

Assignment 7 (Week 7)

Due on 2016-03-14, 19:29 IST

Submitted assignment

1) Choose the correct technique used for three populations, and 2 variables situations to test the equality of mean vectors of three different populations- **1 point**

- ☐ Hotelling's T-square
- ☐ ANOVA
- ☐ t-test
- ☒ None of these.

2) Which of the followings best describes the assumptions for MANOVA: **2 points**

- ☐ Population covariances are equal, errors are normally distributed, errors are identical, but not mutually independent
- ☒ Population covariances are equal, errors are normally distributed, errors are identically and independently distributed
- ☐ Population covariances are equal, cumulative errors are not normally distributed, errors are identically and independently distributed
- ☐ Population variances are equal, errors are not normally distributed, errors are identically and independently distributed.
- ☐ All are correct
- ☐ All are incorrect

3) Which of the followings is used to test the equality of population covariances **1 point**

- ☐ Modified Leven's test
- ☐ Tuckey's test
- ☐ MANOVA test
- ☒ Box M-test
- ☐ None of these.

4) In MANOVA with p number of response variables, and L number of populations, the correct number of comparisons (m) for estimating the simultaneous confidence intervals using Bonferroni approach: **1 point**

- ☒ $m = pL(L-1)/2$
- ☐ $m = (p-1)L/2$
- ☐ $m = Lp(p-1)/2$
- ☐ None of these.

5) Choose the correct expression for Wilk's Lambda, where $SSCP_E$, $SSCP_B$ are the sum of squares and cross product matrices for errors, and populations (treatments), respectively. **1 point**

- ☒
$$\frac{|SSCP_E|}{|SSCP_B + SSCP_E|}$$
- ☐
$$\left[\frac{|SSCP_E|}{|SSCP_B + SSCP_E|} \right]^T$$
- ☐
$$\left[\frac{|SSCP_B|}{|SSCP_B + SSCP_E|} \right]^T$$
- ☐ None of these

6) In MANOVA, while computing the Bonferroni simultaneous confidence interval between pair of means, which of the following distributions is used: **2 points**

- ☐ Chi-Square distribution with (N-L) degrees of freedom

- ☐ Chi-Square distribution with (N-L) degrees of freedom
- ☐ F-distribution with (N-L) degrees of freedom
- ☒ t-distribution with (N-L) degrees of freedom
- ☐ None of these

7) In MANOVA, for L number of populations involving P number of response variables, the correct degrees of freedom to test the hypothesis of equality of population mean vectors for is:

1 point

- ☐ P(L-2)
- ☐ L(P-2)
- ☐ L(P-1)
- ☒ None of these

8) Answer the following questions (8 to 10).

2 points

The recent growth of automobiles consumption in towns and small cities has led a major car manufacturing company to expand its service centres. In order to facilitate it, the company has made a survey on the service provided by three different types of service centres namely A, B and C so that a comparative analysis will help in creating better service centres to meet the recent demand. The two important response variables are delivery time (DT) and quality of services (QS) provided. A random sample of 30 feedbacks is collected for each of the three service centres. The sample statistics computed are given below. Take $\alpha = 0.05$.

$$\bar{X}_A = [10 \quad 50]^T, \bar{X}_B = [8 \quad 60]^T, \text{ and } \bar{X}_C = [5 \quad 50]^T.$$

$$S_A = \begin{bmatrix} 25 & -20 \\ -20 & 81 \end{bmatrix}, S_B = \begin{bmatrix} 36 & -30 \\ -30 & 64 \end{bmatrix}, \text{ and } S_C = \begin{bmatrix} 49 & -25 \\ -25 & 81 \end{bmatrix}$$

Based on the given data, compute the value of the test statistics T^2 .

- ☐ 12.01
- ☒ 22.49
- ☐ 15.85
- ☐ 18.46

☐ None of these.

9) Service centre A claims that on an average they serve their customers within 10 hours of DT with QS of 70. Justify the claim.

2 points

☐ Yes

☒ No

☐ Insufficient data.

10) Using data at Q8, choose the correct value of Wilk's lambda

2 points

☐ -3.86

☐ -7.22

☐ 3.86

☐ 7.22

☒ None of these.