

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [BATCH 2016-19]

B.A./B.Sc. FOURTH SEMESTER (January – June) 2018

Mid-Semester Examination, March 2018

Date : 17/03/2018

Time : 1 pm – 2 pm

STATISTICS (General)

Paper : IV

Full Marks : 25

[Use a separate Answer Book for each group]

Group – A

(Answer any three questions)

[3×5]

1. Define Probabilistic sampling, Simple random sampling and Stratified random sampling. [1+2+2]
2. What do you mean by biases in sample survey.
3. In case of SRSWR prove that $v(\bar{x}) = \frac{\sigma^2}{n}$ where $\bar{x}$, σ^2 and n are respectively sample mean, population variance and sample size.
4. In case of SRSWOR prove that $S.E(p) = \sqrt{\frac{N-n}{N-1} \cdot \frac{PQ}{n}}$ where p = sample proportion, P = Population proportion. $Q = 1 - P$, N = Population size and n = sample size.

Group – B

(Answer any two questions)

[2×5]

5. In one-way ANOVA, show that $E(MSB) \geq \sigma^2$, where MSB is mean 'between Sum of squares' & σ^2 is the error variance. [The model assumptions must be mentioned]. [10]
6. An experimenter wished to study the effect of 4 fertilizers on the yield on a crop. He divided the field into 24 plots and assigned each fertilizer at random to 6 plots. Part of his calculations are shown below :

Source	df	SS	MS	F	F _{5%}
Fertilizers	—	2940	—	—	3.10
Within group	—	—	—	—	
Total	—	6212			

- a) Complete the above table by filling in the values marked by '—'. [5]
- b) Test at 5% level to see whether the fertilizers differ significantly. [5]

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