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Marks	18.00/25.00
Grade	**7.20** out of 10.00 (**72**%)

Question **1**

Incorrect

Mark 0.00 out of 1.00

[7-54] A user of a certain gauge of steel wire suspects that the variance of its breaking strength, in newton (N), is different from the value of 0.5625 as specified by the manufacturer. Consequently the users test the breaking strength of each of a random sample of 9 lengths of wire and see that the sample variance is 0.7. Assume that breaking strength to be normally distributed, test, the claim that the variance is smaller than 0.5625. What is the P-value?

Select one:

- 0.752.
- 0.762. ✖
- 0.732.
- 0.742.

The correct answer is: 0.732.

Question **2**

Correct

Mark 1.00 out of 1.00

[5-14] An electronic company manufactures resistors that have a mean resistance of 100 ohms and a standard deviation of 10 ohms. We are ready detemine the distribution of the sample mean of 25 resistors having a resistance. The mean is ____, and the variance is _____.

Select one:

- 25; and 2
- 100; and 4 ✔
- 10; and 4
- 100; and 10

The correct answer is: 100; and 4

Question **3**

Correct

Mark 1.00 out of 1.00

[5-10] Two different box-filling machines are used to fill cereal boxes on an assembly line. The critical measurement influenced by these machines is the weight of the product in the boxes. Engineers are quite certain that the variance of the weight of product is 25 ounce. Both of two means are the same. Experiments are conducted using both machines with sample sizes of 50 each. Engineers are surprised that the two sample averages for the filling machines are so different.

Select one:

- The difference in sample means is normal distribution with the mean of zero
- The difference in sample means is normal distribution in general
- The difference in sample means is exactly standard normal distribution ✔
- The difference in sample means is normal distribution with the standard deviation of one

The correct answer is: The difference in sample means is exactly standard normal distribution

Question **4**

Correct

Mark 1.00 out of 1.00

[5-07] The mean weight of men in a nation is 78.5 kg with a standard deviation of 11.2 kg. We randomly select 20 men from the nation and let X' be the average weight of these 20 people (i.e. sample mean). Find the probability that X' is greater than 82 kg.

Select one:

- 0.081 ✔
- 0.919
- 0.182
- 0.344

The correct answer is: 0.081

Question **5**

Correct

Mark 1.00 out of 1.00

[5-26] Scores of final exam in Math has a normal distribution with mean of 73 and standard deviation 7.8. If 24 students are randomly selected, find the probability that the mean of their test scores is less than 70. Let P(Z < -1.884)=0.0297 and P(Z > 1.884)=0.9702.

- a. 0.014
- b. 0.024
- c. 0.048
- d. 0.030 ✔

The correct answer is:
0.030

Question **6**

Correct

Mark 1.00 out of 1.00

[7-62] The test statistic in a two-tailed test is z=1.55. Let $P(Z<1.55) = 0.940$. Then the P-value is _____

- a. 0.060
- b. 0.121 ✔
- c. 0.940
- d. 0.062

The correct answer is:
0.121

Question **7**

Correct

Mark 1.00 out of 1.00

[6-46] A university conducted a study to see how much money a student spends on average phone calls in a month. A random survey of 59 students gave an average of $41.05 with a standard deviation of $27.99. Construct a 95% confidence interval for the monthly average cost of phone calls of students.

Select one:

- (33.18; 48.92)
- (33.92; 48.18) ✔
- (33.92; 48.92)
- (33.18; 48.18)

The correct answer is: (33.92; 48.18)

Question **8**

Correct

Mark 1.00 out of 1.00

[6-58] In a survey of 5100 T.V viewers, 2040 viewers said they watch network news programs. How large must the sample be if we wish to be at least 93% confident that the error in estimating the true value of p is less than 0.02, regardless of the true values of p?

