

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Sixth Semester)

Branch – STATISTICS

DESIGN OF EXPERIMENTS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

1. Identify the measurement of the variable under study are termed as
 - (i) Replication
 - (ii) Precision
 - (iii) Yields
 - (iv) Treatments
2. Indicate the number of treatments is equal to the number of replication in
 - (i) Factorial design
 - (ii) Completely randomized design
 - (iii) Randomized block design
 - (iv) Latin square design
3. In a 2^2 factorial experiments the main effect due to A is defined by
 - (i) $A = \frac{1}{2}[(a+1)(b+1)]$
 - (ii) $A = \frac{1}{2}[(a-1)(b-1)]$
 - (iii) $A = \frac{1}{2}[(a-1)(b+1)]$
 - (iv) $A = \frac{1}{2}[(a+1)(b-1)]$
4. When a BIBD is said to be symmetrical if, number of blocks =
 - (i) number of factors
 - (ii) number of treatments
 - (iii) number of levels
 - (iv) number of degree of freedom
5. What is the total degrees of freedom for split – plot design?
 - (i) r-1
 - (ii) p-1
 - (iii) (r-1)(p-1)
 - (iv) rp-1

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

6. a Define ANOVA and state the assumptions of ANOVA.
OR
b State the mathematical model used in analysis of variance in a one-way classification. Explain the hypothesis to be used.
7. a Explain the merits of Completely Randomized Design.
OR
b Sketch the layout of RBD.
8. a With an example explain the factorial experiment.
OR
b Bring out the Yates method of computing sum of squares of 2^2 experiment.
9. a Write short notes on 3^k factorial experiment.
OR
b State the merits and limitations of confounding.
10. a Analyze and compare ANOVA and ANOCOVA.
OR
b Sketch the structure of split-plot design.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11. a Summarise the basic principles of design of experimentation.
OR
b Discuss the statistical analysis of a two way classified data with ANOVA table.
12. a Elucidate the procedure for the analysis of Latin Square Design.
OR
b Enumerate the method of estimating two missing values in RBD.
13. a Describe Yates method of calculation in factorial experiment.
OR
b Highlight a detailed note on the analysis of 2^3 factorial experiment conducted in randomized block.
14. a Summarise the analysis of 3^2 factorial experiment.
OR
b Distinguish between complete confounding and partial confounding.
15. a Discuss the procedure for ANOCOVA with one concomitant variable in CRD layout.
OR
b For a BIBD, Justify the following parametric relations.
(i) $vr = bk$
(ii) $b \geq v$
(iii) $\lambda (v-1) = r (k-1)$

Z-Z-Z

END