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Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, March 2023

First Degree Programme under CBCSS

Statistics

Complementary Course for Mathematics

ST 1131.1 – DESCRIPTIVE STATISTICS AND BIVARIATE ANALYSIS

(2022 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark.

1. What is a questionnaire?
2. Define nominal scale with an example.
3. If the sum of N observations is 630 and their mean is 42, find the value of N.
4. Define harmonic mean.
5. Mean deviation is minimum when deviations are taken from ....
6. Define skewness.
7. What is scatter diagram?
8. What is the principle of least squares?
9. What is the relation between the correlation coefficient and the regression coefficients?
10. Interpret the value of 0 for the product moment correlation coefficient.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions. Each question carries **2** marks.

11. Distinguish between census and sampling.

12. Define systematic sampling.

13. What is classification and tabulation of data?

14. Show that A.M ≥ G.M. ≥ H. M for any data set.

15. In a moderately asymmetrical distribution median is 41.6, mode is 48.4. Find mean.

16. Show that standard deviation is not affected by change of origin.

17. If the coefficient of variation of a distribution is 50 and its variance is 400. What will be the value of arithmetic mean?

18. Write the normal equations required for fitting of a straight-line $y = ax + b$.

19. Write the relationship between first four central moments in terms of raw moments.

20. Define coefficient of determination.

21. The correlation coefficient between two variables X and Y is $r = 0.60$. If the means and standard deviations of X and Y are 10, 20, 1.50 and 2.00 respectively, find the regression equation of Y on X.

22. Distinguish between positive and negative correlation.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. Each question carries **4** marks.

23. Distinguish between sampling and non-sampling errors.

24. Explain simple random sampling with replacement and without replacement

25. Calculate the geometric mean for the following data.

Class :	1-3	4-6	7-9	10-12
Frequency :	8	16	15	3

26. Calculate mean deviation about mean of 8, 24, 12, 16, 10, 20.

27. The mean marks of 80 students of a class are 65. The mean marks of boys are 70 and that of girls is 62. Find the number of girls in the class.

28. Find the first, second and third moments about the origin for the set of numbers 1, 3, 5, 7.

29. Explain the least square method of fining of a parabola.

30. Calculate the rank correlation coefficient from the following data specifying the ranks of 7 students in two subjects.

Rank in 1st subject :	1	2	3	4	5	6	7
Rank in 2nd subject :	4	3	1	2	6	5	7

31. Show that correlation coefficient is independent of change of origin and scale.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. Each question carries **15** marks.

32. Calculate mean, median and mode for the following data.

Class :	0-10	10-20	20-30	30-40	40-50	50-60
Frequency :	5	15	40	32	20	8

33. Calculate Karl Pearson's coefficient of skewness for the following frequency distribution.

Class :	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104
Frequency :	8	15	18	25	14	9	6	5

34. Fit an equation of the form $y = ab^x$ to the following data.

x :	0	1	2	3	4	5	6
y :	32	47	65	92	132	190	275

Estimate y when $x = 8$.

35. The following are the data on the average height of the plants and weight of yield per plot recorded from 10 plots of rice crop.

Height (X) :	28	26	32	31	37	29	36	34	39	40
Yield (Y) :	75	74	82	81	90	80	88	85	92	95

Find :

(a) correlation coefficient between X and Y.

(b) the regression coefficients and hence write down the regression equations and

(c) probable value of the yield of a plot having an average plant of height of 98 cm.

(2 × 15 = 30 Marks)