Q.P. Code : 00916

[Time: Three Hours]   [Marks:100]

Please check whether you have got the right question paper.

N.B: 1.   All questions are compulsory.
         2.   Use of calculator is allowed.

Q.1 (a) Correct the following if necessary. Justify each (correct or wrong) statement.   (10)
     1)   For leptokurtic distribution $\beta_2 = 3$.   (02)
     2)   Range is measure of central tendency.   (02)
     3)   Weight, height are examples of attributes.   (02)
     4)   Histogram is used to locate median.   (02)
     5)   To find average speed of journey weighted arithmetic mean is used.   (02)

Q.1 (b) Answer in one sentence.   (10)
     1)   When do we use harmonic mean?   (02)
     2)   Define Yule's coefficient of association, coefficient of colligation.   (02)
     3)   State the purpose of classification.   (02)
     4)   Define Bowley's coefficient of skewness. How do you decide skewness of distribution using it? (02)
     5)   What is Secondary data?   (02)

Q.2   Attempt any TWO sub-questions.   (20)
     1)   I) Derive conditions for consistency for three attributes.   (10)
          II) When two attributes are said to be a) Independent, b) Positively, c) Negatively associated?
     2)   Explain i) Nominal ii) Ordinal iii) Interval iv) Ratio scales of measurement.   (10)
     3)   I) Derive the mathematical relation between coefficient of association and coefficient of colligation. (10)
          II) Describe different parts of statistical table.
     4)   I) A survey of 1500 workers in a factory gave the following result. Tabulate the information. One third (10)
          of the workers were females, 80 percent of the female workers were below 40 while the percentage of
          male workers below 40 was 50. 80 percent of male workers below 40 were skilled and the remaining
          unskilled. 40 percent of male workers above 40 were skilled. There was no skilled female worker above
          40, while 50 percent of the female workers below 40 were skilled.
          II) State different methods of collecting primary data.

Q. 3   Attempt any Two sub-questions.   (20)
     (1) I) Find median, mode for the following data.   (10)

Age group	1-4	5-8	9-12	13-16
No of Children	50	44	39	12

          Ii) What are requisites of a good measure of central tendency?

     (2) I) Write note on i) frequency curve II) Less than type ogive.   (10)
          II) State the guidelines to decide number of classes and width of class in context with classification.

(3) I) 100 persons were interviewed by a public opinion polling agency.   (10)

Age (in year)	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
Number of persons	16	21	20	28	10	3	1	1

Find the (i) twenty fifth percentile, (ii) eight decile

(4) (II) State merits and demerits of geometric mean.   (10)
(I) Explain how Arithmetic mean can be calculated for i) raw data ii) unground frequency distribution (iii) Grouped frequency distribution.
II) Why arithmetic mean is better average than median or mode?

Q. 4   **Attempt any TWO sub-question.**   (20)
(1) I) Define r^{th} Raw moment about origin zero, and r^{th} central moment.   (10)
II) Show that standard deviation (S. D.) does not get affected by shift of origin but gets affected by change of scale for raw data.
III) State merits and demerits of mean deviation.

(2) I) Explain concept of skewness. Draw figures it indicate different types of skewedness and locate   (10)
roughly the relative positions of mean, mode, median.
II) Mean of certain distribution is 50. S.D. is 15 and coefficient of skewness is -1, find its median.

(3) I) How to find mean deviation about constant A? What should be the value of 'A' to have mean   (10)
deviation least?
ii) State coefficient of kurtosis. How we use it to decide type of kurtosis?

(4) Calculate (i) Semi inter quartile range (ii) Coefficient of quartile deviation (iii) Bowley's measure of   (10)
Skewness, for the following data representing age of bold donors abstain by 120 donors
Comment.

Age in years	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of donors	10	30	40	20	10	6	4

Q. 5   **Attempt any FOUR sub-questions.**   (20)
(1) Distinguish between (i) Qualitive and quantitative data. (ii) Simple random sampling with replacement   (05)
(SRSWR) and simple random sampling without replacement (SRSWOR).
(2) Write short note on Box and wishker plot.   (05)
(3) For two attributes A and B, we have (AB) =50. (A) = 1350, $(\alpha\beta)$ =350, N=1800 find coefficient of   (05)
association and coefficient of colligation and interpret the values.
(4) For a set of 20 observations $\sum x = 1452$, $\sum x^2 = 144280$ and mode = 63.7, find Karl Pearson' coefficient   (05)
of skewness. Comment on your result.
(5) Explain (i) Time series data (ii) Schedule (iii) Cross section data (iv) Questionnaire (v) Variable   (05)
(6) Define (i) Weighted Arithmetic mean, (ii) Combined mean, (iii) Combined Variance   (05)
(7) What are main objectives of tabulation?   (05)

****