PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2022
(Fourth Semester)

Branch – STATISTICS

LINEAR MODELS AND DESIGN OF EXPERIMENTS

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (10 x 1 = 10)

1 The Gauss – Markov theorem proves
   (i)   MLE's are BLUE   (ii)   Moment estimators are BLUE
   (iii) LSE's are BLUE   (iv) All the above

2 The analysis of variance techniques is used for testing
   (i)   Several means   (ii)   Equality of means
   (iii) Several variances   (iv) All the above

3 The repetition of treatments under investigation is called
   (i)   Replication   (ii)   Randomization
   (iii) Local control   (iv) Blocking

4 The design in which randomization is restricted within each block is known as
   (i)   CRD   (ii)   RBD
   (iii) LSD   (iv) ANACOUA

5 In which of the following design, additional observations on each of the
  experimental units is taken?
   (i)   CRD   (ii)   LSD
   (iii) ANACOUA   (iv) RBD

6 In which one of the following design has more restriction on randomization?
   (i)   RBD   (ii)   LSD
   (iii) CRD   (iv) BIBD

7 BIBD is a design such that blocks are
   (i)   Incomplete   (ii)   Complete
   (iii) Partial   (iv) None of the above

8 In BIBD with parameters V, R, B, K
   (i)   Vr = bk   (ii)   Vb=rk
   (iii) Vk=br   (iv) Ub>rk

9 Which one of the following is the main effect?
   (i)   NP   (ii)   NK
   (iii) P   (iv) PK

10 Which one of the following is not the interaction effect?
   (i)   ABC   (ii)   BC
   (iii) AC   (iv) B

SECTION - B (35 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a What is estimability in linear parameter functions?

OR

b Write a detailed note on mixed plot technique.

12. a Write the statistical ~~detailed~~ analysis of CRD.

OR

b Discuss the analysis of one value missing observation in RBD.

13 a What is complete and partial confounding and give its importance.

OR

b Write a note on fractional factorials.

14 a Explain resolvable design and affine resolvable design.

OR

b State a resolvable BIBD with parameters V, b, r, k, λ and show that $b \geq V+r-1$.

15 a Explain response surface designs.

OR

b Write a note on weighing design.

SECTION - C (30 Marks)
Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Evaluate Gauss – Markov theorem.

17 Describe the analysis of ANACOVA in CRD.

18 Discuss the analysis of complete confounding in 2^3 factorial design.

19 Write a note on i) Yonden square design ii) Laltice design.

20 Describe the analysis of cross over design.

Z-Z-Z   END