B.Sc. Semester-V Examination, 2022-23

ECONOMICS [Honours]

Course ID : 51611   **Course Code : SH/ECO/501/C-11**

Course Title : Statistical Methods for Economics-II

Time : 2 Hours   Full Marks : 40

The figures in the right-hand margin indicate marks.

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

1. Answer any **five** of the following questions:

$2 \times 5 = 10$

a) What is a *Random Experiment*?

b) What do you mean by *Equally Likely Events*?

c) State the Axioms in *Axiomatic Definition of Probability*.

d) What is meant by *Conditional Probability*?

e) Distinguish between *Statistic and Parameter*.

f) What is meant by *Standard Error*?

g) Distinguish between *Point Estimation & Interval Estimation*.

h) Comment on the accuracy (Correct or Incorrect) of the following results:

   i) For a Normal Distribution, Mean = 50, Median = 52, Mode = 90.

   ii) Any Measure of Skewness for Normal Distribution is +5.

2. Answer any **four** of the following questions:

$5 \times 4 = 20$

a) Define *Mutually Exclusive Events*. If A and B are two events in a random experiment which are not mutually exclusive, then show that

$$P(A+B) = P(A) + P(B) - P(AB)$$

$2 + 3 = 5$

b) A class has 12 boys and 4 girls. Suppose 3 students are selected at random from the class. Find the probability that (i) all are boys; (ii) all are girls.

c) Define *Probability Density Function(p.d.f.)* of a random variable. Verify whether the following function is a *Probability Density Function (p.d.f.)*:

$$f(x) = 2x, \qquad 0 \le x \le 1$$
$$= 4 - 2x, \quad 1 \le x \le 2$$
$$= 0, \qquad \text{otherwise.}$$

$2 + 3 = 5$

d) Explain the concept of *Stratified Sampling* mentioning the purposes, merits and demerits of such method.

e) Give the definition of *Standard Normal Variable*. Write down the *p.d.f.* of *Standard Normal Distribution* and state the important properties. 1+4=5

f) What is a *Statistical Hypothesis*? Mention the steps involved in *Testing of Hypotheses*.

2+3=5

3. Answer any **one** of the following questions:

10×1=10

a) Derive *Mean* and *Variance* of *Binomial Distribution*.

b) Distinguish between *Sampling Error* and *Non-sampling Error (or Bias)*. Discuss the different types of *Biases* that arise in statistical surveys.

3+7=10

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