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Registration number:

ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27

 B.Sc. Statistics - I SEMESTER

SEMESTER EXAMINATION: MARCH 2022

 **ST 121 - Descriptive Statistics**

 Time- 3 hrs Max Marks-100

This question paper contains five printed pages and four parts.

Scientific calculators are allowed.

**Section – A**

1. **Choose a Correct answer. 1x20=20**
2. In \_\_\_\_\_\_\_ sampling all the units of the population have equal chance of being included in the sample.
3. Systematic
4. Stratified
5. Simple Random
6. None of these.
7. \_\_\_\_\_\_\_\_\_ is a classification of units on the basis of locality, country, etc.
8. Temporal classification
9. Quantitative classification
10. Spatial classification
11. None of these.
12. In a frequency distribution, the class intervals at the extremities may not have one of the limits then it is called
13. Open-end class interval.
14. Exclusive type class interval
15. Inclusive type class interval
16. None of these.
17. \_\_\_\_\_\_\_\_ is a smooth graph with cumulative frequencies plotted against variate values.
18. Frequency Curve
19. Histogram
20. Ogives
21. None of these
22. In scatter diagram if the points cluster around a line with positive slope, the variables are
23. Negatively Correlated.
24. Positively Correlated.
25. Perfectly Correlated.
26. None of these.
27. The mean marks scored by 30 girls of a class is 44%. The mean marks of 50 boys is 42%. Then the combined mean of the whole class is
28. 42.75%
29. 43.75%
30. 44.75%
31. 46.75%
32. Production & Price of vegetables is an example for \_\_\_\_\_\_ correlation.
33. Negative
34. Positive
35. Perfect positive
36. Perfect negative.
37. In a bivariate data on x & y, Var(x)= 49, Var(y)= 9, Cov(x,y)= -17.5. Then the coefficient of correlation is
38. 0.835
39. -0.833
40. 0.936
41. -0.933
42. The regression coefficient gives the
43. Change occurring in x for unit change in y
44. Change occurring in y for unit change in x
45. Change occurring in x for twice the change in y
46. None of these
47. In a bivariate data, the regression coefficients are 8.3 and 0.01. Then the coefficient of correlation is
48. -0.2886
49. 0.2881
50. 0.3881
51. -0.3884
52. If the investigation is based on a part of the population, then it is called
53. Sample survey
54. Census survey
55. Pilot survey
56. None of these.
57. An example of Ordinal scale is
58. Blood Pressure level
59. Gender
60. Religion
61. Roll numbers of students
62. Skewness means
63. Symmetry
64. Lack of Symmetry
65. Positively Skewed
66. Negatively Skewed
67. If the value of kurtosis is equal to 3 then the distribution is
68. Platykurtic
69. Mesokurtic
70. Leptokurtic
71. None of these
72. Which of the following is known as positional average?
73. Mean
74. Median
75. Geometric Mean
76. Harmonic Mean
77. \_\_\_\_\_\_\_\_\_\_\_\_\_ is the least of all the root-mean-square deviations.
78. S.D
79. M.D
80. Q.D
81. Range
82. \_\_\_\_\_\_\_\_\_\_\_\_\_ is used for detecting outliers in the data.
83. Stem and Leaf display
84. Box-plot
85. Histogram
86. Q-Q plot
87. The square of the correlation coefficient is called
88. Gini’s Co-efficient
89. Coefficient of Variation
90. Coefficient of Determination
91. Coefficient of Mean deviation
92. The concept of regression theory was invented by
93. Prof. Karl Pearson
94. Prof. R. A. Fisher
95. Sir Francis Galton
96. Prof. Laplace
97. \_\_\_\_\_\_\_\_\_\_ Correlation deals with relation among three or more variables.
98. Positive correlation
99. Perfect correlation
100. Partial correlation
101. Negative correlation

**Section – B**

1. **Answer any FIVE of the following questions 3x5=15**
2. Define Statistics with an example. Give any two applications of Statistics in Business and Economics.
3. Define Nominal and Ordinal scale with an example for each.
4. Define causation and correlation with an example.
5. Define skewness and kurtosis.
6. Define Moments. Give the first four moments for a frequency distribution.
7. State any three properties of regression co-efficients.
8. Define the term ‘Dispersion’. In a frequency distribution of age of brides, the sum of the upper and the lower quartiles is 44 yrs. Their difference is 6 yrs. Find the coefficient of quartile deviation.

**Section – C**

1. **Answer any FIVE of the following questions: 7X5=35**
2. a) Show that the sum of squares of the deviations of a set of values is minimum when taken about the mean.

b) Define Geometric mean. Give its applications. (5+2)

1. a) What are Ogives? Explain the steps in the construction of two ogives.

b) Define coefficient of variation. State its significance. (5+2)

1. a) From the following data regarding wholesale and retail price of a commodity, estimate the retail price when the wholesale price is Rs. 240 per quintal.

|  |  |  |
| --- | --- | --- |
|  | Wholesale | Retail |
| Average Price(Rs/Quintal) | 200 | 280 |
| S.D(Rs/Quintal) | 20 | 25 |

The coefficient of correlation is r = 0.94.

b) Define Stem and Leaf diagram with an example.

 (5+2)

1. For the following frequency distribution, graphically find the mode.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Percentage Marks | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 |
| No. of Students | 8 | 19 | 29 | 36 | 25 | 13 | 4 |

1. a) Explain the concept of Multiple linear regression with an example.

b) Define contingency table in multivariate data analysis. (4+3)

1. Discuss the concept of Partition values in a frequency distribution. How do you find this graphically (7)
2. a) Briefly discuss the concept of multiple and partial correlation coefficients.

b) Name any two tools which can used for visualizing the multivariate data. (5+2)

**Section – D**

1. **Answer any THREE of the following questions: 3X10=30**
2. a) The following are the runs scored by two batsmen A and B in 10 innings.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | 101 | 27 | 0 | 36 | 82 | 45 | 7 | 13 | 65 | 14 |
| B | 97 | 12 | 40 | 96 | 13 | 8 | 85 | 8 | 56 | 15 |

 (i) Who is a better run scorer?

 (ii) Who is more consistent in scoring?

b) Write a short note on odd’s ratio in measures of association of attributes.

 (7+3)

1. a) The percentage of marks in Mathematics and Statistics of 10 students are given below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 43 | 96 | 74 | 38 | 35 | 43 | 22 | 56 | 35 | 80 |
| y | 30 | 94 | 84 | 13 | 30 | 18 | 30 | 41 | 48 | 95 |

Find the coefficient of Rank correlation and interpret your result.

b) Write a short note on Kendall’s Rank correlation.

 (6+4)

1. a) Briefly discuss the advantages and disadvantages of diagrams and graphs in statistics.

b) Two doctors X and Y measure the systolic blood pressure of two groups of men, and the results are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
|  | No. of Men | Mean Pressure | Standard Deviation |
| Doctor X | 113 | 159mm | 22.4mm |
| Doctor Y | 121 | 149mm | 20.0mm |

Find the mean and standard deviation for the two groups together. (4+6)

1. a) Derive the procedure of lines of regression fitted by the method least squares.

b) Write a short note on residual error variance. (7+3)