1. The National Center for Health Statistics reported that of every 883 deaths in recent years, 24 resulted from an automobile accident, 182 from cancer, and 333 from heart disease. What is the probability that a particular death is due to an automobile accident?

A. 24/883 or 0.027
B. 539/883 or 0.610
C. 24/333 or 0.072
D. 182/883 or 0.206

2. If two events A and B are mutually exclusive, what does the special rule of addition state?

A. \( P(A \text{ or } B) = P(A) + P(B) \)
B. \( P(A \text{ and } B) = P(A) + P(B) \)
C. \( P(A \text{ and/or } B) = P(A) + P(B) \)
D. \( P(A \text{ or } B) = P(A) - P(B) \)

3. Which approach to probability is exemplified by the following formula?

\[
\text{Probability of an Event} = \frac{\text{Number of times event occurred in the past}}{\text{Total number of observations}}
\]

A. The classical approach
B. The empirical approach
C. The subjective approach
D. None of these.
4. A survey of top executives revealed that 35% of them regularly read Time magazine, 20% read Newsweek, and 40% read U.S. News & World Report. A total of 10% read both Time and U.S. News & World Report. What is the probability that a particular top executive reads either Time or U.S. News & World Report regularly?

A. 0.85  
B. 0.06  
C. 1.00  
D. 0.65

5. A tire manufacturer advertises, "the median life of our new all-season radial tire is 50,000 miles. An immediate adjustment will be made on any tire that does not last 50,000 miles." You purchased four of these tires. What is the probability that all four tires will wear out before traveling 50,000 miles?

A. 1/10 or 0.10  
B. ¼ or 0.25  
C. 1/64 or 0.0156  
D. 1/16 or 0.0625

6. There are 10 AAA batteries in a box and 3 are defective. Two batteries are selected without replacement. What is the probability of selecting a defective battery followed by another defective battery?

A. ½ or 0.50  
B. ¼ or 0.25  
C. 1/120 or about 0.0083  
D. 1/15 or about 0.07
7. Giorgio offers the person who purchases an 8-ounce bottle of Allure two free gifts, chosen from the following: an umbrella, a 1-ounce bottle of Midnight, a feminine shaving kit, a raincoat, or a pair of rain boots. If you purchased Allure, what is the probability you randomly selected an umbrella and a shaving kit in that order?

A. 0.00  
B. 1.00  
C. 0.05  
D. 0.20

8. A gumball machine has just been filled with 50 black, 150 white, 100 red, and 100 yellow gumballs that have been thoroughly mixed. Sue and Jim each purchase one gumball. What is the likelihood that both Sue and Jim will get red gumballs?

A. 0.50  
B. 0.062  
C. 0.33  
D. 0.75

9. How many permutations of the three letters C, D, and E are possible?

A. 3  
B. 0  
C. 6  
D. 8
10. The ABCD football association is considering a Super Ten Football Conference. The top 10 football teams in the country, based on past records, would be members of the Super Ten Conference. Each team would play every other team in the conference during the season and the team winning the most games would be declared the national champion. How many games would the conference commissioner have to schedule each year? (Remember, Oklahoma versus Michigan is the same as Michigan versus Oklahoma.)
   A. 45
   B. 50
   C. 125
   D. 14

11. If the variance is 3.6 grams, what is the standard deviation?
   A. 0.600
   B. 1.897
   C. 6.000
   D. 12.96

12. The probability distribution for the number of automobiles lined up at a Lakeside Olds dealer at opening time (7:30 a.m.) for service is:

<table>
<thead>
<tr>
<th>Number</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.05</td>
</tr>
<tr>
<td>2</td>
<td>0.30</td>
</tr>
<tr>
<td>3</td>
<td>0.40</td>
</tr>
<tr>
<td>4</td>
<td>0.25</td>
</tr>
</tbody>
</table>

   On a typical day, how many automobiles should Lakeside Olds expect to be lined up at opening time?
   A. 10.00
   B. 1.00
   C. 2.85
   D. 1.96
13. On a very hot summer day, 5% of the production employees at Midland States Steel are absent from work. The production employees are randomly selected for a special in-depth study on absenteeism. What is the probability of randomly selecting 10 production employees on a hot summer day and finding that none of them are absent?

