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MST-002

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

Term-End Examination

June, 2019

MST-002 : DESCRIPTIVE STATISTICS

Time : 3 Hours

Maximum Marks : 50

Note : Question No. 1 is compulsory. Attempt any four questions out of the remaining Question Nos. 2 to 7. Use of scientific calculator (non-programmable) is allowed. Use of formulae and statistical tables booklet for PGDAST programme is allowed. Symbols have their usual meanings.

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

2×5=10

- (a) In a frequency curve of scores, the mode was found to be higher than the mean.

This shows that the distribution is negatively skewed.

- (b) If variance of X is 3 and $Y = 5X - 3$, then variance of Y is 12.
- (c) If $b_{xy} = -0.9$, $b_{yx} = -0.4$, then $r(x, y) = +0.6$.
- (d) If we have 15 attributes, then total number of classes of order 3 is 3660.
- (e) If $10X - Y + 5 = 0$ is line of regression of X on Y, then for $X = 3$, the estimated value 35 of Y is the best estimated value.
2. (a) Comment on shape (symmetry) and flatness of the data given below by calculating appropriate descriptive statistics measures : 8
- 3, 13, 2, 10, 7, 11, 18, 1, 11, 10, 5, 7, 9, 8, 20, 9, 12, 2, 17, 5.
- (b) Dimensions of a cuboid are 40 cm, 80 cm, 20 cm. Using a descriptive statistical tool, find the edge of a cube which enclose the same volume as that of the cuboid. 2

3. (a) X and Y are associated by the relation $Y = aX^b$. Estimate values of a and b to obtain best fit curve from the following information: 5

X	Y
6	9
2	11
10	12
5	8
8	7

- (b) Using suitable measure of descriptive statistics, find strength and direction of linear relationship between X and Y from the following available information: 5

X	Y
10	90
20	85
30	80
40	60
50	45

4. (a) On the basis of ranks given in the following table, to what extent the knowledge of the students in statistics and mathematics is related : 2

Rank in Statistics	Rank in Mathematics
1	2
2	4
3	1
4	5
5	3
6	8
7	7
8	6

- (b) From the data given below, study the association between temperament of brothers and sisters : 8

Temperament of Brothers	Temperament of Sisters			
	Quick	Good Natured	Sullen	Total
Quick	850	571	580	2001
Good Natured	618	593	455	1666
Sullen	540	456	457	1453
Total	2008	1620	1492	5120

5. From the table given below find out : 10

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

(ii) Estimated value of X_1 for $X_2 = 45$ and $X_3 = 8$.

X_1	X_2	X_3
1	3	4
2	4	5
3	5	6
4	6	7
5	7	8

6. (a) Among adult population of a certain town, 50% of the population is male, 60% are wage earners and 50% are 45 years of age or over. 10% of the males are not wage earners and 40% of the males are under 45. Can we infer anything about what percentage of the population of 45 years of age or over are wage earners? 5

(b) In an examination, at which 600 candidates appeared, boys outnumbered girls by 16% of all candidates. Number of passed candidates exceeded the number of failed candidates by 310. Boys failing in the examination numbered 88. Find the Yule's coefficient of association between sex and result in the examination. 5

7. (a) For the data given below : 4

- 4, 7, 20, 8, 35, 15, 21, 19, 13, 22, 25, 29,
25, 23, 8, 22, 18, 11, 33, 10

calculate :

(i) Average of squared deviations from its mean.

(ii) A value which divides the data into two equal halves.

(b) The line of regression of marks in Statistics (X) on marks of Economics (Y) for a class of 50 students is :

$$3Y - 5X + 180 = 0.$$

Mean marks in Economics is 44 and the variance of marks in Statistics is $\frac{9}{16}$ of the variance of marks in Economics. 6

Find :

- (i) mean marks in Statistics
- (ii) coefficient of correlation between the marks of two subjects.