Choose the best answer from a, b, c, d

1) Which of the following approaches to probability bases its outcomes on observed data?

a) Classical approach	b) Relative frequency distribution
c) subjective probability	d) all of the above

2) Which of the following best expresses the General Addition Rule?

a) P (A or B) = P(A) + P(B) + P (A and B)	b) P (A or B) = P(A) + P(B)
c) P (A or B) = P(A) + P(B) - P(A and B)	d) None of the above.

3) The probability of a price increase is 0.24 (24%) whereas the probability of a price decrease is 0.05 (5%). What is the probability that there will be either a price increase or a decrease?

a) 0.19	b) 0.012
c) 0.29	d) 0.2083

If we are selecting only one card from a standard deck of 52 playing cards, for q4, q5

4) The probability of picking either a club or a diamond would be:

a) 30/52 = 0.58	b) 26/52 = 0.50
c) 13/52 = 0.25	d) None of the above.

5) The probability of picking a red queen would be _____.

a) 2/52 = 0.038	b) 2/26 = 0.077
c) 1/52 = 0.019	d) 4/26 = 0.154

6) Probability of failure in binomial distribution is denoted by

a) $p = q + 1$	b) $p = q - 1$
c) $q = 1 + p$	d) $q = 1 - p$

7) Mean of binomial probability distribution is 857.6 and the probability is 64% then the number of values of binomial distribution (n)is

a) 1040	b) 1340
c) 1240	d) 1140

8) Whenever P(Success) = 0.50, the shape of a given binomial distribution will be:

a) symmetrical, regardless of the number of trials	b) skewed to the right.
c) symmetrical, but only if the number of trials is large.	d) skewed to the left.

9) In question 8

a) The mean is the same as mode	b) The mean is greater than the mode
c) The mean is less than the mode	d) Cannot study the relation between the averages

10) If the probability of a success is 0.80, and there is n=10 trials, the standard deviation of the binomial distribution is

a) 8.00	b) 1.26
c) 0.80	d) 1.60

11) If the outcomes of a discrete random variable follow a Poisson distribution, then their ….

a) mean equals the variance of that discrete random variable.	b) mean equals the standard deviation.
c) median equals the standard deviation.	d) median equals the variance.

12) Poisson distribution is applied for _____

a) Continuous Random Variable	b) Discrete Random Variable
c) Irregular Random Variable	d) Mixture Random Variable

13) If 'm' is the mean of Poisson Distribution, the P(0) is given by _____

a) e^{-m}	b) e^{m}
c) e	d) m^{-e}

14) X is a binomial random variable with n=10 and p=0.9. Which of the following statements is false?

a) $P(1 < X < 5) = P(2 \leq X \leq 4)$	b) $P(X \leq 5) = 1 - P(X \geq 5)$
c) $\mu = 9$	d) $\sigma = 0.9487$

15) At Ingles Market is has been determined that customers arrive at the checkout section according to a Poisson distribution at an average rate of 12 customers per hour. What is the probability that at least 1 customer will arrive at the checkout section in the next hour?

a) $\dfrac{e^{-12}12^{1}}{1!}$	b) $1 - \dfrac{e^{-12}12^{0}}{0!}$
c) $\dfrac{e^{-12}12^{0}}{0!}$	d) $\dfrac{e^{-1}}{1!}$

16) Suppose that on average, 5 students who are enrolled in a state university in Atlanta, GA have their cars stolen during the semester and the number of cars has a Poisson distribution. Determine the expected number of cars stolen per semester.

a) $\sqrt{5}$ cars	b) 5 cars

c) 25 cars	d) none of these

17) A special coin has the probability of 0.65 of landing heads. What is the probability that it will land heads exactly 3 times in 7 tosses?

a) $_7C_3(0.65)^3(0.35)^4$	b) $\dfrac{0.65^3 e^{-0.65}}{3!}$

c) $_7C_0(0.65)^0(0.35)^7 + \ _7C_1(0.65)^1(0.35)^6 + \ _7C_2(0.65)^2(0.35)^3 + \ _7C_3(0.65$

d) $\dfrac{0.65^0 e^{-0.65}}{0!} + \dfrac{0.65^1 e^{-0.65}}{1!} + \dfrac{0.65^2 e^{-0.65}}{2!} + \dfrac{0.65^3 e^{-0.65}}{3!}$

18) The time that it takes a Clemson student to find parking once they have arrived on campus is approximately normally distributed with a mean 25 minutes and standard deviation 5 minutes. If a student arrives on campus at 8:15 AM, what is the probability that the student will find parking before 8:45 AM?

a) 0.1587	b) 0.7881
c) 0.8413	d) 0.3413

19) The height of an adult male is known to be normally distributed with mean of 175 cm and standard deviation 6 cm. What is the value of Q3 (third quartile) in this distribution of heights?

