

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)  
BSc DEGREE EXAMINATION MAY 2018  
(Sixth Semester)

Branch- STATISTICS

DESIGN OF EXPERIMENTS

Time : Three Hours

Maximum : 75 Marks

SECTION-A (20 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 2 = 20)

- 1 What is ANOVA?
- 2 Define the term experimental unit.
- 3 What is design of experiment?
- 4 What are the assumptions of analysis of variance?
- 5 Define Factorial Experiments
- 6 State any two advantages of using factorial experiments.
- 7 Define orthogonal contrast.
- 8 Define concomitant variable.
- 9 What is analysis of covariance?
- 10 Define incomplete block design.

SECTION - B (25 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 5 = 25)

- 11 a Define fixed effects and random effect model and bring out the difference between them.

OR

- b Give mathematical model, various sum of squares and ANOVA table for a one-way classification with t-treatment.

- 12 a What is RBD? Mention its merits over CRD.

OR

- b Explain the method of estimating one missing observation in LSD.

- 13 a Explain 2 factorial experiments by giving expressions for main effect and interaction effect.

OR

- b Obtain sum of squares due to various main effects and interactions in  $2^3$  factorial experiments.

- 14 a Explain the concepts total confounding and partial confounding with suitable example.

OR

- b Explain Orthogonality and confounding in factorial experiment.

- 15 a What do you understand by analysis of covariance? Give two examples.

OR

- b Write short note on split-plot design.

SECTION - C (30 Marks)

Answer any THREE Questions

ALL Questions Carry EQUAL Marks (3 x 10 = 30)

- 16 Explain the principles of Randomization, replication and local control.
- 17 Describe the complete analysis of RBD with r-blocks and t-treatments.
- 18 Discuss fully the analysis of  $3^2$  factorial experiments.
- 19 Explain Yate's method of finding various effect totals in a  $2^3$  partially confounded design with 3 replications. Also obtain various sum of squares and ANOVA table.
- 20 Discuss the analysis of covariance in RRD with one concomitant variable