* **Question 1**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A sample of 20 cans of tomato juice showed a standard deviation of .4 ounces. A 95% confidence interval estimate of the **variance** for the population is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  .0925 to .3413. | | Answers: | a.  .3042 to .5843. | |  | b.  .2313 to .8533. | |  | c.  .2224 to .7924. | |  | d.  .0925 to .3413. | |  |  |  |

* **Question 2**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | There is a .90 probability of obtaining a value such that ​ |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | b.  ​ ≤  ≤ ​. | | Answers: | a.  ​ <  < ​. | |  | b.  ​ ≤  ≤ ​. | |  | c.  ​ <  < ​. | |  | d.   ≤  ≤ ​. | |  |  |  |

* **Question 3**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The chi-square value for a one-tailed (upper tail) hypothesis test at a 5% level of significance and a sample size of 25 is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | c.  36.415. | | Answers: | a.  33.196. | |  | b.  39.364. | |  | c.  36.415. | |  | d.  37.652. | |  |  |  |

* **Question 4**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | = 8.231 indicates that​ |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  ​97.5% of the chi-square values are greater than 8.231. | | Answers: | a.  ​97.5% of the chi-square values are less than 8.231. | |  | b.  ​2.5% of the chi-square values are greater than 8.231. | |  | c.  5% of the chi-square values are equal to 8.231. | |  | d.  ​97.5% of the chi-square values are greater than 8.231. | |  |  |  |

* **Question 5**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The contents of a sample of 26 cans of apple juice showed a standard deviation of .06 ounces. We are interested in testing whether the variance of the population is significantly more than .003. At the .05 level of significance, the null hypothesis |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | b.  should not be rejected. | | Answers: | a.  should be rejected. | |  | b.  should not be rejected. | |  | c.  should be revised. | |  | d.  should not be tested. | |  |  |  |

* **Question 6**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The manager of the service department of a local car dealership has noted that the service times of a sample of 30 new automobiles has a standard deviation of 6 minutes. A 95% confidence interval estimate for the standard deviation of the service times (in minutes) for all their new automobiles is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | b.  4.778 to 8.066. | | Answers: | a.  22.833 to 65.059. | |  | b.  4.778 to 8.066. | |  | c.  16.047 to 45.722. | |  | d.  2.93 to 6.31. | |  |  |  |

* **Question 7**

0 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The chi-square value for a one-tailed (lower tail) test when the level of significance is .1 and the sample size is 15 is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  21.064. | | Answers: | a.  6.571. | |  | b.  23.685. | |  | c.  7.790. | |  | d.  21.064. | |  |  |  |

* **Question 8**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Consider the following hypothesis problem.  ​   |  |  |  | | --- | --- | --- | | *n* = 23 | *s*2 = 60 | *H*0: *σ*2 ≤ 66 | | *H*a: *σ*2 > 66 |   ​  The *p*-value is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  greater than .10. | | Answers: | a.  between .025 and .05. | |  | b.  less than .025. | |  | c.  between .05 and .10. | |  | d.  greater than .10. | |  |  |  |

* **Question 9**

0 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | ​Consider the following sample information from Population A and Population B.  ​   |  |  |  | | --- | --- | --- | | ​ | Sample A | Sample B | | *n* | 24 | 16 | | *s*2 | 32 | 38 |   ​​  We want to test the hypothesis that the population variances are equal. The test statistic for this problem equals |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | b.  .84. | | Answers: | a.  ​.67. | |  | b.  .84. | |  | c.  ​1.50. | |  | d.  ​1.19. | |  |  |  |

* **Question 10**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | ​Consider the following sample information from Population A and Population B.  ​   |  |  |  | | --- | --- | --- | | ​ | Sample A | Sample B | | *n* | 24 | 16 | | *s*2 | 32 | 38 |   ​​  We want to test the hypothesis that the population variances are equal. At the 10% level of significance, the null hypothesis |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  ​should not be rejected. | | Answers: | a.  ​should be revised. | |  | b.  should not be tested. | |  | c.  should be rejected. | |  | d.  ​should not be rejected. | |  |  |  |

* **Question 11**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Which of the following has a chi-square distribution? |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  (*n* - 1)*s*2/*σ*2. | | Answers: | a.  (*n* - 1)*σ*2/*s*2. | |  | b.  (*n* - 1)*σ*/*s*. | |  | c.  (*n* - 1)*s*/*σ*. | |  | d.  (*n* - 1)*s*2/*σ*2. | |  |  |  |

* **Question 12**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The value of *F* .05 with 8 numerator and 19 denominator degrees of freedom is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  2.48. | | Answers: | a.  2.48. | |  | b.  2.96. | |  | c.  2.58. | |  | d.  3.63. | |  |  |  |

* **Question 13**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The producer of a certain medicine claims that their bottling equipment is very accurate and that the standard deviation of all their filled bottles is .1 ounces or less. A sample of 20 bottles showed a standard deviation of .11 ounces. The test statistic to test the claim is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  22.99. | | Answers: | a.  22.99. | |  | b.  2.3. | |  | c.  4.85. | |  | d.  24.2. | |  |  |  |

