

Bachelor of Rural Studies (BRS) (Honours) Examination, 2016

Semester – III

Paper – 18

(Basic Statistics for Rural Studies-II)

Time: 3 Hours

Full Marks: 40

Questions are of value as indicated in the margin.

1. **Answer any four questions.**

4×2=8

- a) Define sample space of a random experiment.
- b) If $P(A) = \frac{1}{4}$, $P(A/B) = \frac{3}{8}$, $P(B) = \frac{1}{3}$, Find $P(A^c \cap B)$ and $P(A \cap B^c)$.
- c) Define random variable.
- d) Comment on Skewers and Kurtosis of Normal distribution.
- e) What is the difference between sample and Sampling?
- f) What is level of significance in context of testing of hypothesis?

2. **Answer any eight questions.**

8×4=24

- a) Write down classical definition of probability and state its limitations.
- b) An urn contains 3 white balls and 4 black balls. Another urn contains 2 white and 3 black balls. One ball has been selected from the first urn and was transferred into second urn. Then a ball was drawn from the second urn. Find the probability that it is white.
- c) State important properties of Normal distribution.
- d) What do you mean by procedural biases in sample survey. Explain them.
- e) What is simple random sampling? State the difference between SRSWR and SRSWOR.
- f) State the difference between statistic and parameter.
- g) Define type I and Type II error with respect to testing of hypothesis. Explain the relation between them.
- h) A coin is tossed 5 times to test whether it is unbiased or not. $H_0 : p = \frac{1}{2}$ is rejected if more than 4 tosses result in head. Find Type I error.
- i) Write down the expression of $E(\bar{x})$ in case of SRSWR and SRSWOR. Hence comment in which situations two schemes are equivalent.

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- j) A speaks truth in 70% cases and B speaks lie in 20% cases. Find the probability that they will contradict each other in describing the same incident.
- k) If $x_1, x_2, \dots, x_n$ are sample observations from a population $N(\theta, 1)$ then prove that $\frac{1}{n} \sum_{i=1}^n x_i^2$ is an unbiased estimator of $(\theta^2 + 1)$
- l) Write short notes on **any one** of the following topics:
- i) One tail test and Two tail test.
 - ii) Systematic Sampling.
 - iii) Mutually exclusive events..
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