

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

**Term-End Examination**

**June, 2024**

**MST-002 : DESCRIPTIVE STATISTICS**

*Time : 3 Hours*

*Maximum Marks : 50*

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**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.*

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1. State whether the following statements are True or False. Give reasons in support of your answers : 2 each

- (a) A cyclist pedals from his house to his college at a speed of 10 km. p.h. and back from the college to his house at 15 km. p.h. Thus, average speed will be 12 km. p.h.

- (b) If 10 is the mean of 7 observations and 5 is the mean of a set of 3 observations, then the mean of combined set is given by 9.5.
- (c) If the regression coefficients of X on Y and Y on X are  $-0.4$  and  $-0.9$  respectively, then correlation coefficient between X and Y is 0.6.
- (d) If mean = median = mode, the value of skewness is 100.
- (e) The following data on the attributes A and B, having  $N = 1000$ ,  $(A) = 800$ ,  $(B) = 400$ ,  $(AB) = 80$  is consistent, where the symbols having their usual meaning.
2. (a) Calculate Yule's coefficient of association for the following data : 3  
 $(A) = 600$ ;  $(B) = 800$ ;  $(AB) = 600$ ;  $N = 1000$
- (b) Give that  $X = 4Y + 5$  and  $Y = KX + 4$  are the lines of regression of X on Y and Y on X respectively. Show that  $0 < 4K < 1$ . If  $K = \frac{1}{16}$ , find the mean of two variables and correlation coefficient between them. 7

3. (a) In an examination, 600 candidates appeared, boys outnumbered girls by 16% of all candidates. Number of passed exceed the number of failed candidates by 310. Boys failing in the examination numbered 88. Find the Yule's coefficient of association between male sex and success in examination. 5
- (b) The following table consists of data of 1000 college students who were graded according to their IQ level and the economic condition of their parents :

	IQ Level		
Economic Condition	High	Low	Total
Rich	460	140	600
Poor	240	160	400
Total	700	300	1000

Use the coefficient of contingency to determine the amount of association between economic condition and IQ level. 5

4. (a) For the following data :

Marks of Group	No. of Students
0—10	4
10—20	8
20—30	11
30—40	5
40—50	12
50—60	6
60—70	3

find the lower and upper quartiles. Also find the median coefficient of quartile deviation from the given data. 6

- (b) Write down the definition of co-relation and regression. Also give the reason, why there are two lines of regression. 4
5. (a) Find the coefficient of correlation from the following data : 5

$x$	$y$
67	95
69	90
71	87
75	80
85	79
93	75
87	80
73	85

- (b) For the data given in part (a), assign the ranks to the values of variables X and Y and compute rank correlation coefficient. 5
6. (a) Fit a straight line to the following data : 4

$x$	$y$
1	5
2	7
3	9
4	10
5	11

- (b) If  $r_{12} = 0.60$ ,  $r_{13} = 0.50$  and  $r_{23} = 0.45$ .  
Then calculate  $r_{12.3}$  and  $r_{23.1}$ . 2
- (c) Describe the method of least squares for fitting a parabola. 4
7. (a) From the following data, find the coefficient of variation : 6

Marks	No. of Students
0-10	5
10-20	10
20-30	20
30-40	40
40-50	30
50-60	20
60-70	10
70-80	4

- (b) Define the consistency of data. Also, state and prove the conditions of consistency for three attributes A, B and C. 4