**SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)**
**(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)**
**Chromepet, Chennai — 600 044.**
**M.Sc. - END SEMESTER EXAMINATIONS APRIL - 2022**
**SEMESTER - II**
**21PBSCT2006 - Design of Experiments**

**Total Duration : 3 Hrs.** **Total Marks : 60**

## Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Write a short note on
   (a) Fixed and Random effect model and (b) Uses of ANOVA in different fileds
2. Explain Tukey's test for non-additivity for two way layout with one observation per cell.
3. Explain how you would analyse a randomized block design
4. Discuss in detail fractional (half) factorial design with suitable illustration.
5. Describe Yates' method of computing factorial effect totals.
6. In a $3^2$ factorial design the following results are obtained in a single replication.

| | | A | | |
|---|---|---|---|---|
| Levels | | 0 | 1 | 2 |
| B | 0 | -3 | 2 | 1 |
| | 1 | -2 | -2 | 2 |
| | 2 | 1 | 1 | 1 |

7. Discus in detail the importance and the analysis of a SPLIT-Plot design.
8. Write note about Experimental Designs for Fitting Response Surfaces.

## Section B

### Part A

Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. State the mathematical model used in analysis of variance in two-way classification. Explain the hypotheses to be used. Discuss the advantages of this method over one-way classification, if any.
10. Explain the analysis of a Randomized Block Design.

**Contd...**

11. In $2^3$ factorial experiments, prove that the first order interactions AB, AC and BC and second order interaction ABC are mutually orthogonal contrasts of the treatment means. Also prove that AB = BA, ABC = BCA.

12. Discuss the second order response surface designs.

## Part B

Compulsory question $(1 \times 10 = 10$ Marks)

13. Explain in detail about two stage nested design with example.

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