QP – 237

13

I Semester B.Sc. Examination, April/May 2021
(CBCS) (F+R) (2017 – 18 and Onwards)
STATISTICS – I
Basic Statistics – I

Time : 3 Hours Max. Marks : 70

Instructions : *i) Answer **ten** sub-divisions from Section – **A** and **five** questions from Section – **B**.*
*ii) Scientific calculators are **permitted**.*

SECTION – A **(20 Marks)**

1. Answer **any ten** sub-divisions from the following. **(10×2=20)**
   a) What is secondary data ? Mention its sources.
   b) Distinguish between qualitative and quantitative classification.
   c) How do you obtain frequency curve from histogram ?
   d) Define mode and mention a demerit of it.
   e) Define quartile deviation and its relative measure.
   f) Define positive correlation and give example.
   g) Write down an expression for Karl Pearson's correlation coefficient and its limits.
   h) Give an expression for regression coefficient and regression equation.
   i) Define median and mode.
   j) Define partial correlation and mention the limits of partial correlation coefficient.
   k) State axiomatic definition of probability.
   l) Prove that $P(A\bar{B}) = P(A) - P(AB)$.

SECTION – B **(50 Marks)**

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

2. a) Explain nominal, ordinal and ratio data.
   b) Define attribute and variable with examples. **(6+4)**

3. a) State any two properties of arithmetic mean and prove one of them.
   b) Define geometric mean and obtain expression for combined geometric mean. **(5+5)**

P.T.O.

4. a) Define variance. Obtain an expression for combined variance.

   b) What are raw moments and central moments ? Write down the relationship between first four raw moments and central moments. **(5+5)**

5. a) Explain types of skewness with graph.

   b) What do you mean by Kurtosis ? Prove that $\beta_2 \geq 1$. **(5+5)**

6. a) Define correlation. Show that the limits of Karl Pearson's correlation coefficients are –1 and +1.

   b) What do you mean by least square method ? By this method derive an expression for regression coefficient. **(5+5)**

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

   b) Define residual. Show that its mean is zero. **(7+3)**

8. a) Define the terms : random experiment, sample space, event and complementary event.

   b) With usual notations prove that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. **(4+6)**

9. a) Define pairwise and mutual independent of events. Obtain the expression for number of conditions for mutual independent of n events.

   b) Prove that if $B \subset \bigcup_{i=1}^{n} A_i$, then $P(A_i \mid B) = \dfrac{P(A_i)\,P(B \mid A_i)}{\sum_{i=1}^{n} P(A_i)\,P(B \mid A_i)}$ **(5+5)**
