QP – 175

19

I Semester B.Sc. Examination, March/April 2022
(CBCS) (2017 – 18 and Onwards) (Repeaters)
STATISTICS (Paper – I)
Basic Statistics – I

Time : 3 Hours Max. Marks : 70

Instructions : 1) *Answer* ***any ten*** *sub-divisions from Section – **A** and **five** questions from Section – **B**.*
2) *Scientific calculators are* ***allowed***.

SECTION – A

1. Answer **any ten** sub-divisions from the following. **(10×2=20)**
   a) Distinguish between classification and tabulation of data.
   b) Define median. Write its merits.
   c) Distinguish between absolute and relative measures of dispersion.
   d) What is skewness ? Distinguish between positive and negative skewness.
   e) Define mean deviation about mean and its coefficient value.
   f) Define correlation. What are the types of correlation ?
   g) Infer (i) $r_{xy} > 0$ (ii) $r_{xy} < 0$ through scatter diagram.
   h) Write down the expression for regression coefficient.
   i) Define coefficient of determination. Mention its use.
   j) Establish the relation between multiple and partial correlation coefficient.
   k) State the classical and statistical definition of probability.
   l) What are independent events ? Give two examples.

SECTION – B

Answer **any five** questions. **(5×10=50)**

2. a) What are primary and secondary data ? Give examples.
   b) Distinguish between :
      i) Nominal and ordinal data.
      ii) Variable and attribute.
      iii) Quantitative and qualitative classification. **(4+6)**

P.T.O.

3. a) State and prove any two properties of arithmetic mean.

   b) For any two positive values show that $G^2 = AH$
   where A = Arithmetic mean
   H = Harmonic mean. **(6+4)**

4. a) What are central and raw moments ? Write down the relationship between first four raw moments and central moments.

   b) Write the expression for coefficient of skewness and coefficient of kurtosis in terms of moments. **(6+4)**

5. a) Define kurtosis. State the condition for a distribution to be (a) Lepto kurtic (b) Meso kurtic (c) Platy kurtic.

   b) Show that $\beta_2 \geq \beta_1$, where β_1 and β_2 are moment coefficient of skewness and kurtosis respectively. **(5+5)**

6. a) Prove that coefficient of correlation is independent of origin and scale.

   b) With usual notations prove that $r_{xy} = \sqrt{b_{xy}\ b_{yx}}$. **(5+5)**

7. a) For trivariate data, obtain an expression for regression equation of X_1 on X_2 and X_3.

   b) Derive an expression for variance of residue. **(5+5)**

8. a) Define the terms :
   i) Deterministic experiment
   ii) Random experiment
   iii) Sample space
   iv) Event
   v) Probability of an event.

   b) With usual notations prove that $P(A \cup B) = P(A) + P(\overline{A}B)$. **(5+5)**

9. a) If A and B are independent events then prove that
   i) $\overline{A}$ and $\overline{B}$ are independent
   ii) $\overline{A}$ and B are independent.

   b) State and prove Baye's theorem. **(5+5)**
