

Exam Date & Time: 26-Sep-2020 (02:00 PM - 05:30 PM)



PSG COLLEGE OF ARTS AND SCIENCE

Note: Writing 3hrs: Checking & Inserting Image : 30mins

MSc DEGREE EXAMINATION MAY 2020
(Fourth Semester)

Branch - STATISTICS

LINEAR MODELS AND DESIGN OF EXPERIMENTS [18STP19]

Marks: 75

Duration: 210 mins.

SECTION A

Answer all the questions.

- 1) An estimator is said to be the "Best" based on
 - (i) Consistency
 - (ii) Unbiasedness
 - (iii) Sufficiency
 - (iv) Minimum Variance(1)
- 2) Gauss-Markov theorem is based on
 - (i) Method of moments
 - (ii) MLE
 - (iii) Least Square Estimation
 - (iv) All the above(1)
- 3) The adoption of randomization over the entire experimental units on the design.
 - (i) CRD
 - (ii) RBD
 - (iii) LSD
 - (iv) Graeco-LSD(1)
- 4) Which one of the following is a square design?
 - (i) RBD
 - (ii) CRD
 - (iii) LSD
 - (iv) ANACOVA(1)
- 5) In 2^3 factorial design, the number of levels is
 - (i) 3
 - (ii) 2
 - (iii) 6
 - (iv) 8(1)
- 6) If the same treatment combination is confounded in all the blocks, it is known as
 - (i) Fractional confounding
 - (ii) Complete confounding
 - (iii) Partial confounding
 - (iv) Factorial confounding(1)

- 7) Factorial designs are used to test the effect of
 (i) main effects alone
 (ii) interaction effects alone
 (iii) both main and interactions
 (iv) none of the above (1)
- 8) The total number of treatment combinations in 2^3 factorial design is
 (i) 3
 (ii) 2
 (iii) 8
 (iv) 6 (1)
- 9) The process of unwanted treatment combinations mixed up with the block effects is called
 (i) orthogonal
 (ii) ANACOVA
 (iii) confounding
 (iv) RBD (1)
- 10) BIBD with parameters v, r, b, k is resolvable if
 (i) $b \geq u-r-1$
 (ii) $u \geq b+r-1$
 (iii) $u \leq b-r-1$
 (iv) $b \leq u+r-1$ (1)

SECTION B

Answer all the questions.

- 11) Explain the characteristics of the best linear unbiased estimator. (7)
- a)
 [OR] Write a detailed note on analytics of non - orthogonal data. (7)
 b)
- 12) Derive the various expected sum of squares in CRD. (7)
- a)
 [OR] Explain the missing plot techniques used for RBD. (7)
 b)
- 13) Construct Yate's table for the calculation of various sum of squares in 2^3 factorial design. (7)
- a)
 [OR] Explain and distinguish between complete and partial confounding. (7)
 b)
- 14) Distinguish between Inter and Intra block analysis. (7)

- a)
[OR] Write a detailed note on Yonden's square design. (7)
b)
- 15) Explain the design for bio-assays. (7)
- a)
[OR] Discuss the analysis of cross over design. (7)
b)

SECTION C

Answer 3 out of 5 questions.

- 16) State and prove Gauss-Markov theorem. (10)
- 17) Describe in detail the fundamental principles of design of experiments. (10)
- 18) Elucidate the analysis of 2^3 factorial experiment. (10)
- 19) Describe the analysis of BIBD. (10)
- 20) Analyze the direct and indirect line assays with examples. (10)

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