STA 601 **Reg. No. ……**

CREDIT BASED VI SEMESTER B.Sc. DEGREE EXAMINATION APRIL 2013

STATISTICS -VII

DESIGNS OF EXPERIMENT

Time: 3 Hrs **Max. Marks: 80**

PART - A

Answer any TEN of the following: **10X2=20**

1. a) State the basic assumptions in the Analysis of Variance.

b) What are chance and assignable causes of variation?

c) Define (i) Experimental unit (ii) Replication

d) Explain Experimental error.

e) What is the basic purpose of analysis of variance?

f) Mention any two advantages of CRD.

g) Give the mathematical model of LSD.

h) What do you mean by factorial experiment?

i) What do you mean by missing plot technique?

j) Define a contrast.

k) Write down any two merits of factorial experiment.

l) What do you mean by Partial Confounding?

PART – B

Answer any Two of the following: **2x10=20**

2. Give the analysis of one-way classified data and write down the ANOVA table. (10)

3. Explain the technique of analysis of variance for a three-way classification, stating the breakdown of the total sum of squares and the hypothesis that are usually tested. Also write down the ANOVA table. (10)

4. Derive the expected values of error sum of squares and treatment sum of squares in two-way classification. (10)

Answer any TWO of the following: **2x10=20**

5. Describe the three basic principles of Design of Experiments. (10)

6. Obtain an estimate of a missing observation in a Latin square design and give the analysis of variance table. (10)

7. Derive an expression to measure the efficiency of LSD over RBD (with columns as blocks). (10)

Answer any TWO of the following: **2x10=20**

8. Describe the analysis of 2^2 factorial experiment carried out in RBD. Also write down the ANOVA table (10)

9. Define (i) Main effects (ii) Interaction effects in relation to 2^3 factorial experiments. Show that the main effects A, B, C and interaction effect AB are orthogonal contrasts to each other. (10)

10. a) Describe Yate's method of computing factorial effect totals in 2^3 factorial experiment.

b) What do you mean by confounding? Explain how the statistical analysis can be carried out in case of partial confounding in 2^3 factorial experiment (4+6)

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STA 601.1 **Reg. No. ……**

CREDIT BASED SIXTH SEMESTER B.Sc. DEGREE EXAMINATION APRIL 2014

STATISTICS

DESIGN OF EXPERIMENT

Time: 3 Hrs **Max. Marks: 80**

PART - A

Answer any TEN of the following: **2X10=20**

1. a) Mention the basic assumptions of ANOVA test.

b) Distinguish between assignable and chance causes of variation.

c) Define (i) treatment (ii) Experimental unit with an example for each.

d) Explain efficiency of a design.

e) Mention any two advantages of R.B.D.

f) Give the mathematical model of CRD.

g) What do you mean by a factorial experiment?

h) Obtain the least square estimate of Chi of one way classification.

i) Define a contrast.

j) Define the terms (i) Main effects (ii) interaction effects in a 2^2 factorial experiment.

k) What do you mean by missing plot technique?

l) State any two demerits of confounding.

PART – B

Answer any TWO of the following: **10x2=20**

2. Describe the fixed effect mathematical model for two way classification with one deservation per cell, stating clearly the assumption involved also obtain the estimates of the parameters in the model. **(10)**

3. Explain the technique of analysis of variance for one way classification and give the ANOVA table. **(10)**

4. Explain the partition of total sum of squares in three way classification stating the hypotheses to be tested degrees of freedom and ANOVA table. **(10)**

Answer any TWO of the following: **10x2=20**

5. Explain in detail the fundamental principles of design of experiments. **(10)**

6. Derive the equation to two missing observations in RBD and write the ANOVA table. **(10)**

7. Derive an expression to measure the efficiency of RBD compared with CRD. **(10)**

Answer any TWO of the following: **10x2=20**

8. Explain the analysis of 2^2 factorial experiment carried out in RBD and write down the ANOVA table. **(10)**

9. Obtain main effects and interaction effects of a 2^3 factorial experiment. **(10)**

10. a) Describe Yate's method of computing factorial effect total in 2^3 factorial experiment.

b) What do you mean by confounding? Explain how the statistical analysis can be carried out in case of complete confounding in 2^3 factorial experiment. **(5+5)**

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STA 601 **Reg. No. ……**

CREDIT BASED SIXTH SEMESTER B.Sc. DEGREE EXAMINATION APRIL 2015

STATISTICS

PAPER- VII DESIGN OF EXPERIMENTS

Time: 3 Hrs **Max. Marks: 80**

PART - A

Answer any TEN of the following: **10X2=20**

1. a) Mention any 2 objectives of experimental design.