a) 0.6745 cm	b) 170.95 cm
c) 179.02 cm	d) 182.34 cm

20) A machine that cuts corks for liquid bottles operates in such a way that the distribution of the diameter of the corks produced is well approximated by a normal distribution with mean 3 cm and standard deviation 0.1 cm. The specifications call for corks with diameters between 2.9 and 3.1 cm. A cork not meeting specifications is considered defective. What proportion of corks will be considered defective?

a) 0.1587	b) 0.3173
c) 0.3413	d) 0.6826

21) What's the critical z-value for an 85% confidence interval?

a) .8023	b) 1.44
c) 1.04	d) Can't be determined without knowing the sample size

A confidence interval was used to estimate the proportion of statistics students that are female. A random sample of 72 statistics students generated the following 90% confidence interval: (0.438, 0.642). Using the information above, q22: q27

22) This confidence interval was constructed using the following distribution

a) Normal distribution	b) T distribution
c) Binomial distribution	d) Poisson distribution

23) The degrees of freedom for this distribution is

a) 71	b) 70
c) 100	d) Not applicable

24) The value of the distribution which was used in this interval is

a) 1.664	b) 1.65
c) 0.05	d) 0.1

25) The pointestimate of the proportion in this case is

a) 0.438	b) 0.642
c) 0.54	d) None of the above

26) what the most conservative estimate of the sample size n if we wanted to estimate the true proportion to within ±0.08 using 95% confidence?

a) 106	b) 107
c) 151	d) None of the above

27) what size sample would be necessary if we wanted to estimate the true proportion to within ±0.08 using 95% confidence and the above confidence interval?

a) 597	b) 420
c) 150	d) 149

A sample of 50 students was taken from the local university. These students spent an average of $170 on books this semester, with a standard deviation of $25.50. A 95% confidence interval for the average spent on books for all students would be estimated using this information.(For q28 to q35)

28) The distribution which is used in this estimation is …….

a) Binomial distribution	b) Poisson distribution
c) Normal distribution	d) T distribution

29) The degrees of freedom for this distribution are…….

a) 49	b) 169
c) 50	d) Not applicable

30) The distribution value that will be used in this case is …….

a) 1.65	b) 1.96
c) 2.009	d) None of the above

31) A point estimate for the population mean is

a) 25.5	b) 50
c) 170	d) None of the above

32) What is the standard deviation of the sample mean?

a) 25.5	b) 50
c) 3.61	d) 650.25

33) The margin of error of this estimate is

a) ±7.07	b) ±3.61
c) ±25.5	d) None of the above

34) The confidence interval for the average spent on books for all students would be _____.

a) 170 plus or minus 3.61	b) 170 plus or minus 25.5
c) 170 plus or minus 8.42	d) None of the above.

35) Suppose you compute a 99% confidence interval using the same information. Which of the following statements is correct?

a) The intervals have the same width.	b) The 99% interval is shorter.
c) The 99% interval is longer.	d) None of the above.

36) To test a hypothesis involving proportions, both np and n(1-p) should

a) Be at least 30	b) Be greater than 5
c) Lie in the range from 0 to 1	d) There are no specific conditions surrounding the values of n and p

For a two-tailed hypothesis test on a population mean when alpha is 5%, the sample size is 20 and thepopulation standard deviation is known, answer q37 to 39

37) What is the distribution you use to find this critical value?

a) Binomial distribution	b) Poisson distribution
c) Normal distribution	d) T distribution

38) What are the degrees of freedom you use to find this critical value in this case?

a) n-1	b) n+1
c) n-2	d) not applicable

39) What is the critical value?

a) 1.96	b) 1.65
c) 2.093	d) 2.58

40) Which of the following would be an appropriate alternative hypothesis for a one-tail test?

a) The sample proportion is not less than 0.65.	b) The population proportion is less than 0.65.
c) The population proportion is not less than 0.65.	d) The sample proportion is less than 0.65.

41) The quantity (1 - alpha) is called:

a) the power of the test.	b) the probability of Type I error.
c) the probability of Type II error.	d) the confidence level.

42) In a hypothesis test involving a population mean, which of the following would be an acceptable formulation?

a) $H_o : \bar{x} \leq \$1,700$ $H_a : \bar{x} > \$1,700$	b) $H_o : \mu > \$1,700$ $H_a : \mu \geq \$1,700$
c) $H_o : \mu \leq \$1,700$ $H_a : \mu > \$1,700$	d) None of the above is a correct formulation

43) If an economist wishes to determine whether there is evidence that average family income in a community exceeds $25,000. The best null hypothesis is:

a) $\mu \neq 25,000$	b) $\mu > 25,000$
c) $\mu \leq 25,000$	d) $\mu \geq 25,000$

44) The reason for using the t-distribution in a hypothesis test about the population mean is:

a) the population standard deviation is unknown	b) it results in a lower probability of a Type I error occurring.
c) it provides a smaller critical value than the standard normal distribution for a given sample size.	d) the population is not normally distributed

A company that makes shampoo wants to test whether the average amount of shampoo per bottle is 16 ounces. The standard deviation for this product is known to be 0.20 ounces.

