### \_\_\_\_\_ Date: \_\_\_\_

# AP Stats MOCK Chapter 8 Test MC

Multiple Choice - 13 questions - Identify the choice that best completes the statement or answers the question.

- 1. A level *C* confidence interval is
  - A. any interval with margin of error  $\pm C$ .
  - B. an interval computed from sample data by a method that has probability C of producing an interval containing the true value of the parameter of interest.
  - C. an interval with margin of error  $\pm C$  that is also correct C% of the time.
  - D. an interval computed from sample data by a method that guarantees that the probability the interval computed contains the parameter of interest is C.
  - E. an interval computed from sample data that has probability (1 C) of **not** containing the parameter of interest.
- 2. A 95% confidence interval for the mean  $\mu$  of a population is computed from a random sample and found to be 9 ± 3. We may conclude that
  - A. there is a 95% probability that  $\mu$  is between 6 and 12.
  - B. 95% of values sampled are between 6 and 12.
  - C. if we took many, many additional random samples and from each computed a 95% confidence interval for  $\mu$ , approximately 95% of these intervals would contain  $\mu$ .
  - D. there is a 95% probability that the true mean is 9 and a 95% chance that the true margin of error is 3.
  - E. all of the above are true.
  - 3. The critical value used to construct a confidence interval for a proportion depends upon
    - A. The confidence level being used and the size of the sample.
    - B. The size of the sample and the sample proportion.
    - C. The confidence level, the size of the sample, and the standard deviation of the population.
    - D. Only on the sample size.
    - E. Only on the confidence level.
  - 4. A researcher studying reaction time of drivers states that, "A 95% confidence interval for the mean time it takes for a driver to apply the brakes after seeing the brake lights on a vehicle in front of him is 1.2 to 1.8 seconds. What are the point estimate and margin of error for this interval?
    - A. Point estimate = 1.2 seconds; margin of error = 0.6 seconds.
    - B. Point estimate = 1.2 seconds; margin of error = 0.3 seconds.
    - C. Point estimate = 1.5 seconds; margin of error 95%.
    - D. Point estimate = 1.5 seconds; margin of error = 0.6 seconds.
    - E. Point estimate = 1.5 seconds; margin of error = 0.3 seconds.
    - 5. An agricultural researcher plants 25 plots with a new variety of corn. A 90% confidence interval for the average yield for these plots is found to be  $162.72 \pm 4.47$  bushels per acre. Which of the following would produce a confidence interval with a smaller margin of error than this one?
      - A. Using a 95% confidence level.
      - B. Reducing bias in the study design.
      - C. Planting 100 plots, rather than 25.
      - D. Using 25 control plots with an old variety of corn.
      - E. None of the above.

- 6. Other things being equal, the margin of error of a confidence interval increases as
  - A. the sample size increases.
  - B. the sample mean increases.
  - C. the population standard deviation increases.
  - D. the confidence level decreases.
  - E. none of the above.

#### Scenario 8-4

A sociologist is studying the effect of having children within the first two years of marriage on the divorce rate. Using hospital birth records, she selects a random sample of 200 couples that had a child within the first two years of marriage. Following up on these couples, she finds that 80 couples are divorced within five years.

- 7. Use Scenario 8-4. A 90% confidence interval for the proportion p of all couples that had a child within the first two years of marriage and are divorced within five years is
  - A.  $0.40 \pm 0.004$ .
  - B.  $0.40 \pm 0.035$ .
  - C.  $0.40 \pm 0.044$ .
  - D.  $0.40 \pm 0.057$ .
  - E.  $0.40 \pm 0.068$ .
- 8. What is the critical value  $t^*$  for a 90% confidence interval when n = 15?
  - A. 1.645
  - B. 1.753
  - C. 1.761
  - D. 1.960
  - E. 2.145

9. What proportion of scores in a *t*-distribution with 6 degrees of freedom are above t = 2.447?

- A. 0.90
- B. 0.10
- C. 0.05
- D. 0.025
- E. 0.01
- 10. An SRS of 100 postal employees found that the average time these employees had worked for the postal service was J = 7 years with standard deviation s = 2 years. Assume the distribution of the time the population of employees have worked for the postal service is approximately Normal. A 95% confidence interval for the mean time  $\mu$  the population of postal service employees have spent with the postal service is
  - A.  $7 \pm 2$ .
  - B.  $7 \pm 1.984$ .
  - C.  $7 \pm 0.525$ .
  - D.  $7 \pm 0.4$ .
  - E.  $7 \pm 0.2$ .

- 11. The heights of young American women, in inches, are approximately Normally distributed with mean  $\mu$  and standard deviation  $\sigma = 2.4$ . If I want to construct a 99% confidence interval with a margin of error of no more than  $\pm 1$  inch, the smallest sample I can take is closest to
  - A. 2.
  - B. 7.
  - C. 16.
  - D. 38.
  - E. 39.
- 12. In checking conditions for constructing confidence intervals for a population mean, it's important to plot the distribution of sample data. Below are dot plots describing samples from three different populations. For which of the three samples would it be safe to construct a *t*-interval?



- A. Sample X only
- B. Sample Y only
- C. Sample Z only
- D. Samples Y and Z
- E. None of the samples

#### Name: \_

13. In preparation for constructing confidence interval for a population mean, it's important to plot the distribution of sample data. Below are stem plots describing samples from three different populations. For which of the three samples would it be safe to construct a *t*-interval?

	Sample X n = 20		Sample Y n =19	:	Sample Z n =11
0	2	0	2	3	2
1		1	5	4	1
2		2	1	5	356
3		3		6	012
4	1	4	1	7	12
5	356779	5	688	8	5
6	01235568	6	15567		•
7	123	7	0255788		
8	5				

A. Sample X only

B. Sample Y only

C. Sample Z only

 $D. \quad Sample \ X \ and \ Z$ 

E. None of the plots.

## AP Stats MOCK Chapter 8 Test MC Answer Section

#### **MULTIPLE CHOICE**

1.	ANS: E	B PTS:	1	TOP:	Interpret confidence level
2.	ANS: C	C PTS:	1	TOP:	Interpret confidence level
3.	ANS: E	E PTS:	1	TOP:	Critical value
4.	ANS: E	E PTS:	1	TOP:	Margin of error and point estimate
5.	ANS: C	C PTS:	1	TOP:	Factors influencing width of confidence interval
6.	ANS: C	PTS:	1	TOP:	Factors influencing width of confidence interval
7.	ANS: D	D PTS:	1	TOP:	Calculate confidence interval for p
8.	ANS: C	C PTS:	1	TOP:	Using t-table to find critical t* values
9.	ANS: D	D PTS:	1	TOP:	Using t-table to find critical t* values
10.	ANS: D	D PTS:	1	TOP:	Calculate confidence interval for mu
11.	ANS: E	E PTS:	1	TOP:	Choosing sample size (means)

12. ANS: B

/B/Correct! Plot Y is a large enough sample (n= 41) so that the central limit theorem compensates for the moderate skew. Plot X is strongly skewed and the sample size is too small; Plot Z has outliers.

PTS: 1 REF: Test 8A

13. ANS: C

/C/Correct! Plot Z is a small sample, but the distribution of sample data is symmetric and has no outliers. It should be safe to use the t-procedure in this case. Plot X has an outlier, and the sample size in Plot Y is too small to compensate for the strong skew in the data.

PTS: 1 REF: Test 8B