b) Distinguish between chance and assignable causes of variation.

c) Define analysis of variance.

d) Define (i) Experimental unit (ii) Experimental error.

e) Write down the ANOVA of one way classification.

f) Give the layout of a LSD.

g) Write down the expression for one missing observation in RBD.

h) Mention any two advantages of CRD.

i) What do you mean by factorial experiment?

j) Define a contrast and orthogonal contrasts.

k) Mention any 2 advantages of factorial experiment.

l) Write the expression for main effects and interaction effects in 2^2 factorial experiments.

PART – B

Answer any TWO of the following: **10x2=20**

2. Explain the three basic principles of Design of Experiments. **(10)**

3. Stating the basic assumptions, model used and hypothesis being tested; derive the ANOVA table for two-way classified data. **(10)**

4. **a)** Break the total sum of squares and identify the distributions of various components in one-
way classification.
b) Find the expectation of treatment sum of squares in two-way classification. **(5+5)**

Answer any TWO of the following: **2x10=20**

5. Explain how do you estimate 2 missing values in an LSD and write down the ANOVA table. **(10)**

6. Explain LSD. Give the layout of the design with 4 treatments. Mention its advantages and disadvantages. **(10)**

7. Derive an expression to measure the efficiency of LSD over RBD with columns as blocks. **(10)**

Answer any TWO of the following: **2x10=20**

8. Describe the analysis of 2^2 factorial experiment carried out in RBD and write down the ANOVA table. **(10)**

9. a) Show that main effects and interaction effects are orthogonal contrasts of treatment means in 2^3 factorial experiments. **(6)**

b) Describe Yate's method of computing factorial effect totals in 2^3 factorial experiment. **(4)**

10. What do you mean by confounding? Explain how the statistical analysis can be carried out in case of partial confounding in 2^3 factorial experiment. **(10)**

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STA 601 Reg. No. .....

CREDIT BASED SIXTH SEMESTER B.Sc. DEGREE EXAMINATION APRIL 2016

STATISTICS

PAPER- VII DESIGN OF EXPERIMENTS

Time: 3 Hrs **Max. Marks: 80**

PART - A

Answer any TEN of the following: **10X2=20**

1. a) What is meant by 'Analysis of Variance' ?
   b) What is the difference between 'variability within classes' and 'variability between classes'.
   c) Define (i) Experiments (ii) Treatments.
   d) Explain experimental error.
   e) Write down the least square estimates of μ and α_i in the fixed effect model $yij = \mu + \alpha_i + e_{ij} \quad (i = 1.....k; j = 1.....n_i)$
   f) Mention any two advantages of CRD.
   g) State the mathematical model of RBD
   h) What is missing plot technique?
   i) Explain factors and levels in a factorial experiment.
   j) Define orthogonal contrasts.
   k) What do you mean by confounding?
   l) Write a note on efficiency of a Design.

PART – B

Answer any TWO of the following: **10x2=20**

2. Give complete analysis of two-way classified data. **(10)**
3. Derive the expected values of Error sum of squares and treatment sum of squares in one-way classification. **(10)**
4. Describe the technique of analysis of variance for a three-way classification stating the breakdown of the total sum of squares and the hypothesis that are usually tested. Also write down the ANOVA table. **(10)**

Answer any TWO of the following: **2x10=20**

5. a) Explain the three basic principles of experimentation. **(10)**
   b) Explain the procedure of testing for the equality of any two treatment effects in a LSD. **(6+4)**

6. Derive expressions for estimating two missing observations in RBD and write the ANOVA table. **(10)**

7. a) Derive an expression to measure the efficiency of RBD over CRD.

   b) Derive an expression of one observation missing in an LSD. **(5+5)**

Answer any TWO of the following: **2x10=20**

8. Explain the analysis of 2^2 experiment carried out in RBD and write down the ANOVA table. **(10)**

9. What do you mean by 2^3 factorial experiment? Derive the expressions for the main effects and interaction effects. Give the statistical analysis carried out in RBD and write down the ANOVA table. **(10)**

10. a) Describe Yate's method of computing factorial effect total in 2^3 factorial experiment.

    b) Explain the principle of confounding in design of experiment. How the statistical analysis can be carried out in case of partial confounding in 2^3 factorial experiment? **(4+6)**

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