

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

Term-End Examination

December, 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 (non-programmable) calculator 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 : $2 \times 5 = 10$
- (a) If the slope of the regression line is positive, then the correlation is also positive.

- (b) A researcher found the correlation between age of death and number of cigarettes smoked per day to be -0.95 . Based just on this information, the researcher conclude that smoking causes early death.
 - (c) The mean is the score at the 50th percentile for skewed distribution.
 - (d) If $(AB)=10$, $(\alpha B)=15$, $(A\beta)=20$ and $(\alpha\beta)=30$, then A and B are associated.
 - (e) Kurtosis measures the direction and magnitude of the lack of symmetry of a distribution.
2. (a) The first of two samples has 100 items with mean 15 and standard deviation 3. If the whole group has 250 items with mean 15.6 and standard deviation $\sqrt{13.44}$, find standard deviation of second group. 3
- (b) The first three moments of a distribution about the value 2 of the variable are : 1, 16 and -40 respectively. Show that the mean, variance and the values of μ_3 are respectively 3, 15 and -86 . 3

- (c) The mean and standard deviation of 200 items are found to be 60 and 20. If at the time of calculation, two items are wrongly taken as 3 and 67 instead of 13 and 17, find correct mean and correct standard deviation. 4
3. (a) Compute the coefficient of skewness and kurtosis based on the following information : 8

x	f
4.5	1
14.5	5
24.5	12
34.5	22
44.5	17
54.5	9
64.5	4
74.5	3
84.5	1
94.5	1

- (b) Describe the order of classes and class frequencies with a proper example. 2

4. (a) Define Spearman's Rank Correlation. The marks of ten students obtained in Statistics and Chemistry are given as follows :

Statistics	Chemistry
8	84
36	51
98	91
25	60
92	86
62	58
82	62
65	35
75	68
39	49

Find rank correlation.

- (b) The following data are given for marks in Statistics and Economics :

Mean marks of Statistics, $\bar{x} = 39.5$

Mean marks of Economics, $\bar{y} = 47.5$

S. D. of marks in Statistics, $\sigma_x = 10.8$

S. D. of marks in Economics = 16.8

Correlation coefficient = + 0.42

Find the two regression lines.

- (c) Differentiate the following with suitable example : 2+2

- (i) Positive and Negative correlation
- (ii) Multiple and Partial correlation

5. (a) Calculate Yule's coefficient of association for the following data : 3

$$A = 600; B = 800, (AB) = 600; N = 1000$$

- (b) Fit a straight line to the following data : 4

x	y
0	2
1	1
2	3
3	2
4	4
5	3
6	5

- (c) Define the Association of Attributes. Also describe the types of association. 3
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 : 6

Illiterate Unemployed : 250 persons

Literate Employed : 25 persons

Illiterate Employed : 180 persons

Total Number of persons : 500

- (b) Describe the method of finding of coefficient of contingency using Chi-square.

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7. (a) From the given data in the following table :

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

- (i) Find the 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 $X_3 = 8$.

- (b) Calculate the coefficient of concurrent deviation for the following data : 3

X	Y
368	122
384	121
385	124
360	125
347	122
384	126

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