| | **MST-002** |

POST GRADUATE DIPLOMA IN
APPLIED STATISTICS (PGDAST)
Term-End Examination
June, 2017

02262

MST-002 : DESCRIPTIVE STATISTICS

Time : 3 hours   *Maximum Marks : 50*

Note :

   (i)   *Attempt **all** questions. Questions no. 2 to 5 have internal choices.*

   (ii)   *Use of scientific calculator is allowed.*

   (iii)   *Use of Formulae and Statistical Tables Booklet is allowed.*

   (iv)   *Symbols have their usual meaning.*

1. State whether the following statements are *True* or *False*. Give reason in support of your answer. *5×2=10*

   (a)   For a given set of data; if AM = 4 and HM = 8, then GM will be 16.

   (b)   Standard deviation of the data : 10, 10, 10, 10, 10 is 0·1.

   (c)   In a population of size N, we define three attributes A, B, C such that (ABC) = 60, (α B C) = 75, (AB γ) = 250, (AB) = 10. The data is consistent.

   (d)   Suppose x is measured in cm and y is measured in kg. If we want to fit y = a + bx, then the unit of b will be cm/kg.

   (e)   If r(x, y) = 0, then x and y have no relationship.

2. (a) For the data 5, 8, 12, 15, 20, 30,

what should be the value of A so that

$$\sum_{i=1}^{6} (x_i - A)^2$$ is minimum, as compared to

any other value ? *2*

(b) A cyclist travels the first 5 km at a speed of 20 km/h and the next 3 km at a speed of 10 km/h. Find the average speed of the cyclist. *2*

(c) The scores of two batsmen in 5 innings are as follows : *6*

Batsman A	10	30	50	70	90
Batsman B	10	20	30	40	50

Which one is more consistent ?

OR

Comment on the symmetry and peakness of the following data : *10*

CI	f
0 – 10	10
10 – 20	40
20 – 30	20
30 – 40	0
40 – 50	10
50 – 60	40
60 – 70	16
70 – 80	14

3. It is suggested that the relation between y and x is of the type y = ab^x. Obtain the best fit equation of the curve, for the following data : *10*

x	2	4	6	8	10
y	1	3	6	12	24

OR

The ages of husbands and wives at the time of marriage are noted and the following data is obtained :

Age of Husband	Age of Wife					
	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	Total
15 – 25	6	3	–	–	–	9
25 – 35	3	16	10	–	–	29
35 – 45	–	10	15	7	–	32
45 – 55	–	–	7	10	4	21
55 – 60	–	–	–	4	5	9
Total	9	29	32	21	9	100

Find the degree of linear relationship between the age of husband and wife. *10*

4. A research scholar collected some data for his purpose in hand and obtained many results. Due to heavy rain, all the collected data and the results obtained were destroyed except a piece of paper where two lines of regressions were written as :

$$6x + 15y = 27, \quad 6x + 3y = 15$$

On the basis of this information, *4+2+2+2*

(i) State which line is x on y and which is y on x.

(ii) Obtain the mean of x and y variables.

(iii) Find r(x, y).

(iv) Find the estimated value of y for x = 2.

OR

Explain the difference between multiple correlation and partial correlation. Interpret the meaning of $r_{1.23}$ and $r_{12.3}$. Obtain (i) the correlation coefficient between x_2 and x_3 after removing the linear effect of x_1 and (ii) the correlation coefficient between x_1 and joint effect of x_2 and x_3 on x_1, for the following data : *2+2+3+3*

x_1	20	15	25	26	28	40	38
x_2	12	13	16	15	23	15	28
x_3	13	15	12	16	14	18	14

5. In an observation of 100 cases it was found that the number of unmarried students was 40, the number of failed students in the examination was 55 and the number of married students who failed in the examination was 30. From the information given above find 2+2+2+2+2

   (i) the number of married students,

   (ii) the number of students who passed the examination,

   (iii) the number of married students who passed,

   (iv) the number of unmarried students who passed,

   (v) the number of unmarried students who failed.

OR

A company is interested in determining the strength of association between the communicating time of their employees and the level of stress-related problems observed on job. A study of 116 assembly line workers reveals the following data : 10

Communicating Time	Stress			
	High	Moderate	Low	Total
Under 20 minutes	9	5	18	32
20 – 50 minutes	17	8	28	53
Over 50 minutes	18	6	7	31
Total	44	19	53	116

Assume that $C_{max} = 0.816$.