A. 0.002  
B. 0.344  
C. 0.599  
D. 0.100

14. Sweetwater & Associates write weekend trip insurance at a very nominal charge. Records show that the probability that a motorist will have an accident during the weekend and file a claim is 0.0005. Suppose they wrote 400 policies for the coming weekend, what is the probability that exactly two claims will be filed?

A. 0.8187  
B. 0.2500  
C. 0.0164  
D. 0.0001

15. Which is true for a binomial distribution?

A. There are ten or more possible outcomes.  
B. The probability of success remains the same from trial to trial.  
C. The value of π is equal to 1.50.  
D. It approximates the Poisson distribution.
16. Which shape describes a Poisson distribution?
   
   A. Positively skewed
   
   B. Negatively skewed
   
   C. Symmetrical
   
   D. All apply

17. Data show that the weight of an offensive linesman may be any weight between 200 and 350 pounds. The distribution of weight is based on a ______________.

   A. continuous random variable
   
   B. discrete random variable
   
   C. qualitative variable
   
   D. All apply.

18. A company is studying the number of monthly absences among its 125 employees. The following probability distribution shows the likelihood that people were absent 0, 1, 2, 3, 4, or 5 days last month.

<table>
<thead>
<tr>
<th>Number of Days Absent</th>
<th>Probability</th>
</tr>
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<tr>
<td>0</td>
<td>0.60</td>
</tr>
<tr>
<td>1</td>
<td>0.20</td>
</tr>
<tr>
<td>2</td>
<td>0.12</td>
</tr>
<tr>
<td>3</td>
<td>0.04</td>
</tr>
<tr>
<td>4</td>
<td>0.04</td>
</tr>
<tr>
<td>5</td>
<td>0.00</td>
</tr>
</tbody>
</table>

   What is the variance of the number of days absent?

   A. 1.1616
   
   B. 1.41
   
   C. 5.00
   
   D. 55.52
19. A company is studying the number of monthly absences among its 125 employees. The following probability distribution shows the likelihood that people were absent 0, 1, 2, 3, 4, or 5 days last month.

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</tr>
<tr>
<td>5</td>
<td>0.00</td>
</tr>
</tbody>
</table>

What is the standard deviation of the number of days absent?

A. 1.1616  
B. 0  
C. 1.6595  
D. 1.0778

20. For a binomial distribution, the mean is 4.0 and \( n = 8 \). What is \( \pi \) for this distribution?

A. 0.5  
B. 1.00  
C. 4.0  
D. 0.1

21. The mean of any uniform probability distribution is _________.

A. \( \frac{b - a}{2} \)  
B. \( \frac{a + b}{2} \)  
C. \( \frac{\sum x_i}{n} \)  
D. \( n\pi \)
22. The standard deviation of any uniform probability distribution is ____________.
   A. \((b - a)/2\)
   B. \(n(1 - \pi)\)
   C. \(\sqrt{\frac{(b - a)^2}{12}}\)
   D. \(\sum P(x)(x - \bar{x})^2\)

23. Which of the following is true regarding the normal distribution?
   A. The mean, median, and mode are all equal.
   B. It has two modes.
   C. It is asymmetrical.
   D. The points of the curve meet the x-axis at \(z = -3\) and \(z = 3\).

24. For the normal distribution, the mean plus and minus two standard deviations will include about what percent of the observations?
   A. 50%
   B. 99.7%
   C. 95%
   D. 68%
25. For a standard normal distribution, what is the probability that \( z \) is greater than 1.75?

A. 0.0401  
B. 0.0459  
C. 0.4599  
D. 0.9599

26. What is the probability that \( z \) is between 0.0 and 2.0?

A. 1.0000  
B. 0.7408  
C. 0.1359  
D. 0.4772

27. The mean amount spent by a family of four on food is $500 per month with a standard deviation of $75. Assuming that the food costs are normally distributed, what is the probability that a family spends less than $410 per month?

