

Reg. No. :

Name :

Fifth Semester B.Sc. Degree Examination, December 2022

First Degree Programme Under CBCSS

Statistics

Open Course

ST 1551.8 : ESSENTIAL STATISTICS FOR SOCIAL SCIENCES

(2018 Admission onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer all questions. Each question carries 1 mark.

1. What is the relation between first quartile and 25th percentile?
2. If the lower and upper limits of a class are 10 and 40 respectively, what is the midpoint of the class?
3. What is the point of intersection of two cumulative frequency curves?
4. Define sampling frame.
5. Write the relation between mean, median and mode for a symmetrical distribution?
6. Define mode.
7. What is the relation between correlation coefficient and regression coefficients of a bivariate data?
8. Give classical definition of probability.
9. What is meant by type I error of a test?
10. Find the number of runs in the sequence
ABBAAABAABBBAAAB.

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

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

11. What is meant by classification?
12. Define Gallop poll.
13. What is scatter diagram?
14. Distinguish between frequency and cumulative frequency.
15. Define coefficient of variation and what are its uses?
16. Give the formula for calculating percentiles of a continuous distribution.
17. Find the mean of the values 11, 12, 13, 14 and 15.
18. Name the different measures of dispersion.
19. Find the median of the series 3, 18, 7, 20, 11, 12, 9, 17 and 22.
20. How does variance is affected by the change of origin and scale?
21. Explain why there are two regression lines?
22. What is non parametric test?
23. Define null hypothesis *and* alternative hypothesis.
24. What is the relation between mean and variance of Poisson distribution?
25. Define a statistical hypothesis.
26. If $X \sim B\left(4, \frac{2}{3}\right)$, find $P[X = 2]$.

(8 × 2 = 16 Marks)

SECTION – C

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

27. What are the advantages of diagrammatic representation of data?
28. Give briefly the characteristics of a good questionnaire.

29. What are the main purpose of tabulation?
30. Explain histogram and construct it for the following:
 Income: 0-50 50-100 100-200 200-300 300-400
 No. of families: 60 80 70 30 10
31. In a moderately asymmetrical series, median is 41.6, mode is 48.4. Find mean.
32. Find the mean of the following:
 x : 7 12 16 22 25
 f : 4 5 8 3 2
33. What is the difference between absolute and relative measures of dispersion?
34. Given that the two regression equations are $8x - 10y + 65 = 0$, $40x - 18y - 214 = 0$. Identify the regression lines of y on x and x on y .
35. Calculate the median for the following data.
 Classes : 0-6 7-13 14-20 21-27 28-34 35-41
 Frequency : 8 17 28 15 9 3
36. Ten boys of the same age were given a special diet. The increase in their weights were as follows. Using the sign test examine whether there is reason to believe that the diet increases as weight of children. 6, 6, 1, 3, 3, 1, 3, -2, 4, -2.
37. Explain Wilcoxon sign test.
38. State the properties of normal distribution.

(6 × 4 = 24 Marks)

SECTION – D

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

39. Draw the ogives for the following distribution and find out the median
 Class : 0-20 20-40 40-60 60-80
 Frequency : 7 16 13 4
40. Calculate the mean, median and mode for the following data.
 Class: 0-10 10-20 20-30 30-40 40-50
 Frequency: 3 13 18 12 5

41. Prices of a particular commodity in five months at two regions are as follows:
- | | | | | | |
|----------------|----|----|----|----|----|
| Region A (Rs.) | 20 | 22 | 19 | 22 | 23 |
| Region B (Rs.) | 18 | 12 | 10 | 20 | 15 |

Compare the consistency of the prices in two regions.

42. 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
(cms)										
Yield (Y):	75	74	82	81	90	80	88	85	92	95
(kg)										

Find

- (a) correlation coefficient between X and Y.
 - (b) the regression coefficients
 - (c) regression equation of y on x and x on y
43. The following was obtained in an investigation about an effect of vaccination for small pox.

	Vaccinated	Not Vaccinated	Total
Attacked by small pox	3	12	15
Not attacked	8	5	13
Total	11	17	28

Examine whether vaccination is effective in preventing small pox.

44. Explain:
- (a) Kruskal – Wallis test
 - (b) Friedman two way analysis of variance
 - (c) Kolmogorov Smirnov test.

(2 × 15 = 30 Marks)