

Total No. of Questions : 5]

SEAT No. :

PA-1008

[Total No. of Pages : 2

[5902]-27

F.Y. 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) Karl Pearson's coefficient of correlation lies between
 - a) 0 and 1
 - b) -1 and 1
 - c) -1 and 0
 - d) -3 and 3

- ii) The number of normal equations required to fit the curve $Y = a + bX + cX^2$ are _____
 - a) Four
 - b) Two
 - c) One
 - d) Three

- iii) In a trivariate data on (X_1, X_2, X_3) , Partial regression coefficient $b_{13.2}$ indicates.
 - a) X_1 is dependent variable and X_3 is independent variable.
 - b) X_2 is dependent variable and X_3 is independent variable.
 - c) X_1 is dependent variable and X_3 is also dependent variable.
 - d) X_3 is dependent variable and X_3 is independent variable.

- iv) In time series, the component having period of oscillation less than one year is
 - a) Trend
 - b) Cyclical variations
 - c) Seasonal variations
 - d) Random variations

P.T.O.

Q2) Attempt any Five of the following: [2 each]

- a) Define positive correlation. Give one illustration.
- b) For a certain bivariate data the least square lines of regression are $3x - y = 5$ and $4x - 3y = 0$. Obtain means of X and Y.
- c) Define coefficient of determination and state its interpretation.
- d) State the types of correlation for the following.
 - i) Weight and blood pressure of individuals.
 - ii) Supply and price of vegetables
- e) Define partial correlation coefficient.
- f) State two situations where multiple regression analysis is used.
- g) State the components of time series.
- h) Draw scatter diagram when X and Y have
 - i) high positive correlation
 - ii) perfect negative correlation

Q3) Attempt any TWO of the following: [4 each]

- a) Explain the concept of multiple correlation in case of trivariate data. Also, state the expression for multiple correlation coefficient $R_{1.23}$.
- b) Five entries at a musical competition were rated by two judges X and Y as follows:

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

Compute Spearman's rank correlation between X and Y.

- c) Describe the stepwise procedure of fitting a line of regression of Y on X to the bivariate data by using method of least squares.

Q4) Attempt any TWO of the following: [4 each]

- a) Explain the terms with one illustration:
 - i) Bivariate data
 - ii) Correlation
- b) Define regression coefficients and state its any two properties.
- c) What is time series? Explain Seasonal variation as a component of time series.

Q5) Attempt any ONE of the following: [5 each]

- a) Describe the moving average method used for the estimation of trend.
- b) If $\bar{X}_1 = \bar{X}_2 = \bar{X}_3 = 0$, $\sigma_1 = \sigma_2 = \sigma_3 = 1$, $r_{12} = r_{13} = r_{23} = \rho$ then find the equation of regression plane of X_1 on X_2 and X_3 .

