

**NEW**  
**Part-III 3-Tier**  
**2017**

**STATISTICS**

**PAPER—IV (A+B)**

**(General)**

*Full Marks : 45*

*Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

**Group—A**

**(ANOVA, Design of Experiments)**

Answer any *two* questions from Q. No. 1 to 4 : 2×9

1. Define the following terms in connection with design of experiments :

Treatment, Experimental unit, Experimental error.

*(Turn Over)*

2. Describe the layout and analysis of a CRD.
3. Discuss how the grouping of experimental units into homogeneous blocks is effective in reducing experimental error.
4. Define the terms main effects and interaction effects in relation to a  $2^3$  - experiment. Describe the analysis of a  $2^3$  - experiment conducted in  $r$  randomised blocks.

Answer any *one* question from Q. No. 5 and 6 :  $1 \times 7$

5. What is analysis of variance? Write down the analysis of variance table for one-way layout with  $K$ -treatments.
6. What are the assumption made in analysis of variance? Discuss the analysis of variance table for two-way layout with one observation per cell.

**Group—B**

(Sample Survey)

Answer any *two* questions from Q. No. 7 to 10.  $2 \times 7$

7. Discuss the basic principles of sample survey. What are the advantages of a sample survey over a complete census?
8. What do you mean by a simple random sample? Distinguish between SRSWR and SRSWOR.
9. What is stratified sampling? Discuss the advantages of stratified random sampling over simple random sampling.
10. What are random sampling numbers? How are they used in drawing simple random samples?

Answer any one question from Q. No. 11 and 12: 6

11. Obtain an expression for the standard error of an unbiased estimator of the population total in SRSWOR.
  
  12. Discuss the different sources of non-sampling error. What steps do you recommend to control non-sampling error?
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