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SEAT No. :

P5135

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[Total No. of Pages : 2

First Year B.Sc. (Computer Science)

STATISTICS

CSST-121 : METHODS OF APPLIED STATISTICS

(2019 Pattern) (Semester -II) (Paper-I)

Time :2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of calculator and statistical tables is allowed.*
- 4) *Symbols and abbreviations have their usual meaning.*

Q1) Choose the most appropriate alternative for each of the following: **[1 each]**

- i) The diagram which visualizes the correlation between two variables is.
 - a) Scatter diagram
 - b) Histogram
 - c) Bar diagram
 - d) Pie diagram
- ii) The number of normal equations required to fit the curve $Y=ab^X$ are
 - a) Four
 - b) Two
 - c) One
 - d) Three
- iii) Partial correlation coefficient $r_{12.3}$ is the simple correlation between
 - a) X_1 and X_2
 - b) X_1 and X_2 when linear effect of X_3 is eliminated from each of them.
 - c) X_1 and X_3
 - d) X_1 and X_3 when linear effect of X_2 is eliminated from each of them.
- iv) In time series the data are arranged in
 - a) Chronological order
 - b) Geographical order
 - c) Alphabetical order
 - d) Numerical order

Q2) Attempt any five of the following;

[2 each]

- a) Define bivariate data with one example.
- b) State the types of correlation giving one illustration each.
- c) Define Karl Pearson's coefficient of correlation.
- d) Explain the term regression.

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- e) If $b_{XY}=0.4$, $b_{YX}=1.6$, then find $r(X,Y)$.
- f) Define coefficient of determination. And state its interpretation.
- g) Define multiple correlation coefficient for a trivariate data.
- h) State the additive and multiplicative models of time series.

Q3) Attempt any two of the following:

[4 each]

- a) Six entries at a song competition were rated by two judges X and Y as follows.

Ranks by X	5	6	4	3	2	1
Ranks by Y	6	2	1	3	4	5

Compute Spearman's rank correlation coefficient between X and Y.

- b) For a trivariate data: $r_{12}=0.6$, $r_{13}=0.4$, if $R_{1,23}=1$, find the value of r_{23} .
- c) What is time series? Explain 'Trend' as a component of time series.

Q4) Attempt any Two of the following

[4 each]

- a) In the regression analysis the equation of two lines of regression are $2X+3Y=8$ and $X+2Y=5$, find mean values of X and Y.
also, define the following terms: Covariance, regression coefficient of Y on X.
- b) Explain the concept of multiple regression, Also, state the equation of multiple regression plane of X_1 and X_2 and X_3 .
- c) Describe the stepwise procedure of fitting the curve of the type $Y=a+bX+cX^2$ to the bivariate data using the method of least squares.

Q5) Attempt any one of the following:

[5each]

- a) Describe the stepwise procedure of fitting a line of regression of Y on X to the bivariate data using method of least squares.
- b) Fit a straight line trend by the method of least squares to the following data:

Year	2015	2016	2017	2018	2019
Production (in tonnes)	14	11	13	15	16