* **Question 14**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | ​Consider the following hypothesis problem.     |  |  | | --- | --- | | *n* = 14 | *H*0: *σ*2 < 410 | | *s* = 20 | *H*a: *σ*2 > 410 |   ​  ​The null hypothesis is to be tested at the 5% level of significance. The critical value(s) from the chi-square distribution table is(are) |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  22.362. | | Answers: | a.  ​5.629 and 26.119. | |  | b.  ​5.009 and 24.736. | |  | c.  ​23.685. | |  | d.  22.362. | |  |  |  |

* **Question 15**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The contents of a sample of 26 cans of apple juice showed a standard deviation of .06 ounces. We are interested in testing whether the variance of the population is significantly more than .003. The null hypothesis is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | b.  *σ*2 ≤ .003. | | Answers: | a.  *s*2 ≤ .003. | |  | b.  *σ*2 ≤ .003. | |  | c.  *σ*2 > .003. | |  | d.  *s*2 > .003. | |  |  |  |

* **Question 16**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A sample of 21 elements is selected to estimate a 90% confidence interval for the variance of the population. The chi-square value(s) to be used for this interval estimation is(are) |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  10.851 and 31.410. | | Answers: | a.  10.851 and 31.410. | |  | b.  31.410. | |  | c.  12.443 and 28.412. | |  | d.  12.443. | |  |  |  |

* **Question 17**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | For an *F* distribution, the number of degrees of freedom for the numerator |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | c.  can be larger, smaller, or equal to the number of degrees of freedom for the denominator. | | Answers: | a.  must be larger than the number of degrees of freedom for the denominator. | |  | b.  must be equal to the number of degrees of freedom for the denominator. | |  | c.  can be larger, smaller, or equal to the number of degrees of freedom for the denominator. | |  | d.  must be smaller than the number of degrees of freedom for the denominator. | |  |  |  |

* **Question 18**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The symbol used for the variance of the sample is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  *s*2. | | Answers: | a.  *s*. | |  | b.  *σ*2. | |  | c.  *σ*. | |  | d.  *s*2. | |  |  |  |

* **Question 19**

0 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | To avoid the problem of not having access to tables of the *F* distribution when a one-tailed test is required and with *F* values given for the lower tail, let​ the |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | c.  larger sample variance be the numerator of the test statistic. | | Answers: | a.  sample variance from the population with the smaller hypothesized variance be the numerator of the test statistic. | |  | b.  smaller sample variance be the numerator of the test statistic. | |  | c.  larger sample variance be the numerator of the test statistic. | |  | d.  sample variance from the population with the larger hypothesized variance be the numerator of the test statistic. | |  |  |  |

* **Question 20**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A sample of 28 elements is selected to estimate a 95% confidence interval for the variance of the population. The chi-square values to be used for this interval estimation are​ |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  ​14.573 and 43.195. | | Answers: | a.  ​14.573 and 43.195. | |  | b.  11.808 and 49.645. | |  | c.  ​16.151 and 40.113. | |  | d.  ​15.308 and 44.461. | |  |  |  |

* **Question 21**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The contents of a sample of 26 cans of apple juice showed a standard deviation of .06 ounces. We are interested in testing whether the variance of the population is significantly more than .003. The *p*-value for this test is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  greater than .10. | | Answers: | a.  .05. | |  | b.  less than .10. | |  | c.  zero. | |  | d.  greater than .10. | |  |  |  |

* **Question 22**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | ​In practice, the most frequently encountered hypothesis test about a population variance is a |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  ​one-tailed test, with rejection region in the upper tail. | | Answers: | a.  ​one-tailed test, with rejection region in the upper tail. | |  | b.  ​two-tailed test, with unequal-size rejection regions. | |  | c.  ​two-tailed test, with equal-size rejection regions. | |  | d.  ​one-tailed test, with rejection region in the lower tail. | |  |  |  |

* **Question 23**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | ​Consider the following hypothesis problem.     |  |  | | --- | --- | | *n* = 14 | *H*0: *σ*2 < 410 | | *s* = 20 | *H*a: *σ*2 > 410 |   ​  ​The test statistic equals |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  ​12.68. | | Answers: | a.  ​12.68. | |  | b.  ​13.33. | |  | c.  ​13.68. | |  | d.  .63. | |  |  |  |

* **Question 24**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | We are interested in testing to see if the variance of a population is less than 7. The correct null hypothesis is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | b.  *σ*2 ≥ 7. | | Answers: | a.  *σ* < 7. | |  | b.  *σ*2 ≥ 7. | |  | c.  *σ* < 49. | |  | d.  *σ*2 ≥ 49. | |  |  |  |

