No. of Printed Pages : 7

MST–002

POST GRADUATE DIPLOMA IN APPLIED STATISTICS (PGDAST)

Term-End Examination

June, 2025

MST-002 : DESCRIPTIVE STATISTICS

Time : 3 Hours *Maximum Marks : 50*

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

(ii) Attempt any ***four*** *questions out of the remaining Question Nos.* ***2*** *to* ***7****.*

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

(iv) Use of Formulae and Statistical Tables Booklet for PGDAST 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 : 5×2=10

   (a) If the arithmetic mean of the numbers 8, 3, 2 and 6 with their corresponding frequencies $(Y-1)$, Y, $(Y+1)$ and $(Y+2)$ is 4, then the value of Y is 2.5.

   (b) If $n=10$, $\bar{x}=4$ and $\sum_{i=1}^{n} x_i^2 = 250$, then coefficient of variation is 75 percent.

   (c) If X and Y are two variables such that corr (X, Y) = 0, then X and Y are independent.

   (d) If N = 1000, (A) = 600, (AB) = 480 and (B) = 500, then $(\alpha\beta)$ is 300.

   (e) Two distributions, with same mean, standard deviation and coefficient of skewness, must have the same peakedness.

2. (a) The mean and standard deviation of 20 items are found to be 10 and 4,

respectively. At the time of checking, it was observed that one item 7 was incorrect. Find the mean and standard deviation if it is replaced by 15. 3

(b) The runs scored by two batsmen in 10 matches are as follows : 7

Batsman A	Batsman B
25	100
15	0
37	5
43	75
100	50
80	35
106	6
40	125
42	0
16	3

Who is a better run scorer ? Also, find which of the two batsmen is more consistent in scoring.

3. (a) Fit a power curve $Y = a^{X^b}$ to the following data (Use log base *e*) : 5

X	Y
5	8
1	10
9	11
4	7
7	6

(b) Given the following frequencies of the positive classes : 5

(A) = 975, (AB) = 455, (ABC) = 125, (B) = 1187, (AC) = 290, N = 12000, (C) = 585 and (BC) = 250.

Find the frequencies of the following classes :

(ABγ), (AβC), (αβγ), (αC), (αBγ)

4. From the given data in the following table find out : 10

(i) Least square regression equation of X_1 on X_2 and X_3.

(ii) Estimate the value of X_1 for $X_2 = 45$ and $X_3 = 8$:

X_1	X_2	X_3
1	3	4
3	5	5
4	6	6
7	7	9
10	9	11

5. (a) Define multiple and partial correlations. From the following data, obtain the correlation coefficient between (i) x_1 and x_3 after removing the linear effect of x_2 on them, and (ii) x_1 and joint effect of x_2 and x_3 : 5

$$r_{12} = 0.69,\ r_{13} = 0.22 \text{ and } r_{23} = 0.23$$

(b) Find the correlation coefficient between advertisement expenditure and profit for the following data : 5

Advertisement expenditure	Profit
35	46
40	45
44	50
47	54
35	52
43	65

6. (a) Compute the correlation ratio for the following bivariate data : 6

y \ x	47	52	57	62	67
57	4	4	2	0	0
62	4	8	8	1	0
67	0	7	12	1	4
72	0	3	1	8	5
77	0	0	3	5	6

(b) From the following data, calculate Yule's coefficient of association between weight of the children and the economic condition, and interpret it : 4

	Poor Children	**Rich Children**
Below Normal Weight	83	25
Above Normal Weight	7	57

7. (a) For the following data on the variable X : 5

11, 9, 14, 10, 14, 9, 6, 13, 12, 6, 7, 13, 20, 4, 10, 8, 15, 12, 4

find A, B and C such that :

(i) $\frac{1}{19}\sum_{i=1}^{19}(x_i - A) = 0$

(ii) $\frac{1}{19}\sum_{i=1}^{19}|x_i - B|$ is minimum

(iii) $\frac{1}{19}\sum_{i=1}^{19}(x_i - C)^2$ is least

(b) Marks of 6 students of a class in Paper I and Paper II of Statistics are given as follows : 5

Paper I	Paper II
60	62
65	35
76	45
85	85
90	62
106	91

Find :

(i) both the regression coefficients

(ii) both the regression lines.

× × × × ×