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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.

[P.T.O.]



- 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) $0 \leq P(A) \leq 1$.

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 $\beta_2 \geq 1$ 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.
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