1) In a binomial distribution the result counts the number of ways the ________ variable \( x \) could occur.
   A continuous
   B random
   C bisected
   D bimodal

2) In a binomial distribution with an \( n \) of 15 and a probability of success of 20 percent, what is the mean?
   A 1.0
   B 2.0
   C 3.0
   D 4.0

3) In a binomial distribution where there are 5 trials and the probability of success is 0.40, what is the probability of 1 or more? (Hint: use the Binomial Distribution table)
   A 0.0778
   B 0.9222
   C 0.2592
   D 0.3456

4) In a binomial distribution with an \( n \) of 15 and a probability of success of 20 percent, what is the probability of 2 or less? (Hint: use the Binomial Distribution table)
   A 0.398
   B 0.602
   C 0.231
   D 0.000
5) In a binomial distribution with an \( n \) of 15 and a probability of success of 20 percent, what is the probability of 0? (Hint: use the Binomial Distribution table)

A 0.3520  
B 0.0352  
C 0.1319  
D 0.2309

6) In a binomial distribution the random variable is based upon an experiment that has _________ possible outcomes.

A numerous  
B infinity  
C two  
D one

7) In a binomial distribution where there are 5 trials and the probability of success is 0.40, what is the standard deviation?

A 0.72  
B 1.2  
C 1.095  
D 1.047

8) The normal distribution is _________ skewed.

A negatively  
B positively  
C both negatively and positive skewed  
D not

9) A coffee vending machine is programmed to pour 8 ounces of coffee into a cup. According to the manufacturer's specifications the population standard deviation of each pour is 0.3 ounces, and the distribution is normal. What is the probability of randomly getting a cup of coffee and finding it contains more than 9.0 ounces?

A 0.4996  
B 0.9996  
C 0.0004
D 0.9992

10) All normal distribution are symmetrical, bell-shaped, and continuous and theoretically go to ______ in both directions (asymptotic).
A zero
B one
C ± three
D infinity

11) In a uniform probability distribution with a low point of 6 and a high point of 12, what would the standard deviation be?
A 9
B 3
C 18
D 1.73

12) If the mean of a normal distribution is 50 and the standard deviation is 5, what is the probability of between 34 and 42?
A 0.9445
B 0.0007
C 0.0541
D 0.4493

13) The binomial distribution can be approximated with the normal distribution if the distribution is in fact a binomial, and if np and nq are greater than or equal to:
A two.
B three.
C four.
D five.
14) In a population the mean is 100 and the variance is 250. The standard deviation of the sampling distribution of the sample mean is about what, when the sample size is 100?

A 15.8
B 1.58
C 158
D 1580

15) According to the Central Limit Theorem if all samples of an adequate size are taken from the population to create a sampling distribution of the sample mean, the standard deviation of the sampling distribution is equal to:

A the population variance divided by the sample size.
B the population variance divided by the square root of the sample size.
C the population standard deviation divided by the sample size.
D the population standard deviation divided by the square root of the sample size.

16) Sampling error is an estimate or approximation since the _______ values are often unknown.

A sample
B population
C critical
D significance

17) A sampling technique that is often utilized when the data to be extracted is classified by demographic categories, is called:

A simple random sampling.
B systematic sampling.
C stratified sampling.
D cluster sampling.

18) In a population the mean is 100 and the variance is 250. What is the variance of the sampling distribution of the sample mean if the sample size is 100?

A 100
B 250
C 25
19) According to the Central Limit Theorem if all samples of an adequate size are taken from the population to create a sampling distribution of the sample mean, the variance of the sampling distribution is equal to:
A the population mean.
B the population variance.
C the population variance divided by the sample size.
D the population variance divided by the square root of the sample size.

20) The difference between a sample statistic and the corresponding population parameter is called the:
A cluster sample.
B sampling distribution.
C sampling error.
D sampling margin.

21) If the sampling error is 2.6 and the population mean is 114, what is the sample mean?
A 111.4
B 116.6
C 2.6/114
D None of the above

22) A sampling technique that involves multiple stages is a:
A simple random sample.
B systematic sample.
C stratified sample.
D cluster sample.