Select one:

- 3970
- 2170
- 5100
- 1970 ✔

The correct answer is: 1970

Question **9**

Incorrect

Mark 0.00 out of 1.00

[7-44] Find the critical value based on the given information: $H1: \sigma<0.629; n = 19; \alpha = 0.025.$

Select one:

- 8.13
- 8.23
- 8.33 ✖
- 8.32

The correct answer is: 8.23

Question **10**

Correct

Mark 1.00 out of 1.00

[6-14]

The breaking strength of yarn used in manufacturing drapery material is required to be at 100 psi. Past experience has indicated that breaking strength is normally distributed and t = 2 psi. A random sample of nine specimens is tested and the average breaking streng found to be 98 psi. Find a 95% two-sided confidence interval on the true mean brea strength.

Select one:

- (96.69; 99.09)
- (96.90; 99.09)
- (96.90; 99.31)
- (96.69; 99.31) ✔

The correct answer is: (96.69; 99.31)

Question **11**

Correct

Mark 1.00 out of 1.00

[6-50] A major tire manufacturer wishes to estimate the mean tread life in miles for one of their tires. They wish to develop a confidence interval estimate that would have a maximum sampling error of 500 miles with 90 percent confidence. Let population standard deviation equal to 4,000 miles. Based on this information, the required sample size is _____. Let $z_{0.05} = 1.645$

Select one:

- 246
- 174 ✔
- 196
- 124

The correct answer is: 174

Question **12**

Correct

Mark 1.00 out of 1.00

[6-18] Given $s = 4.7$, and $n = 18$, form a 99% confidence interval for σ^2. Let $\chi^2_{0.005;17} = 35.72; \chi^2_{0.995;17} = 5.70$

Select one:

- (10.51; 65.88) ✔
- (10.51; 58.61)
- (11.24; 58.61)
- (11.24; 65.88)

The correct answer is: (10.51; 65.88)

Question **13**

Incorrect

Mark 0.00 out of 1.00

[7-50] Various temperature measurements were recorded at different times for a particular city. One believes that the true temperature mean is 22 deg C. You doubt this claim and obtained the mean of 23.7 deg C for 18 temperatures on 18 different days with the sample standard deviation is 3 deg C. Test the claim that the true temperature mean is different to 22 deg C. What is the P-value?

Select one:

- 0.027
- 0.026
- 0.030 ✖
- 0.028

The correct answer is: 0.028

Question **14**

Correct

Mark 1.00 out of 1.00

[7-30] The life in hours of a battery is known to be approximately normally distributed, with standard deviation of 1.25 hours. A random sample of 10 batteries has a mean life of 40.5 hours. Test the claim that battery life exceeds 40 hours with significance level of 0.05?

Select one:

- Reject the claim that battery life is 40 hours
- Fail to reject the claim that battery life is 40 hours ✔
- None of them
- There is sufficent evidence to conclude that battery life exceeds 40 hours

The correct answer is: Fail to reject the claim that battery life is 40 hours

Question **15**

Incorrect

Mark 0.00 out of 1.00

[7-31] The life in hours of a battery is known to be approximately normally distributed, with standard deviation of 1.25 hours. A random sample of 10 batteries has a mean life of 40.5 hours. We want to support the claim that battery life exceeds 40 hours with significance level of 0.05? What is the type II error probability if the true mean life is 41.5 hours?

Select one:

- 0.016
- 0.020
- 0.010 ✖
- 0.026

The correct answer is: 0.016

Question **16**

Correct

Mark 1.00 out of 1.00

[6-55] Suppose a 95% confidence interval for μ turns out to be (1000, 2100). To make more useful inferences from the data, it is desired to reduce the width of the confidence interval. Which of the following will result in a reduced interval width?

Select one:

- Increase the confidence level.
- Increase the sample mean.
- Increase the sample size. ✔
- Increase the population mean.

The correct answer is: Increase the sample size.

Question **17**

Incorrect

Mark 0.00 out of 1.00

[7-10] The cost of a college education has increased at a much faster rate than costs in general over the past twenty years. In order to compensate for this, many students work part- or full-time in addition to attending classes. At one university, it is believed that the average hours students work per week exceeds 20. To test this at a significance of 0.05, a random sample of n=20 students was selected. Find the critical value. Let $t_{0.025,19} = 2.09$ and $t_{0.05,19} = 1.73$

Select one:

- none of them.
- cannot be determined without knowing the population standard deviation.
- is equal to 2.09 ✖
- is equal to 1.73.

