Reg. No. : ....

Name : ....

First Semester B.Sc. Degree Examination, November 2018
First Degree Programme under CBCSS
Complementary Course for Mathematics
ST 1131.1 – DESCRIPTIVE STATISTICS
(2018 Admission)

Time : 3 Hours　　　　　　　　　　　　　　　　　　Max. Marks : 80

SECTION – A

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

1. Define census.

2. State the two methods of sampling.

3. Define arithmetic mean.

4. What is the empirical relationship between mean, median and mode ?

5. What is an inter quartile range ?

6. Express the 4th central moment in terms of raw moments.

7. What is the moment measure of kurtosis ?

8. Write the relationship between regression coefficient and correlation coefficient.

9. What is the use of a regression equation ?

10. What is correlation.　　　　　　　　　　　　　　**(10×1=10 Marks)**

SECTION – B

Answer **any 8** questions. **Each** question carries **2** marks.

11. Define simple random sampling with and without replacement.

12. Define stratified random sampling.

P.T.O.

13. How will you construct a frequency polygon ?

14. How do you distinguish a symmetrical distribution from a non-symmetrical distribution ?

15. Define coefficient of range.

16. Explain Karl Pearsons measure of skewness.

17. Distinguish between absolute and relative measure of dispersion.

18. The values of mode and median for a moderately skewed distribution are 64.2 and 68.6 respectively. Find the value of the mean.

19. Write the normal equation for fitting a curve of the form $y = ax^b$.

20. What do you mean by curve fitting ?

21. What is meant by perfect correlation ?

22. Distinguish coefficient of correlation from coefficient of variation. **(8×2=16 Marks)**

SECTION – C

Answer **any 6** questions. **Each** question carries **4** marks.

23. Distinguish between primary and secondary data.

24. Distinguish between probability and non-probability sampling.

25. Explain the different steps in the construction of frequency table for a given set of observations.

26. Calculate the range and semi-inter quartile range of wages :

Wages (Rs.) :	30 – 32	32 – 34	34 – 36	36 – 38	38 – 40	40 – 42	42 – 44
Labourers :	12	18	16	14	12	8	6

Also calculate the quartile coefficient of dispersion.

27. The arithmetic mean and standard deviation of a series of 20 items were calculated by a student as 20 cm and 3 cm respectively. But while calculating them an item 13 was misread as 30. Find the correct standard deviation.

28. Show that mean deviation about median is a minimum.

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

30. Explain the principle of least squares. Describe how an exponential curve of the form $y = ab^x$ can be fitted.

31. You are given the following data :

	X	Y
Arithmetic mean	36	85
Standard deviation	11	8

Correlation coefficient between X and Y is 0.66

a) Find the two regression equations and

b) Estimate the value of X, when Y = 75. **(6×4=24 Marks)**

SECTION – D

Answer **any 2** questions. **Each** question carries **15** marks.

32. The following data give the weekly wages of 100 workers in a factory :

Weekly wages : 20 – 24 25 – 29 30 – 34 35 – 39 40 – 44 45 – 49 50 – 54 55 – 59 60 – 64

No. of workers : 4 5 12 23 31 10 8 5 2

Draw less than ogive and hence find the value of median. Also verify your answer by median formula.

33. The table below gives the distribution by size (no. of works employed) of 40 different companies.

No. of workers : 1 – 50 51 – 100 101 – 150 151 – 200 201 – 250 251 – 300 301 – 350

No. of companies : 13 9 0 7 4 5 2

Calculate :

a) The total number of persons employed in these 40 companies.

b) The standard deviation.

c) Coefficient of variation.

34. Find Karl Pearsons coefficient of correlation from the following data :

Wages :	100	101	102	102	100	99	97	98	96	95
Cost of living :	98	99	99	97	95	92	95	94	90	91

35. Given the two equations for the regression lines

$8x - 10y + 66 = 0$

$40x - 18y - 214 = 0$

   i) Identify the regression lines of Y on X and X on Y.

   ii) Obtain the regression coefficients and the correlation coefficient.

   iii) Find the mean of X and the mean of Y.

   iv) Given the standard deviation of X = 4, find the standard deviation of Y.

(2×15=30)