(1)

59200

SET I - Solution

Q1(a)-1 ~~False~~ True, ~~(continuous variable)~~ (1)

2 True

3 False Upperlimit of class interval and cumulative frequency.

4 True

5 False. Least when calculated from Median

Q1(b)-1 Socio economic status of families

2 $Q = \frac{2y}{1+y^2}$

3 Stem : 34 Leaf : 5

4 Frequency

5 Median : $L_1 + \frac{\left(\frac{N}{2} - cf\right)}{f} \times l_2 - l_1$

Q2(a) Primary data - Data collected personally, Secondary data is the one which is obtained from published sources

Methods - 1 Direct Investigation, Ind

2 Indirect oral Investigation

3 Through Questionnaire

4 Through agencies

5 Investigation by enumerators

(b) $Q = \frac{2y}{1+y^2}$ in usual notation

(c) A good statistical Table is the one with systematic presentation of data in rows and columns.

Requirements : (1) Title

(2) Table Number

(3) Stubs & Captions

(4) Body

(5) Source Note & Footnote

(d)

A	B	β	A
α	αB	$\alpha\beta$	α
B	β	N	

$Q = -0.6828$

02

93- a AM = $\frac{\sum x_i}{n}$, GM = $\sqrt[n]{x_1 x_2 \cdots x_n}$ HM = $\frac{n}{\sum \frac{1}{x_i}}$

Proof AM > GM > HM in normal notation

b (a) Histogram — Graphical plot of data. Plot class intervals on x axis & draw rectangles of height frequency on the vertical axis. One of the important & useful methods of presenting a frequency distribution of a continuous variable.

b- (b) Ogive Curves — Another way of presenting continuous frequency distribution. These are of two types (1) Less than Type & (2) Greater than type. They are plotted by taking Upper limit & < Cumulative frequency and Lower limit & > Cumulative frequency

c $n_1 = 200$ $\bar{x}_1 = 15050$ $n_1 + n_2 = 300$ Combined $\bar{x} = 14700$
$n_2 = 100$

Combined mean $\bar{x} = \frac{n_1 \bar{x}_1 + n_2 \bar{x}_2}{n_1 + n_2}$ ∴

Mean monthly salary of female employees is Rs 14,000

d Mode for grouped frequency distribution —

$= l_1 + \frac{(l_2 - l_1)(f_1 - f_0)}{(f_1 - f_0) + (f_1 - f_2)}$; l_1 l_2 f_1 f_0 f_2 in usual notation.

Merits — 1 Easy to understand & simple to calculate
2 Not affected by extreme values
3 Can be determined graphically

Demerits — 1 Not based on all observations
2 Not capable of further mathematical treatment
3 Mode is insignificant for small data.

14 a Raw moment $\mu_r' = E(x^r)$ $r = 1, 2, 3, 4$

Central moment $\mu_r = E(x - \bar{x})^r$ $r = 1, 2, 3, 4$

Relation [illegible]

Q3

b Skewness → Departure from symmetry. Diagrams of positively & negatively skewed distributions

c Dispersion – spread of values or scatter of values.
Requisites – 1 Simple to understand and easy to calculate
2 Should be rigidly defined & based on all observations
3 Should be capable of further algebraic treatment
4 Should have sampling stability & not affected by extreme values.

d Karl Pearson's measure of skewness on base of moments
$= \beta_1 = \frac{\mu_3^2}{\mu_2^3}$

SD = 26 mode = 58 median = 52.67

Q5-a SRSWR – Unit is replaced Ex. Draw a card & replace it
SRSWOR – Unit is not replaced. Draw & card & keep it aside

b Secondary data collection Published & Unpublished
Sources. Govt Reports Journals, International agencies Newspapers, University records & research materials.

c Combined mean $\bar{x} = \frac{n_1\bar{x}_1 + n_2\bar{x}_2}{n_1+n_2}$ Weighted mean $= \frac{\sum w x}{\sum w_i}$
Explaining the relevant terms.

de $D_8 = l_1 + \left(\frac{8N - cf}{10}\right) \times \frac{l_2 - l_1}{f}$

$P_{52} = l_1 + \left(\frac{52N}{100} - cf\right) \times \frac{l_2 - l_1}{f}$

ed $Skp = \frac{3(Mean - Mode)}{SD}$ $Sk_B = \frac{Q_3 + Q_1 - 2Q_2}{Q_3 - Q_1}$

f Merit – Rigidly defined & easy to calculate
Demerit – Affected by extreme values, cannot be obtained