

Examrace

Statistics MCQs – Hypothesis testing for Two populations Part 1

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1. Two samples of sizes 25 and 35 are independently drawn from two normal populations, where the unknown variances are assumed to be equal. The number of degrees of freedom for the equal-variances t-test statistic is:

- a. 58
- b. 60
- c. 62
- d. 57
- e. 68

Answer: A

2. Two samples of sizes 27 and 35 are independently drawn from two normal populations, where the unknown variances are assumed to be equal. The number of degrees of freedom for the equal-variances t-test statistic is:

- a. 58
- b. 60
- c. 62
- d. 57
- e. 68

Answer: B

3. Two samples of sizes 25 and 39 are independently drawn from two normal populations, where the unknown variances are assumed to be equal. The number of degrees of freedom for the equal-variances t-test statistic is:

- a. 58
- b. 60
- c. 62
- d. 57

e. 68

Answer: C

4. Two samples of sizes 24 and 35 are independently drawn from two normal populations, where the unknown variances are assumed to be equal. The number of degrees of freedom for the equal-variances t-test statistic is:

a. 58

b. 60

c. 62

d. 57

e. 68

Answer: D

5. Two samples of sizes 25 and 45 are independently drawn from two normal populations, where the unknown variances are assumed to be equal. The number of degrees of freedom for the equal-variances t-test statistic is:

a. 58

b. 60

c. 62

d. 57

e. 68

Answer: E

6. When the necessary conditions are met, a two-tail test is conducted to test the difference between two population means. The statistical software in use only provides one tail p-values as part of its output. Given a one-tail p-value of 0.036, what would a two-tail p-value for the same test be?

a. 0.018

b. 0.009

*c. 0.072

d. 0.964

e. 0.360

7. Which of the following statements is correct?

- a. independent samples are those for which the selection process for one sample is not related to the selection process for the other sample
- b. comparing the means from two independent samples requires comparing the value of the calculated test statistic with the p-value in order to decide whether the null hypothesis should be rejected or not
- c. an example of dependent samples occurs when subjects are randomly assigned to the experimental and control groups of an experiment
- d. a typical example of independent samples occurs with before and after measurements for the same individuals or test units
- e. a special hypothesis test, based on the t-distribution, can be applied to test the null hypothesis that the population variances for two independent samples are equal

Answer: A

8. Which of the following statements is correct?

- a. the pooled-variances t-test is used whenever the population standard deviations can be assumed to be equal, regardless of the sample size
- b. the unequal-variances t-test is used whenever the population standard deviations are unknown and cannot assumed to be equal
- c. the z-test can be used as a close approximation to the unequal-variances t-test when the population standard deviation are not assumed to be equal but sample sizes are large (typically greater than 30)
- d. all of the above statements are true
- e. none of the above statements are true

Answer: D

9. Assuming that samples are drawn from normal distributions, which of the following statement is false?

- a. The pooled-variances t-test is used whenever the population standard deviations are assumed to be equal
- b. The unequal-variances t-test is used whenever the population standard deviations are unknown and cannot be assumed to be equal
- c. The z-test can be used as a close approximation to the unequal-variances t-test when the population standard deviations are not assumed to be equal, but samples are large (typically greater than 30)

d. The null hypothesis in the F-test for comparing two population variances states that the sample variances are equal

e. The null hypothesis for a hypothesis test comparing two population means states that the population variances are equal

Answer: D

10. Two independent samples from populations that are normally distributed produced the following statistics: for sample 1 the sample size was 50, the sample mean was 34.2 and the sample standard deviation was 12.6. For sample 2, the sample size was 42, the sample mean was 49.1 and the sample standard deviation was 19.4. Assume that population variances are equal. Given a significance level of 5%, at what approximate value of t should you reject the null hypothesis that states that the two population means are equal, in favour of the two sided alternative?

a. ± 1.987

b. ± 1.990

c. ± 1.994

d. ± 2.021

e. ± 2.009

Answer: A

11. Two independent samples from populations that are normally distributed produced the following statistics: for sample 1 the sample size was 50, the sample mean was 34.2 and the sample standard deviation was 12.6. For sample 2, the sample size was 32, the sample mean was 49.1 and the sample standard deviation was 19.4. Assume that population variances are equal. Given a significance level of 5%, at what approximate value of t should you reject the null hypothesis that states that the two population means are equal, in favour of the two sided alternative?

a. ± 1.987

b. ± 1.990

c. ± 1.994

d. ± 2.021

e. ± 2.009

Answer: B

12. Two independent samples from populations that are normally distributed produced the following statistics: for sample 1 the sample size was 40, the sample mean was 34.2 and the

sample standard deviation was 12.6. For sample 2, the sample size was 32, the sample mean was 49.1 and the sample standard deviation was 19.4. Assume that population variances are equal. Given a significance level of 5%, at what approximate value of t should you reject the null hypothesis that states that the two population means are equal, in favour of the two sided alternative?

