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N – 3972

Reg. No. :

Name :

First Semester B.Sc. Degree Examination, June 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Mathematics

ST 1131.1 : DESCRIPTIVE STATISTICS

(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

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

1. What do you mean by primary data?
2. Define central tendency.
3. Find the median of 2,9,7,3,6,8,5,10.
4. With the help of which graph can you locate a partition value graphically?
5. What do you mean by dispersion?
6. Why Quartile deviation is called the semi- inter quartile range?
7. What is the purpose of measuring skewness and kurtosis?

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8. When do you say a frequency distribution is symmetric?
9. Define curve fitting.
10. What is regression analysis?

(10 × 1 = 10 Marks)

SECTION – B

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

11. What precautions are to be taken before we use a secondary data?
12. Name the important scales of measurements of data.
13. Define systematic sampling method.
14. What is weighted arithmetic mean?
15. Define Geometric mean. For what type of data it is appropriate?
16. Show that the sum of the deviations of the observations from the mean is zero.
17. Define quartiles. What is their importance?
18. Calculate the geometric mean of 2,4,8
19. How do you compute the mean deviation about the mean in a discrete data?
20. What is the implication of positive and negative skewness?
21. For a moderately skewed distribution what is the relation between mean, median and mode?

22. How do you comment on the type of Kurtosis with the help of the moment coefficient β_2
23. To fit a parabola of the form $y = ax^2 + bx + c$, from a given data by the method of ordinary least squares, write the normal equations that are needed to estimate the parameters.
24. What are the underlying assumptions of Karl Pearson's coefficient of correlation?
25. When do you go for computing rank correlation coefficient?
26. Why there are two regression lines? When do they coincide?

(8 × 2 = 16 Marks)

SECTION – C

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

27. What are the steps in carrying out a Statistical survey?
28. What are the advantages of stratification in a data?
29. Calculate the percentile rank of the student who scored 87 in the data giving the marks of an examination: 59,82,67,85,75,71,77,68,91,87,83,61,95.
30. The average of 100 workers was found to be Rs.600. Later on it was discovered that the wages of two workers were misread as 350 and 450 instead of 300 and 500. Compute the correct mean of the data.
31. Write a comparison between absolute and relative measures of dispersion. What are the important absolute measures of dispersion?
32. Find the variance of the first n natural numbers.

33. What is the effect of the change in origin and scale on moments of a distribution?
34. For a distribution the mean is 10, standard deviation is 4, $\gamma_1 = +1$, $\beta_2 = 4$. Find the first four central moments (Moments about the mean).
35. Establish the Bowley's coefficient of skewness. What is its range of variation?
36. Can you ascertain the nature of skewness based $\beta_1 = \frac{\mu_3^2}{\mu_2^3}$. Else, how can you confirm it?
37. What are the properties of the regression coefficients?
38. Given the two regression lines of Y on X and that of X on Y as $Y=2X$ and $6X-Y=4$ respectively. Find (a) the correlation coefficient and (b) the means of X and Y.

(6 × 4 = 24 Marks)

SECTION – D

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

39. (a) Explain the advantages of diagrammatic representation of data. What are the important diagrammatic representation of statistical data?
- (b) Describe the construction of a pie-diagram. Construct a pie diagram for the following data giving the statistics of the IQ status of a group of students:

Type of IQ :	LIQ	Av.IQ	Good IQ	EGIQ
No.of students	20	15	10	5

40. (a) Write the merits and demerits of A.M.

(b) The following table gives that distribution of marks of 100 students. If the mode of the distribution is 46.7, assuming that 40-50 as the modal class, find the missing frequencies.

Marks	0- 10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequencies:	5	8	7	-	28	20	-	10

41. Calculate the (i) Quartile Deviation and (ii) Mean Deviation about the mean from the following data

Marks:	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No.of Students	6	5	8	15	7	6	3

42. Compute the Pearson's moment measures of skewness and Kurtosis for the following data and comment on the nature of the distribution based on your findings from the following data.

Wages	10-12	12-14	14-16	16-18	18-20	20-22	22-24
No of workers:	1	3	7	20	12	4	3

43. (a) Discuss the various types of correlation.

(b) For the following data fit a straight line of the form $y = a + bx$

Also estimate y when $x = 20$.

X	0	1	2	3	4
Y	0	1.8	3.3	4.5	6.3

44. (a) Discuss the Karl Pearson's coefficient of correlation and its relevance in literature.

(b) The scores for nine students in physics and math are as follows. Compute the Spearman's rank correlation coefficient and comment on your finding.

Physics: 35 23 47 17 10 43 9 6 28

Mathematics: 30 33 45 23 8 49 12 4 31

(2 × 15 = 30 Marks)
