DWIT

First assignment of Statistics II (Design)

Submission deadline : 10th July 2013

1. What do you mean by ANOVA? Write down applications of it.

2. What assumptions are required in the analysis of ANOVA?

3. Explain the model yij = µ +τi +eij , i= 1,2,3………m and j= 1,2,3,……n with the assumptions made on yij . Why the assumptions are required?

4.Write down the layout of two way ANOVA with it’s assumptions , effect model and ANOVA table

5. In one way ANOVA with model xij = µ + αi + e ij i= 1,2….a and j= 1,2…n show that

xij -x̅..)² = n - x̅..)² + xij  -x̅i.)²

6. In two way ANOVA with model xij = µ + αi + βj + e ij i= 1,2….m and j= 1,2…n show that

xij -x̅ ..)² = n - x̅..)² + m + xij -x̅i. - x̅.j +x̅..)²

7.State the mathematical model with the hypothesis to be tested in one way ANOVA. Write down the ANOVA table of it.

8 . In one way ANOVA with model xij = µ + αi + e ij i= 1,2….a and j= 1,2…n find E(MSR) and E(MSE).

9. In two way ANOVA with model xij = µ + αi + βj + e ij i= 1,2….m and j= 1,2…n find E(MSR) , E(MSC) and E(MSE).

10.In two way ANOVA with m observations per cell having model xijk =µ +αi +βj +ϒij +eijk i=1,2….p

J= 1,2…..q and k= 1,2… m show that TSS = SA2 + SB2 +SAB2 + SE2

11.What do you mean by one way ANOVA ?Write and explain the statistical model for it .Give the statistical analysis of it.

12. What do you mean by two way ANOVA? Write and explain statistical model for it. Give the statistical analysis of it with one observation per cell.

13.What do you mean by two way ANOVA with m observations per cell? Write and explain statistical model for it. Give the statistical analysis of it.

14.The varieties of A,B and C were shown in 4 plots each and the following yields kg per ha was obtained

A B C

84 74 22

40 50 52

62 52 45

75 15 35

Test the significance difference between the yields of the varieties.

15.In a feeding experiment on pigs three rations R1 , R2 and R3 the animals were placed in three different classes according to their initial body weight. The following table shows the gain in weight in kg in a certain period.

|  |  |  |  |
| --- | --- | --- | --- |
| Rations | Class I | Class II | Class III |
| R1 | 4 | 16 | 19 |
| R2 | 14 | 18 | 19 |
| R3 | 3 | 14 | 7 |

16.In a greenhouse experiment on wheat , four fertilizer treatments of the soil and four chemical treatments of the seed were used. Each combination was applied to two plots which were placed at random in the available space. The table gives below the yield in some suitable unit. Analyze the data.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fertilizer | Chemical treatment | | | |
| 1 | 2 | 3 | 4 |
| A | 22 , 21 | 21 , 20 | 20 , 19 | 18 , 17 |
| B | 12 , 14 | 14 , 13 | 13 , 14 | 13 , 14 |
| C | 14 , 12 | 14 , 16 | 12 , 13 | 13 , 14 |
| D | 13 , 14 | 14 , 13 | 14 , 13 | 12 , 15 |

17.The following table shows the life in hours of four batches of electric lamps:

Batches

1. 1600 1610 1650 1680 1700 1720 1800
2. 1580 1640 1650 1700 1750
3. 1460 1550 1600 1620 1640 1660 1740 1820
4. 1510 1520 1530 1570 1600 1680

Perform an analysis of variance of these data and show that a significant test does not reject their homogeneity.