0.8989
   D) 0.0082
   E) 0.2881

5) According to a Harris poll conducted in October, 2007, 71% of 1052 American adults believe that   5) _____
   increased carbon dioxide and other gases released into the atmosphere will, if unchecked, lead to
   global warming and an increase in average temperatures. Assuming the population proportion is
   .75, how many standard deviations above or below the mean does the Harris poll sample fall?
      A) 2.86 above
      B) 2.86 below
      C) 3 above
      D) 3 below
      E) 0.003 below

6) In a Quinnipiac University Poll of registered voters nationwide taken in June of 2007, the responses   6) _____
   to the question "Who do you blame the most for the recent increase in gasoline prices: oil producing
   countries, oil companies, President Bush, Americans who drive vehicles that use a lot of gasoline,
   or normal supply and demand pressures?" are given in the table that follows. Based on these
   responses, find a point estimate for the population proportion who would answer "President
   Bush."

Oil Companies	736
President Bush	342
Supply & Demand	222
Oil Producing Countries	188
American Drivers	68
Total	1556

   (http://www.pollingreport.com/energy.htm)

      A) 0.47
      B) 311
      C) none of these
      D) 0.34
      E) 0.22

7) In 2006, the General Social Survey asked 917 respondents "how much do you favor or oppose   7) _____
   requiring car makers to make cars and trucks that use less gasoline?" Their responses are given in
   the table below. Based on these responses, find a point estimate for the population proportion who
   either strongly favor or favor requiring car makers to make cars and trucks that use less gasoline.

Strongly Favor	645
Favor	197
Neither Favor nor Oppose	52
Oppose	14
Strongly Oppose	9

      A) 0.92
      B) 0.84
      C) 0.21
      D) none of these
      E) 0.70

8) In 2006, the General Social Survey asked respondents how many hours they spent per week on the internet. The sample mean was 5.74 and the standard error of this estimate is 0.20. What is the margin of error for a 95% confidence interval for the population mean number of hours spent weekly on the internet?

    A) 0.39   B) 0.52   C) 1.96   D) 0.40   E) 0.20

8) _____

9) In 2006, the General Social Survey asked respondents how many hours they spent per week on the internet. The sample mean was 5.74 and the standard error of this estimate is 0.20. Construct a 95% confidence interval for the population mean number of hours spent per week on the internet.

    A) (3.78, 7.7)   B) (5.35, 6.13)   C) (5.22, 6.26)   D) (5.34, 6.14)   E) (5.54, 5.94)

9) _____

10) In a survey of 1,000 television viewers, 40% said they watch network news programs. For a 99% confidence level, the margin of error for this estimate is 3.99%. If we only want to be 90% confident, how will the margin of error change?

    A) Since less confidence allows a wider interval, the margin of error will be larger.
    B) Since less confidence allows a wider interval, the margin of error will be smaller.
    C) the margin of error will remain the same.
    D) Since less confidence allows a narrower interval, the margin of error will be smaller.
    E) Since less confidence allows a narrower interval, the margin of error will be larger.

10) _____

Construct the requested confidence interval from the supplied information.

11) A savings and loan association needs information concerning the checking account balances of its local customers. A random sample of 14 accounts was checked and yielded a mean balance of $664.14 and a standard deviation of $297.29. Find a 98% confidence interval for the true mean checking account balance for local customers.

    A) ($492.52, $835.76)
    B) ($455.65, $835.76)
    C) ($455.65, $872.63)
    D) ($453.56, $874.72)
    E) ($493.71, $834.57)

11) _____

Examine the given statement, then identify whether the statement is a null hypothesis, an alternative hypothesis or neither.

12) The mean income of workers who have majored in history is less than $25,000.

    A) Null hypothesis   B) Alternative hypothesis   C) Neither

12) _____

Assume that a simple random sample has been selected from a normally distributed population. Find the test statistic t

13) Test the claim that for the population of female college students, the mean weight is given by $\mu = 132$ lb. Sample data are summarized as $n = 20$, $\overline{x} = 137$ lb, and $s = 14.2$ lb. Use a significance level of $\alpha = 0.1$.

Find the test statistic t.

    A) 7.04   B) 14.2   C) 1.729   D) 1.57   E) –1.57

13) _____

For the given significance test, explain the meaning of a Type I error, a Type II error, or a correct decision as specified.

14) At one school, the average amount of time tenth–graders spend watching television each week is 21.6 hours. The principal introduces a campaign to encourage the students to watch less television. One year later, the principal performs a significance test using $\alpha = 0.05$ to determine whether the average amount of time spent watching television per week has decreased. The hypotheses are:

$H_0: \mu = 21.6$ hours

$H_a: \mu < 21.6$ hours

If the P–value = 0.04 and a decision error is made, what type of error is it? Explain.

A) Type II error. We conclude that the average amount of time spent watching television each week is 21.6 hours when it is in fact less.

B) Type I error. We conclude that the average amount of time spent watching television each week is less than 21.6 hours when it in fact is not.

C) Type I error. We conclude that the average amount of time spent watching television each week is 21.6 hours when it is in fact less.

D) Type II error. We conclude that the average amount of time spent watching television each week is less than 21.6 hours when it in fact is not.

14) _____

Determine the null and alternative hypotheses.

15) In 1990, the average duration of long–distance telephone calls originating in one town was 7.2 minutes. A long–distance telephone company wants to perform a hypothesis test to determine whether the average duration of long–distance phone calls has changed from the 1990 mean of 7.2 minutes.

A) $H_0: \mu \neq 7.2$ minutes

$H_a: \mu = 7.2$ minutes

B) $H_0: \mu = 7.2$ minutes

$H_a: \mu \leq 7.2$ minutes

C) $H_0: \mu = 7.2$ minutes

$H_a: \mu \neq 7.2$ minutes

D) $H_0: \mu < 7.2$ minutes

$H_a: \mu > 7.2$ minutes

E) $H_0: \mu = 7.2$ minutes

$H_a: \mu > 7.2$ minutes

15) _____

Classify the conclusion of the significance test as a Type I error, a Type II error, or No error.

16) At one school, the average amount of time that tenth–graders spend watching television each week is 21 hours. The principal introduces a campaign to encourage the students to watch less television. One year later, the principal wants to perform a significance test to determine whether the average amount of time spent watching television per week has decreased. The hypotheses are:

$H_0: \mu = 21$ hours

$H_a: \mu < 21$ hours

Suppose that the results of the sample lead to nonrejection of the null hypothesis. Classify that conclusion as a Type I error, a Type II error, or a correct decision, if in fact the mean amount of time, μ, spent watching television has not decreased.

A) Type II error   B) Type I error   C) No error

16) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question

Perform a significance test for a population proportion using the critical value approach.

17) A supplier of 3.5" disks claims that no more than 1% of the disks are defective. In a random sample of 600 disks, it is found that 3% are defective, but the supplier claims that this is only a sample fluctuation. At the 0.01 level of significance, do the data provide sufficient evidence that the percentage of defects exceeds 1%?

17) _____