Assuming that the hypothesis test is to be performed using 0.10 level of significance and a random sample of n = 24 bottles (use this for q45: q48)

45) What is the distribution which we use to get the critical value?

a) binomial	b) Poisson
c) normal	d) t distribution

46) The degrees of freedom in this case is

a) 23	b) 24
c) 15	d) Not applicable

47) which of the following would be the upper tail critical value?

a) 1.319	b) 1.645
c) 1.96	d) None of the above

48) which of the following would be the correct formulation of the null and alternative hypotheses?

a) $H_o : \bar{x} = 16$ $H_A : \bar{x} \neq 16$	b) $H_o : \mu = 16$ $H_A : \mu \neq 16$
c) $H_o : \mu \geq 16$ $H_A : \mu < 16$	d) $H_o : \bar{x} \geq 16$ $H_A : \bar{x} < 16$

A statistician wishes to determine if there is a difference between two population means. A sample of 10 items from Population #1 yields a mean of 185 with a standard deviation of 20. The sample of 12 items from Population #2 yields a mean of 200 with a standard deviation of 25. Assume that the values are normally distributed in each population. Use significant level 5%.(q49:q56)

49) What is the distribution which we use to get the critical value?

a) Binomial distribution	b) Poisson distribution
c) Normal distribution	d) T distribution

50) How many degrees of freedom are there for this test?

a) 20	b) 21
c) 22	d) Not applicable

51) What is the critical value?

a) 1.96	b) 2.086
c) 2.08	d) 1.725

52) What is the pooled variance?

a) 22.89	b) 92.08

c) 9.6	d) 524

53) What is the alternate hypothesis?

a) H_1: μ_1 not equal to μ_2	b) H_1: $\mu_1 < \mu_2$
c) H_1: $\mu_1 > \mu_2$	d) H_1: $\mu_1 = \mu_2$

54) $S_{\bar{x}_1 - \bar{x}_2} =$

a) 9.8	b) 224.36
c) 39.42	d) None of the above

55) The test statistics is given by

a) $\dfrac{\bar{x}_1 - \bar{x}_2}{S_p\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$	b) $\dfrac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$
c) $\dfrac{\bar{x}_1 + \bar{x}_2}{S_p\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$	d) $\dfrac{\bar{x}_1 + \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$

56) The decision for this test is

a) Reject the null hypothesis	b) Accept the null hypothesis
c) Can't decide	d) None of the above

57) If you are testing a hypothesis that two population proportions are the same, you should do which of the following?

a) Use a sample proportion equal to 0.5.	b) Calculate a pooled value for the sample proportion.
c) Use a 0.05 level of significance.	d) Average the two sample proportions.

58) When comparing two population proportions, what is the null hypothesis if the alternate hypothesis is $p_1 > p_2$?

a) H_0: $p_1 < p_2$	b) H_0: $p_1 = p_2$
c) H_0: p_1 not equal to p_2	d) H_0: $p_1 > p_2$

The water diet requires you to drink 2 cups of water every half hour from when you get up until you go to bed but eat anything you want. Four adult volunteers agreed to test this diet. They are weighed prior to beginning the diet and 6 weeks after. Their weights in pounds are

Person	1	2	3	4
Weight before	180	125	240	150
Weight after	170	130	215	152

We want to test if there is a different in weights before and after diet at 1% significant level. Use this information to answer questions q59:q65

59) What is the alternate hypothesis?

a) H_1: μ_1 not equal to μ_2	b) H_1: μ_1 equals μ_2
c) H_1: $\mu_1 > \mu_2$	d) H_1: $\mu_1 < \mu_2$

60) What is the distribution which we use to get the critical value?

a) Binomial distribution	b) Poisson distribution
c) Normal distribution	d) T distribution

61) How many degrees of freedom are there for this test?

a) 3	b) 7
c) 4	d) Not applicable

62) What is the critical value?

a) 2.58	b) 2.086
c) 1.96	d) None of the above

63) The mean of differences in weights is

a) 173.75	b) 166.75
c) 10	d) 7

64) The standard deviation for differences in weights is

a) 49.56	b) 36.09
c) 25	d) 13.64

65) The test statistics is calculated as

a) $\dfrac{\bar{x}_1 - \bar{x}_2}{S_p\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$	b) $\dfrac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1}+\frac{S_2^2}{n_2}}}$
c) $\dfrac{\bar{d}}{S_n/\sqrt{n}}$	d) None of the above