- a. ± 1.987
- b. ± 1.990
- c. ± 1.994
- d. ± 2.021
- e. ± 2.009

Answer: C

13. Two independent samples from populations that are normally distributed produced the following statistics: for sample 1 the sample size was 19, the sample mean was 34.2 and the sample standard deviation was 12.6. For sample 2, the sample size was 23, the sample mean was 49.1 and the sample standard deviation was 19.4. Assume that population variances are equal. Given a significance level of 5%, at what approximate value of t should you reject the null hypothesis that states that the two population means are equal, in favour of the two sided alternative?

- a. ± 1.987
- b. ± 1.990
- c. ± 1.994
- d. ± 2.021
- e. ± 2.009

Answer: D

14. Two independent samples from populations that are normally distributed produced the following statistics: for sample 1 the sample size was 25, the sample mean was 34.2 and the sample standard deviation was 12.6. For sample 2, the sample size was 27, the sample mean was 49.1 and the sample standard deviation was 19.4. Assume that population variances are equal. Given a significance level of 5%, at what approximate value of t should you reject the null hypothesis that states that the two population means are equal, in favour of the two sided alternative?

- a. ± 1.987
- b. ± 1.990

- c. ± 1.994
- d. ± 2.021
- e. ± 2.009

Answer: E

15. Which of the following statements regarding the F distribution is false?

- a. The F distribution is skewed to the right
- b. The F distribution has two sets of degrees of freedom
- c. The F distribution always has a mean of 1
- d. The F distribution is used to test the null hypothesis that the population variances are equal
- e. The F distribution is an all positive distribution

Answer: C

16. Which of the following statements correctly describes a difference between the F and t distributions?

- a. The F distribution is discrete, the t distribution is continuous
- b. The t distribution is valid only for positive numbers, the F for all real values
- c. The F distribution is symmetrical, the t distribution is skewed to the right
- d. The F distribution is valid only for positive numbers, the t for all real values
- e. The F distribution is skewed to the left, the t distribution is symmetrical

Answer: D

17. The owner of Bun & Run Hamburgers wishes to compare the sales per day at two different locations. The mean number of hamburgers sold for 10 randomly selected days at Northside was 83.55 with a population standard deviation of 10.50. For a randomly selected 12 days at Southside, the mean number of hamburgers sold was 73.80 with a population standard deviation of 14.25. We wish to test whether there is a difference in the mean number of hamburgers sold at the two locations using a 5% significance level. What is the value of the test statistic in this case?

- a. 1.84
- b. 0.24
- c. 2.65
- d. 1.71

e. 2.20

Answer: A

18. The owner of Bun & Run Hamburgers wishes to compare the sales per day at two different locations. The mean number of hamburgers sold for 10 randomly selected days at Northside was 75.06 with a population standard deviation of 10.50. For a randomly selected 12 days at Southside, the mean number of hamburgers sold was 73.80 with a population standard deviation of 14.25. We wish to test whether there is a difference in the mean number of hamburgers sold at the two locations using a 5% significance level. What is the value of the test statistic in this case?

a. 1.84

b. 0.24

c. 2.65

d. 1.71

e. 2.20

Answer: B

19. The owner of Bun & Run Hamburgers wishes to compare the sales per day at two different locations. The mean number of hamburgers sold for 10 randomly selected days at Northside was 83.55 with a population standard deviation of 10.50. For a randomly selected 12 days at Southside, the mean number of hamburgers sold was 69.54 with a population standard deviation of 14.25. We wish to test whether there is a difference in the mean number of hamburgers sold at the two locations using a 5% significance level. What is the value of the test statistic in this case?

a. 1.84

b. 0.24

c. 2.65

d. 1.71

e. 2.20

Answer: C

20. The owner of Bun & Run Hamburgers wishes to compare the sales per day at two different locations. The mean number of hamburgers sold for 10 randomly selected days at Northside was 83.55 with a population standard deviation of 12.45. For a randomly selected 12 days at Southside, the mean number of hamburgers sold was 73.80 with a population standard deviation of 14.25. We wish to test whether there is a difference in the mean number of

hamburgers sold at the two locations using a 5% significance level. What is the value of the test statistic in this case?

- a. 1.84
- b. 0.24
- c. 2.65
- d. 1.71
- e. 2.20

Answer: D

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