* **Question 25**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The critical value of *F* using  *α* = .05 when there is a sample size of 21 for the sample with the smaller variance, and there is a sample size of 9 for the sample with the larger sample variance is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  2.45. | | Answers: | a.  2.45. | |  | b.  2.37. | |  | c.  2.10. | |  | d.  2.94. | |  |  |  |

* **Question 26**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Based on the sample evidence below, we want to test the hypothesis that population A has a larger variance than population B.  ​   |  |  |  | | --- | --- | --- | |  | **Sample A** | **Sample B** | | *n* | 11 | 10 | | *s*2 | 12.1 | 5 |   ​  The *p*-value is approximately |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  .10. | | Answers: | a.  .10. | |  | b.  .025. | |  | c.  .01. | |  | d.  .05. | |  |  |  |

* **Question 27**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | We are interested in testing whether the variance of a population is significantly less than 1.44. The null hypothesis for this test is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  *H*0: *σ*2 ≥ 1.44. | | Answers: | a.  *H*0: *σ*2 ≥ 1.44. | |  | b.  *H*0: *s*2 ≥ 1.44. | |  | c.  *H*0: *σ*2 < 1.44. | |  | d.  *H*0: *σ* < 1.20. | |  |  |  |

* **Question 28**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | Consider the following hypothesis problem.  ​   |  |  |  | | --- | --- | --- | | *n* = 23 | *s*2 = 60 | *H*0: *σ*2 ≤ 66 | | *H*a: *σ*2 > 66 |   ​  If the test is to be performed at the 5% level, the critical value(s) from the chi-square distribution table is(are) |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | b.  33.924. | | Answers: | a.  10.982 and 36.781. | |  | b.  33.924. | |  | c.  12.338. | |  | d.  12.338 and 33.924. | |  |  |  |

* **Question 29**

0.5 out of 0.5 points

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| --- | --- | --- | --- | --- |
|  |  | | | |
|  | ​Consider the following hypothesis problem.     |  |  | | --- | --- | | *n* = 30 | *H*0: *σ*2 = 500 | | *s*2 = 625 | *H*a: *σ*2 ≠ 500 |   ​  ​The null hypothesis is to be tested at the 5% level of significance. The critical value(s) from the chi-square distribution table is(are) |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  ​16.047 and 45.722. | | Answers: | a.  ​16.791 and 46.979. | |  | b.  ​43.773. | |  | c.  ​42.557. | |  | d.  ​16.047 and 45.722. | |  |  |  |

* **Question 30**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The producer of a certain bottling equipment claims that the variance of all their filled bottles is .027 or less. A sample of 30 bottles showed a standard deviation of .2 ounces. The *p*-value for the test is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | c.  between .025 to .05. | | Answers: | a.  .025. | |  | b.  .05. | |  | c.  between .025 to .05. | |  | d.  between .05 to .10. | |  |  |  |

* **Question 31**

0 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | A sample of 61 observations yielded a sample standard deviation of 6. If we want to test *H* 0:  *σ* 2 = 40, the test statistic is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | d.  9. | | Answers: | a.  9.15. | |  | b.  54. | |  | c.  54.90. | |  | d.  9. | |  |  |  |

* **Question 32**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | ​Consider the following hypothesis problem.     |  |  | | --- | --- | | *n* = 14 | *H*0: *σ*2 < 410 | | *s* = 20 | *H*a: *σ*2 > 410 |   ​  At the 5% level of significance, the null hypothesis |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | b.  ​should not be rejected​. | | Answers: | a.  should not be tested. | |  | b.  ​should not be rejected​. | |  | c.  ​should be revised. | |  | d.  should be rejected​. | |  |  |  |

* **Question 33**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The manager of the service department of a local car dealership has noted that the service times of a sample of 15 new automobiles has a standard deviation of 4 minutes. A 95% confidence interval estimate for the variance of service times for all their new automobiles is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | a.  8.576 to 39.794. | | Answers: | a.  8.576 to 39.794. | |  | b.  2.144 to 9.948. | |  | c.  2.93 to 6.31. | |  | d.  9.46 to 34.09. | |  |  |  |

* **Question 34**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The bottler of a certain soft drink claims their equipment to be accurate and that the variance of all filled bottles is .05 or less. The null hypothesis in a test to confirm the claim would be written as |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | c.  *H*0: *σ*2 ≤ .05. | | Answers: | a.  *H*0: *σ*2 ≥ .05. | |  | b.  *H*0: *σ*2 > .05. | |  | c.  *H*0: *σ*2 ≤ .05. | |  | d.  *H*0: *σ*2 < .05. | |  |  |  |

* **Question 35**

0.5 out of 0.5 points

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
|  | The contents of a sample of 26 cans of apple juice showed a standard deviation of .06 ounces. We are interested in testing whether the variance of the population is significantly more than .003. The test statistic is |  |  |  |
| |  |  | | --- | --- | | Selected Answer: | c.  30. | | Answers: | a.  500. | |  | b.  31.2. | |  | c.  30. | |  | d.  1.2. | |  |  |  |

Tuesday, March 10, 2020 3:36:37 PM PDT