Formula
Chapter: 14
STATISTICS

1) Mean of Grouped Data: -

Class mark = $\frac{Upper\ class\ limit + Lower\ class\ limit}{2}$

(a) Direct Method

$$\overline{x} = \frac{\sum_{i=0}^{n} f_i x_i}{\sum_{i=0}^{n} f_i}$$

(b) Assumed Mean Method: -

$$\overline{x} = a + \frac{\sum_{i=0}^{n} f_i d_i}{\sum_{i=0}^{n} f_i}$$

(c) Step-deviation method

$$\overline{x} = a + \left(\frac{\sum_{i=0}^{n} f_i u_i}{\sum_{i=0}^{n} f_i}\right) \times h$$

2) Mode of Grouped Data: -

Mode = $l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$

l = lower limit of the modal class

h = size of the class interval

$f_1 = frequency\ of\ the\ modal\ class$

$f_0 = frequency\ of\ the\ class\ preceding\ the\ modal\ class.$

$f_2 = frequency\ of\ the\ class\ succeeding\ the\ modal\ class.$

3) Median of Grouped Data: -

n = Sum of frequency

(a) if 'n' is odd = $\frac{n+1}{2}$

(b) if 'n' is even = $\left(\frac{n}{2}\right), \left(\frac{n}{2}+1\right)$

(c) Median = $l + \left(\frac{\frac{n}{2} - cf}{f}\right) \times h$

l = lower limit of median class,
n = number of observations,
cf = cumulative frequency of class preceding the median class,
f = frequency of median class,
h = class size

4) Empirical relationship between the three measures of central tendency:

3 Median = Mode + 2 Mean