1. Given a normal distribution with $\mu = 50$ and $\sigma = 4$. Between what two X values (symmetrically distributed around the mean) are 60% of the values?

   (a) 46.64 and 53.36 _____ (correct)

   (b) – 46.64 and – 53.36

   (c) – 0.84 and 0.84

   (d) – 46.64 and 53.36

   (e) 46.00 and 54.00

2. A set of final examination grades in an introductory statistics course is normally distributed, with a mean of 73 and a standard deviation of 8. What is the probability that a student scored between 65 and 89?

   (a) 0.8186 _____ (correct)

   (b) 0.1815

   (c) 0.9772

   (d) 0.1587

   (e) 0.5

3. Given an exponential distribution (of arrival time) with $\lambda = 5$, what is the probability that the arrival time is less than 0.3 or greater than 0.5?

   (a) 0.8590 _____ (correct)

   (b) 0.1410

   (c) 0.2231

   (d) 0.7769

   (e) 0.2000

4. Golfers arrive at the starter's booth of a public golf course at a rate of 8 per hour during the Monday-to-Friday midweek period. If a golfer has just arrived, what is the probability that the next golfer will arrive within 3 minutes (0.05 hour)?

   (a) 0.3297 _____ (correct)

   (b) 0.6703

   (c) 0.5276

   (d) 0.9765

   (e) 0.1500

5. A probability density function given by

$$f(x) = \begin{cases} \frac{3}{8}x^2, & 0 \le x \le 2, \\ 0, & \text{otherwise.} \end{cases}$$

Find $P(1 < X < 3)$.

(a) $\frac{7}{8}$ (correct)

(b) $\frac{1}{8}$

(c) 1

(d) $\frac{3}{8}$

(e) $\frac{1}{2}$

6. The amount of time a bank teller spends with each customer has a population mean $\mu = 3.10$ minutes and a standard deviation $\sigma = 0.40$ minute. If you select a random sample of 16 customers, there is an 85% chance that the sample mean is less than how many minutes?

(a) 3.204 (correct)

(b) 3.152

(c) 1.04

(d) 0.8413

(e) 2.978

7. According to Gallup's poll on consumer behavior, 36% of Americans say they will consider only cars manufactured by an American company when purchasing a new car. If you select a random sample of 200 Americans, what is the probability that the sample will have between 30% and 40% who say they will consider only cars manufactured by an American company when purchasing a new car?

   (a) 0.8426 (correct)

   (b) 0.1578

   (c) 0.36

   (d) 0.1

   (e) 0.7

8. A market researcher selects a simple random sample of $n = 100$ customers from a population of 2 million customers. After analyzing the sample, she states that she has 95% confidence that the mean annual income of the 2 million customers is between \$70,000 and \$85,000. Which option correctly describes the meaning of this statement?

   (a) If all possible samples of the same size $n = 100$ are taken, 95% of them will include the true population mean annual income within the interval developed. (correct)

   (b) If all possible samples of the same size $n = 100$ are taken, 5% of them will include the true population mean annual income within the interval developed.

   (c) If all possible samples of the same size $n = 100$ are taken, 100% of them will include the true population mean annual income within the interval developed.

   (d) There are 95% chances that the true population mean annual income will lie within the interval 70, 000 and 85, 000.

   (e) 95% of the 2 million customers have annual incomes between \$70,000 and \$85,000.

9. Assuming that the population is normally distributed, construct a 95% confidence interval for the population mean, based on the following sample of size $n = 7$:

   $X \rightarrow \quad 1,\ 2,\ 3,\ 4,\ 5,\ 6,\ 20$

   (a) (– 0.1232 , 11.8374) _____(correct)
   (b) (1.0690 , 10.6453)
   (c) (0.0773 , 11.6370)
   (d) (0.3205 , 11.3938)
   (e) (– 9.9652 , 21.6795)

10. In a survey of 2,395 adults, 1,916 reported that e-mails are easy to misinterpret, but only 1,269 reported that telephone conversations are easy to misinterpret. Construct a 95% confidence interval estimate for the population proportion of adults who report that telephone conversations are easy to misinterpret.

    (a) $0.5099 \leq \pi \leq 0.5498$ _____(correct)
    (b) $0.7840 \leq \pi \leq 0.8160$
    (c) $0.3456 \leq \pi \leq 0.7150$
    (d) $0.3740 \leq \pi \leq 0.8990$
    (e) $0.08040 \leq \pi \leq 0.9860$

11. If you want to be 95% confident of estimating the population proportion to within a sampling error of ± 0.04, what sample size is needed?

(a) 601 (correct)
(b) 600
(c) 600.25
(d) 422
(e) 423

12. If a quality control manager wants to estimate, with 95% confidence, the mean life of light bulbs to within ±20 hours and also assumes that the population standard deviation is 100 hours, how many light bulbs need to be selected?

(a) 97 (correct)
(b) 96
(c) 96.04
(d) 99
(e) 100

13. The telephone company wants to investigate the desirability of beginning a marketing campaign that would offer customers the right to purchase an additional telephone line at a substantially reduced installation cost. The campaign will be initiated if there is evidence that more than 20% of the customers would consider purchasing an additional telephone line if it were made available at a substantially reduced installation cost. A random sample of 500 households is selected. The results indicate that 135 of the households would purchase the additional telephone line at a reduced installation cost. At the 0.05 level of significance, we want to test "*is there evidence that more than 20% of the customers would purchase the additional telephone line?*". What is the value of the test and the critical value of the test?

(a) Test value: 3.9131 and critical value: 1.645 _____(correct)

(b) Test value: 3.9131 and critical value: – 1.645

(c) Test value: 3.9131 and critical value: 1.96

(d) Test value: 3.9131 and critical value: – 1.96

(e) Test value: – 3.9131 and critical value: 1.645

14. In a one-tail hypothesis test where you reject H_0 only in the lower tail, what is the critical value of the t_{STAT} test statistic with 20 degrees of freedom at the 0.01 level of significance?

(a) – 2.528 _____(correct)

(b) 2.528

(c) 2.539

(d) – 2.539

(e) – 2.33