

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

Term-End Examination

June, 2023

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 : 2 each
- (a) If each observation of data set :
10, 12, 14, 15, 16, 11, 13
is multiplied by 5, then the standard deviation of the data set so obtained will also be multiplied by 5.

- (b) If $r = 0.75$, then the variation in the dependent variable due to independent variable is 0.75.
- (c) If there are 3 attributes, then total number of class frequencies of all orders will be 27.
- (d) If regression coefficients b_{xy} and b_{yx} are 0.5 and -1.5 respectively, then correlation coefficient will be 0.866.
- (e) If a batsman A has average score 50 with S.D. 10 and batsman B has average score 30 with S.D. 3, then batsman B is more consistent.
2. (a) In a class, there were 150 students. Their results in quarterly, half yearly and annual examinations were as follows :
- 5
- 85 passed the quarterly exam
- 80 passed the half yearly exam
- 94 passed the annual exam
- 50 passed the quarterly and annual examinations
- 28 passed all three and 20 failed all three
- 25 passed the first two and failed in the annual exam,
- 43 failed the first two but passed the annual exam.
- Find how many students passed at least *two* exams.

- (b) A company is interested in determining the strength of association between the communicating time of their employees and the level of stress related problem observed on job. A study of assembly line workers reveals the following information :

Communication Time	Stress Level	
	High	Low
Under 50 min.	6	56
Over 50 min.	84	18

Determine the amount of association between communication time and stress level. 5

3. For a given set of bivariate data, the following results were obtained :

$$n = 100, \Sigma X = 5,000, \Sigma Y = 10,000,$$

$$\Sigma X^2 = 2,60,000, \Sigma Y^2 = 10,40,000,$$

$$\Sigma XY = 5,16,000$$

- (i) Find the predicted value of Y when X = 60.
 (ii) Find the predicted value of X when Y = 80.
 (iii) Calculate the coefficient of determination and interpret the result. 10

4. (a) For a certain distribution, the mean is 10, S.D. is 4, $\beta_1 = 1$ and $\beta_2 = 4$. Obtain the first four moments about 4. 6
- (b) Define partial correlation coefficient and give an examples. For the following data :
 $r_{12} = 0.9$, $r_{23} = 0.4$ and $r_{13} = 0.5$
 find $R_{2.13}$ and interpret. 4
5. (a) In a skewed distribution, the mode and mean are 32.1 and 35.4, respectively. Calculate the median. 2
- (b) Student's ages in a full time M. B. A. programme and a part time M. B. A. programme of a university are given as follows :

Full Time M. B. A.	Part Time M. B. A.
23	27
22	36
27	29
22	20
24	30
21	21
25	30
26	20
23	28
24	29

If homogeneity of the class is a positive factor in learning, use a measure of relative variability to suggest which of the two groups will have more consistent age. 8

6. Coefficient of correlation between X and Y for 20 items is 0.3. Mean of X is 15 and that of Y is 20 while standard deviations are 4 and 5, respectively. At the time of a calculation, one item 27 has wrongly been taken as 17 in case of X series and 35 instead of 30 in case of Y series. Find the correct coefficient of correlation. 10
7. (a) Given A and B are independent attributes. $N = 200$, $(A) = 100$, $(B) = 140$, find rest of the class frequencies. 3
- (b) Describe correlation ratio and method of least squares. 4
- (c) If two regression lines are :
- $$6x + 15y = 27$$
- $$6x + 3y = 15$$
- then find regression coefficients and coefficient of correlation. 3