12127

Reg. No. | | | | | | | | | |

I Semester B.Sc. Degree Examination, August - 2021

STATISTICS - I

Basic Statistics - I

(CBCS Scheme Freshers 2020 - 21 & Onwards)

Paper - I

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates :

1) Answer any **Five** sub - divisions from Section A, **Five** sub - divisions from Section B and any **Five** questions from Section C.
2) Scientific calculators are permitted.

SECTION - A

I. Answer any **Five** sub - divisions from the following. **(5×2=10)**

1) a) Distinguish between variable and an attribute with an example.

b) What is classification? Mention the types of classification?

c) Define Median and Mode.

d) Define standard deviation and Co-efficient of Variation (C.V).

e) Define Karl - Pearson's coefficient of correlation and mention its limits.

f) Define Regression coefficients.

g) If $b_{xy} > 1$, then prove that $b_{yx} < 1$.

h) State classical definition of probability.

SECTION - B

II. Answer any **Five** sub - divisions from the following. **(5×3=15)**

2) a) Mention the requisites of a good statistical table.

b) Define Geometric mean and Harmonic mean. Mention their merits.

c) Define Quartile Deviation (Q.D) and Mean Deviation (M.D). Mention their relative measures.

d) Interpret various types of correlation using scatter diagram.

e) Examine the effect of change of origin and scale on correlation co - efficient.

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f) Define:
   i) Sample space.
   ii) Mutually exclusive events.
   iii) Equally likely events.

g) For two Mutually Exclusive Events A & B, find $P(A)$ if $P(B)=2P(A)$ and $(A\cup B)=S$.

h) With usual notations, prove that
   i) $P(A)+P(A')=1$.
   ii) $0\le P(A)\le 1$.

SECTION - C

III. Answer any **Five** questions from the following. **(5×9=45)**

3) a) What is primary data? Explain methods of collecting it. **(6+3)**
   b) Explain the construction of Histogram.

4) a) State the properties of Arithmetic Mean(AM) and prove any one of them. **(5+4)**
   b) Obtain the expression for combined geometric mean (GM).

5) a) Derive the expression for combined standard deviation of two series with n_1 and n_2 observations respectively. **(5+4)**
   b) Define raw moments and central moments. Write the moment co - efficient of skewness and kurtosis.

6) a) What is Skewness? Explain types of skewness with neat sketches. **(4+5)**
   b) Prove that $\beta_2 \ge 1$ where β_2 is moment coefficient of kurtosis.

7) a) Define an expression for Spearman's Rank correlation coefficient. **(5+4)**
   b) Obtain the expression for an acute angle 'θ' between two regression lines.

8) a) State and prove addition theorem of probability for two events. **(5+4)**
   b) If A and B are any two events in S and C is an assumed event then prove that
   $$P\left(\frac{AB}{C}\right)+P\left(\frac{AB'}{C}\right)=P\left(\frac{A}{C}\right).$$

9) a) Show that 2^k-k-1 conditions must be satisfied for k events to be independent. **(4+5)**
   b) State and prove theorem of total probability and hence deduce Baye's Theorem.