



A Charutar Vidya Mandal's Institution
V.P. & R.P.T.P. SCIENCE COLLEGE (AUTONOMOUS)
(Grant-in-Aid)
Affiliated to Sardar Patel University
VALLABH VIDYANAGAR-388120



Bachelor of Science (Semester II) Internal Examination - 2025
US02MISTA01 – Descriptive Statistics for Bivariate Data

Date: 5th March 2025, Wednesday

Time: 12.45 to 1:45 PM

Total marks: 20

Note: Q.2 and 3, each question is of having 7 marks

- Q.1 Multiple Choice Questions (6 × 1)
- (1) An investigator reports that the arithmetic mean of two regression coefficients of a regression line is 0.7 and the correlation coefficient is 0.75. Are the results
(a) Valid (b) Invalid (c) Inconclusive (d) None of these
- (2) Spearman's rank correlation coefficient is minimum when ranking is
(a) Same (b) Opposite (c) Random (d) None of these
- (3) The best fitted trend line is one for which sum of residuals or errors is
(a) Positive (b) Zero (c) Maximum (d) Minimum
- (4) Which of the following indicate negative correlation?
(a) No. of motor vehicles and no. of accidents in the city (b) Rainfall and production of cars
(c) Price and sale of the commodity (d) Expenditure on advertisement and sale
- (5) In a linear regression, the least squares line is $\hat{Y} = 3.75 - 1.25X$, and the coefficient of determination is 0.81, then the coefficient of correlation must be
(a) 0.90 (b) -0.90 (c) 1.25 (d) -3.75
- (6) If two variables are independent of each other the correlation coefficient between them must be _____
(a) 0 (b) 1 (c) -1 (d) Any

- Q.2 From the following data, fit an equation of the form $Y = aX^b$ to the data given below. Estimate the Facebook users for 2019. Also find average monthly increase in the users.

Number of Facebook users in India from 2011 to 2018 (In Millions)

Year	2011	2012	2013	2014	2015	2016	2017	2018
Facebook Users	135.60	165.57	194.11	219.94	242.53	261.83	277.95	291.50

OR

- Q.2 A researcher wants to measure the strength of the relationship between student's ranks in mathematics and statistics subjects. Which method do you use? Name and write in brief about it. How will you calculate it? Derive the formula for calculating the same.
- Q.3 Two regression lines intersect at which points? Obtain an angle between two regression lines. Interpret the cases when $r = 0, \pm 1$.

OR

- Q.3 Do as directed:
(i) Why there are two regression lines? Write down the properties of regression coefficients. Prove any one of them.
(ii) Prove that correlation coefficient is independent of change of origin and scale.

