

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, April 2022**First Degree Programme under CBCSS****Statistics****Core Course – IX****ST 1641 : DESIGN OF EXPERIMENTS AND VITAL STATISTICS****(2018 & 2019 Admission)**

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer all questions. Each question carries 1 mark.

1. Write the mathematical model for a two way Analysis of variance.
2. What are the assumptions of errors in experimental models?
3. Define a randomized design.
4. Which design do you prefer if the experimental units are homogeneous?
5. Define a LSD (Latin Square Design).
6. What effects are measured in factorial experiments?
7. Define Demography.
8. What is a cohort?
9. Define force of mortality.
10. What is crude Birth Rate?

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. Each question carries **2** marks.

11. What is a Randomized Block Design(RBD)?
12. Give the statistical model(model only) for a Completely Randomized Design CRD with one observation per cell.
13. What do you mean by local control?
14. Explain the advantages of LSD over RBD.
15. What is the importance of a Latin Square Design?
16. How can you calculate the sum of squares for analysis of variance of a LSD?
17. Write the expression for the efficiency of a Randomized Block Design over CRD.
18. What are factorial experiments?
19. What are the effects measured in factorial experiments?
20. What is the function of Sample Registration System of India?
21. Distinguish between curate (curtailed) expectation and complete expectation.
22. What are the methods of standardization of data?
23. Name three methods of constructing an abridged life table.
24. Define central mortality rate.
25. Distinguish between symmetrical and asymmetrical factorials.
26. Give the important measures of fertility.

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. Each question carries **4** marks.

27. Discuss the technique of Analysis of variance for one-way classification.
28. Explain the basic principles of experimentation.

29. Outline the analysis of a data with a single missing value of a $k \times k$ Latin square design.
30. What do you mean by mutually orthogonal Latin squares?
31. What is confounding?
32. Write the set of orthogonal contrasts for main effects and interactions in a 2^3 factorial experiment.
33. Specific Death Rate is better than Crude Death Rate. Justify.
34. Distinguish between stable and stationary population.
35. What is the significance of IMR in population studies?
36. Establish the relation between the life table functions q_x , the probability of dying within one year after attaining age x and m_x , the probability of dying a person whose exact age is not known but lies between x to $(x + 1)$ years (central mortality rate).
37. Distinguish between NRR and GRR.
38. In what way construction of a complete life table differ from that of an abridged life table?

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions. Each question carries **15** marks.

39. Characterize a Completely Randomized Design. What are the merits of CRD?
40. Describe the analysis of a LSD and sketch the ANOVA table.
41. Explain the Yates' method of analysis for a 2^2 factorial experiment.
42. Discuss the various uses of vital statistics for a country.
43. Given the age returns for the two ages $x = 9$ years and $x + 1 = 10$ years with the life table values as $l_9 = 75824$, $l_{10} = 75362$, $d_{10} = 418$, $T_{10} = 4953195$. Give the complete life table for the two ages 9 and 10 of the persons.
44. Explain the GFR and the information gathered by it. How the information is improved by Age Specific Fertility Rate and by Total Fertility Rate?

(2 × 15 = 30 Marks)