A. 0.2158  
B. 0.8750  
C. 0.0362  
D. 0.1151
28. A binomial distribution has 50 trials (n = 50) with a probability of success of 0.50 (π = 0.50). To use the normal distribution to approximate the binomial, what are the mean and standard deviation?
   
   A. μ = 25 and σ = 3.5355
   B. μ = 25 and σ = 12.5
   C. μ = 25 and σ = 4.33
   D. μ = 50 and σ = 100

29. A binomial distribution has 100 trials (n = 100) with a probability of success of 0.25 (π = 0.25). We would like to find the probability of 34 or more successes using the normal distribution to approximate the binomial. Applying the continuity correction factor, what z-score should be used?
   
   A. 2.079
   B. 2.194
   C. 1.963
   D. 0.25

30. If an average of 12 customers are served per hour, then one customer arrives every ________.
   
   A. 12 minutes
   B. 60 minutes
   C. 5 minutes
   D. 10 minutes
31. When testing the safety of cars using crash tests, a sample of one or two cars is used because ____________.

A. sampling is more accurate
B. cars are destroyed
C. it is quicker
D. the population is very large

32. When all the items in a population have an equal chance of being selected for a sample, the process is called _________________.

A. simple random sampling
B. $z$-score
C. sampling error
D. nonprobability sampling

33. What is the difference between a sample mean and the population mean called?

A. Standard error of the mean
B. Sampling error
C. Interval estimate
D. Point estimate

34. All possible samples of size $n$ are selected from a population and the mean of each sample is determined. What is the mean of the sample means?

A. The population mean.
B. It is larger than the population mean.
C. It is smaller than the population mean.
D. It cannot be estimated in advance.
35. The true sampling error is usually not known because ________.
   A. μ is unknown
   B. μ is a random variable
   C. σ² is unknown
   D. the sample mean cannot be computed

36. For a given population, the mean of all the sample means \( \overline{X} \) of sample size \( n \), and the mean of all \( (N) \) population observations \( X \) are ________.
   A. Equal to \( \overline{X} \)
   B. Not equal
   C. Equal to \( \overline{x} - \mu \)
   D. Equal to the population mean \( \mu \)

37. As the size of the sample increases, what happens to the shape of the distribution of sample means?
   A. It cannot be predicted in advance.
   B. It approaches a normal distribution.
   C. It is positively skewed.
   D. It is negatively skewed.
38. The wildlife department has been feeding a special food to rainbow trout fingerlings in a pond. Based on a large number of observations, the distribution of trout weights is normally distributed with a mean of 402.7 grams and a standard deviation of 8.8 grams. What is the probability that the mean weight for a sample of 40 trout exceeds 405.5 grams?

A. 0.3782
B. 0.0222
C. 1.0
D. 0.5

39. Suppose a research firm conducted a survey to determine the mean amount steady smokers spend on cigarettes during a week. A sample of 100 steady smokers revealed that the sample mean is $20 and the sample standard deviation is $5. What is the probability that a sample of 100 steady smokers spend between $19 and $21?

A. 0.4772
B. 0.0228
C. 0.9544
D. 1.0000

40. Bones Brothers & Associates prepare individual tax returns. Over prior years, Bones Brothers has maintained careful records regarding the time to prepare a return. The mean time to prepare a return is 90 minutes and the standard deviation of this distribution is 14 minutes. Suppose 100 returns from this year are selected and analyzed regarding the preparation time. What assumptions do you need to make about the shape of the population distribution of all possible tax preparation times to make inferences about the mean time to complete a tax form?

A. The population distribution is skewed to the right.
B. The population distribution is skewed to the left.
C. The population distribution is normal.
D. The shape of the population distribution does not matter.
QMB 2100 Basic Business Statistics – Practice Test #2 - ANSWER KEY

1. A
2. A
3. B
4. D
5. D
6. D
7. C
8. B
9. C
10. A
11. B
12. C
13. C
14. C
15. B
16. A
17. A
18. A
19. D
20. A
21. B
22. C
23. A
24. C
25. A
26. D
27. D
28. A
29. C
30. C
31. B
32. A
33. B
34. A
35. A
36. D
37. B
38. B
39. C
40. D