The correct answer is: is equal to 1.73.

Question **18**

Correct

Mark 1.00 out of 1.00

[6-54] A confidence interval was used to estimate the proportion of statistics students that are females. A random sample of 72 statistics students generated the following 90% confidence interval: (0.438; 0.642). Based on the interval above, is the population proportion of females equal to 0.60?

Select one:

- No, and we are 90% sure of it.
- Yes, and we are 90% sure of it.
- Maybe. 0.60 is a believable value of the population proportion based on the information above. ✔
- No. The proportion is 54.17%.

The correct answer is: Maybe. 0.60 is a believable value of the population proportion based on the information above.

Question **19**

Correct

Mark 1.00 out of 1.00

[6-43] Given that the standard deviation for adult height is 3 inches , we want to construct a 90% confidence interval for mean height with an error of no more than 0.5 inches. What is the minimum sample size to achieve the above requirement?

Select one:

- approximately 105
- approximately 95
- approximately 98 ✔
- approximately 101

The correct answer is: approximately 98

Question **20**

Incorrect

Mark 0.00 out of 1.00

[5-17] Suppose that a random variable X has a continuous uniform distribution as follows. We get 10 random numbers in the segment [4; 6] and call X' be the average of them. Find the variance of X'. $f(x) = \begin{cases} 1/2, & 4 \le x \le 6 \\ 0, & \text{otherwise} \end{cases}$

Select one:

- 0.528872
- 0.02887 ✖
- 0.005834
- 0.00083

The correct answer is: 0.00083

Question **21**

Correct

Mark 1.00 out of 1.00

[7-08] When a new drug is created, the pharmaceutical company must subject it to testing before receiving the necessary permission from the Food and Drug Administration (FDA) to market the drug. Suppose the null hypothesis is "the drug is unsafe." What is the Type II Error?

Select one:

- To claim the drug is unsafe when, in fact, it is unsafe
- To claim the drug is unsafe when, in fact, it is safe. ✔
- To claim the drug is safe when, in fact, it is unsafe
- To claim the drug is safe when, in fact, it is safe

The correct answer is: To claim the drug is unsafe when, in fact, it is safe.

Question **22**

Correct

Mark 1.00 out of 1.00

[5-02] If the true proportion of voters who support candidate A is p = 0.6, what is the probability that a sample of size 200 yields a sample proportion between 60% and 65%?

Select one:

- 0.42 ✔
- 0.50
- 0.07
- 0.48

The correct answer is: 0.42

Question **23**

Incorrect

Mark 0.00 out of 1.00

[7-58] Assume that the data has a normal distribution and the number of observations is greater than 50. Find the critical z value used to test a null hypothesis. $\alpha = 0.07$ for a test H_1: $\mu > \mu_0$.

Select one:

- -1.812
- 1.812 ✖
- 1.476
- -1.476

The correct answer is: 1.476

Question **24**

Correct

Mark 1.00 out of 1.00

[5-21] A new method of measuring the thermal conductivity of Armco iron: Using a temperature of 100 deg F and a power input of 550 watts, the following 8 measurements of thermal conductivity (in Btu/hr-ft- deg F) were obtained the following: 41.60; 41.48; 42.34; 41.95; 41.86; 42.18; 41.72; and 42.26. Find a point estimate of the mean thermal conductivity at 100 deg F and 550 watts. Then, find its estimated standard error.

Select one:

- The mean is 41.924 and the estimated standard error is 0.105
- The mean is 41.924 and the estimated standard error is 0.100
- The mean is 41.924 and the estimated standard error is 0.1118 ✔
- The mean is 41.924 and the estimated standard error is 0.316

The correct answer is: The mean is 41.924 and the estimated standard error is 0.1118

Question **25**

Correct

Mark 1.00 out of 1.00

[5-19] A cell phone company finds those who go over their data limit, go over by on average of 3 GB with a standard deviation of 0.5 GB. You conduct a survey of 50 customers. Find the standard deviation of the average overage distribution.

Select one:

- 0.071 ✔
- 0.500
- 0.051
- 0.005

The correct answer is: 0.071

◄ Slide fu

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