

**POST GRADUATE DIPLOMA IN
APPLIED STATISTICS (PGDAST)**

Term-End Examination

June, 2026

MST-002 : DESCRIPTIVE STATISTICS

Time : 3 Hours

Maximum Marks : 50

Note : (i) *Question No. 1 is compulsory.*

(ii) *Attempt any **four** questions from the remaining question nos. 2 to 7.*

(iii) *Use of scientific calculator (non-programmable) is allowed.*

(iv) *Use of Formulae and Statistical Tables Booklet for PGDAST programme is allowed.*

(v) *Symbols have their usual meanings.*

1. State whether the following statements are True or False. Give reasons in support of your answers :

$$5 \times 2 = 10$$

- (a) If each observation of the data set 8, 9, 10, 15, 6, 1, 8, 5, 7 is multiplied by 2, then the arithmetic mean of the data set, so obtained will also be multiplied by 2.
- (b) The coefficient β_2 measures the skewness of a data set and it is zero for symmetrical distribution.
- (c) If the correlation coefficient between two variables is zero, then the two variables are independent.
- (d) The regression equation of x on y is used to estimate the values of y for given values of x .
- (e) The range of coefficient of colligation is 0 to 1.

2. (a) The numbers 4.5, 6.6, 3.4 and 6.5 have frequencies $x + 4$, $x + 5$, x and $x - 2$. If the arithmetic mean is 11, find the value of x and write the entire series. 4
- (b) The following is the distribution of age (in years) of 500 workers :

Age Group	No. of Workers
20–25	20
25–30	40
30–35	60
35–40	120
40–45	100
45–50	80
50–55	50
55–60	50

Find the (i) Median (ii) Quartile deviation and coefficient of Quartile deviation. 6

3. (a) By using the method of least squares, find the estimated values of a and b , where X and Y have a relationship of

the type $Y = ab^X$ from the following table (use log base 10) : 6

X	Y
1	2
3	6
7	18
9	24
15	30

- (b) Using suitable measure of descriptive statistics, find the strength and direction of linear relationship between X and Y from the following available information : 4

X	Y
5	100
10	80
15	60
20	40
25	20

4. For the data given in the following table :

X_1	X_2	X_3
1	3	4
3	5	5
4	3	6
7	7	8
9	8	9
10	11	12
12	13	14

find the regression equation of X_1 on X_2 and

X_3 . Also, estimate the value of X_1 for

$X_2 = 10$ and $X_3 = 8$. 10

5. (a) Define partial correlation coefficient. If

$$r_{13} = -0.30, \quad r_{23} = -0.27 \quad \text{and} \quad r_{12} = 0.58,$$

then calculate the correlation coefficient

of X_1 on X_2 and X_3 . 4

- (b) Suppose X and Y are two variables with the following values :

X	Y
50	40
60	30
80	70
90	80
100	120

Using X and Y, two new variables W and Z are obtained by dividing each observation of X and Y by 10 and 5, respectively. Find the correlation coefficient between old variables X and Y; and between the new variables W and Z using the given data. Also, interpret the results. 6

6. (a) From the following data, prepare 2×2 table and using Yule's coefficient discuss whether there is any association between literacy and unemployment.

Illiterate Unemployed 150 persons

Literate Employed 15 persons

Illiterate Employed 100 persons

Total number of persons 400 persons

Also, obtain the coefficient of colligation. 7

(b) Give *two* data sets having same mean and mode but different variance. 3

7. For the given data, study the association between the temperament of fathers and daughters by computing the coefficient of contingency and interpret the results : 10

Temperament of Fathers	Temperament of Daughters		
	Choleric	Melancholic	Sanguine
Choleric	80	57	58
Melancholic	61	59	45
Sanguine	54	46	47

(Use $C_{\max} = 0.816$)

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