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 $y_{ij} = \mu + \tau_i + e_{ij}$, i= 1,2,3……m and j= 1,2,3,……n with the assumptions made on y_{ij} . 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 $x_{ij} = \mu + \alpha_i + e_{ij}$ i= 1,2….a and j= 1,2…n show that

$\sum_{i=1}^{a} \sum_{j=1}^{n} (x_{ij} - \bar{x}..)^2 = n\sum_{i=1}^{a} (\bar{x_{i.}} - \bar{x}..)^2 + \sum_{i=1}^{a} \sum_{j=1}^{n} (x_{ij} - \bar{x}_{i.})^2$

6. In two way ANOVA with model $x_{ij} = \mu + \alpha_i + \beta_j + e_{ij}$ i= 1,2….m and j= 1,2…n show that

$\sum_{i=1}^{m} \sum_{j=1}^{n} (x_{ij} - \bar{x}..)^2 = n\sum_{i=1}^{m} (\bar{x_{i.}} - \bar{x}..)^2 + m\sum_{j=1}^{n} (\bar{x.}j - \bar{x}..)^2 + \sum_{i=1}^{m} \sum_{j=1}^{n} (x_{ij} - \bar{x}_{i.} - \bar{x}_{.j} + \bar{x}..)^2$

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 $x_{ij} = \mu + \alpha_i + e_{ij}$ i= 1,2….a and j= 1,2…n find E(MSR) and E(MSE).

9. In two way ANOVA with model $x_{ij} = \mu + \alpha_i + \beta_j + e_{ij}$ 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 $x_{ijk} = \mu + \alpha_i + \beta_j + \Upsilon_{ij} + e_{ijk}$ i=1,2….p

J= 1,2…..q and k= 1,2… m show that $TSS = S_A^2 + S_B^2 + S_{AB}^2 + S_E^2$

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 R_1 , R_2 and R_3 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
R_1	4	16	19
R_2	14	18	19
R_3	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.