23) The level of ________ is a percentage that indicates how sure we are that we have captured the population parameter within or estimate.
A Estimation
B error margin
24) A firm can only afford to take a sample survey of 256 people due to budget constraints. If they use the 90% confidence level and the population standard deviation is 120, what is the maximum allowed error?
A 0.92
B 10.00
C 11.07
D 12.34

25) In a particular study the $N = 10000$ $n = 250$ the sample mean is 275 and the population standard deviation is 25. Using the 95% confidence level what is the confidence interval within which the population mean would fall?
A 272.268 to 277.732
B 271.901 to 278.099
C 270.921 to 279.079
D 270.972 to 279.028

26) In a population the standard deviation is 10 and the maximum allowable error is 2. If we use the 90% confidence level what is the minimum acceptable sample size for a full research study?
A 16
B 27
C 41
D 68

27) In a particular study the $N = 10000$ $n = 250$ the sample mean is 275 and the population standard deviation is 25. Using the 92% confidence level what is the confidence interval within which the population mean would fall?
A 272.233 to 277.767
B 272.268 to 277.732
C 270.921 to 279.079
D 270.972 to 279.028
28) In a particular study the $N = 10000$ $n = 250$ the sample mean is 275 and the population standard deviation is 25. Using the 99% confidence level what is the confidence interval within which the population mean would fall?

A 271.901 to 278.099  
B 271.94 to 278.06  
C 270.929 to 279.071  
D 270.972 to 279.028

29) The E used in the calculation of minimum sample size, represents:

A the value as being an estimate.  
B the expected value.  
C the interval estimate.  
D The maximum margin of error.

(30) In a particular study the $N = 10000$ $n = 500$ the sample mean is 275 and the population standard deviation is 25. Using the 85% confidence level what is the confidence interval within which the population mean would fall?

A 273.207 to 276.793  
B 273.161 to 275.839  
C 273.431 to 276.569  
D 273.390 to 276.610
Useful formulas

<table>
<thead>
<tr>
<th>Concept</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binomial Distribution</td>
<td>$p(x) = \frac{n!}{x!(n-x)!} p^x (1-p)^{n-x}$</td>
</tr>
<tr>
<td>Mean of the Binomial Distribution</td>
<td>$\mu = np$</td>
</tr>
<tr>
<td>Variance of the Binomial Distribution</td>
<td>$\sigma^2 = np(1-p)$</td>
</tr>
<tr>
<td>Standard deviation of the Binomial Distribution</td>
<td>$\sigma = \sqrt{np(1-p)}$</td>
</tr>
<tr>
<td>Normal approximation of the Binomial Distribution</td>
<td>$z = \frac{x - np}{\sqrt{npq}}$</td>
</tr>
<tr>
<td>Mean of the Uniform Distribution</td>
<td>$\mu = \frac{a+b}{2}$</td>
</tr>
<tr>
<td>Variance of the Uniform Distribution</td>
<td>$\sigma^2 = \frac{(b-a)^2}{12}$</td>
</tr>
<tr>
<td>Standard deviation of the Uniform Distribution</td>
<td>$\sigma = \sqrt{\frac{(b-a)^2}{12}}$</td>
</tr>
<tr>
<td>Uniform Distribution: Probability of $x$</td>
<td>$p(x) = \frac{1}{b-a} (H-L)$</td>
</tr>
<tr>
<td>Standard normal distribution</td>
<td>$z = \frac{x - \mu}{\sigma}$</td>
</tr>
<tr>
<td>Variance of a sampling distribution</td>
<td>$\sigma^2_x = \frac{\sigma^2}{n}$</td>
</tr>
<tr>
<td>Standard deviation of a sampling distribution</td>
<td>$\sigma_x = \frac{\sigma}{\sqrt{n}}$</td>
</tr>
<tr>
<td>Sample error</td>
<td>$SE = \bar{x} - \mu$</td>
</tr>
<tr>
<td>Sample size</td>
<td>[ n = \left( \frac{z \cdot \sigma}{E} \right)^2 ] or [ n = \left( \frac{t \cdot s}{E} \right)^2 ]</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Confidence interval</td>
<td>[ \overline{x} \pm z \cdot \frac{\sigma}{\sqrt{n}} ] or [ \overline{x} \pm t \cdot \frac{s}{\sqrt{n}} ]</td>
</tr>
</tbody>
</table>
ANSWER KEY

1. B
2. C
3. B
4. A
5. B
6. C
7. C
8. D
9. C
10. D
11. D
12. C
13. D
14. B
15. D
16. B
17. C
18. D
19. C
20. C
21. B
22. D
23. C
24. D
25. B
26. D
27. A
28. C
29. D
30. D