12. Mean = 9

$$\frac{x+x+3+x+5+x+7+x+10}{5} = 9$$

$$\Rightarrow 5x + 25 = 45$$
$$\Rightarrow 5x = 20$$
$$\Rightarrow x = 4$$

last 3 obs. are

$4+5,\ 4+7,\ 4+10$

$= 9, 11, 14$

$$\text{Mean} = \frac{9+11+14}{3}$$
$$= \frac{34}{3}$$
$$= 11\frac{1}{3} \quad (C)$$

13. $\bar{x} = \frac{x_1+x_2+x_3+\cdots+x_n}{n}$

$\Rightarrow n\bar{x} = x_1+x_2+x_3+\cdots+x_n$ ... (1)

$$\sum_{i=1}^{n}(x_i - \bar{x})$$

$= x_1 - \bar{x} + x_2 - \bar{x} + x_3 - \bar{x} + \ldots x_n - \bar{x}$

$= x_1+x_2+x_3+\cdots+x_n - n\bar{x}$

$= n\bar{x} - n\bar{x}$ [use i]

$= 0$ (B)

NCERT Exemplar Sols by Dev Anoop (Bathinda)

ex 14.1, exemplar ix

(14) let obs. be

$x_1, x_2, x_3, \ldots x_n$

$\bar{x}$ (Mean) $= \frac{x_1+x_2+x_3+\cdots+x_n}{n}$

$\Rightarrow n\bar{x} = x_1+x_2+x_3+\cdots+x_n$ ... (1)

Increased obs

$x_1+5,\ x_2+5,\ x_3+5,\ \ldots,\ x_n+5$

New Mean

$$= \frac{x_1+5+x_2+5+x_3+5+\ldots+x_n+5}{n}$$

$$= \frac{x_1+x_2+x_3+\cdots+x^n+5n}{n}$$

$$= \frac{n\bar{x}+5n}{n} \quad (\text{use } i)$$

$$= \frac{n(\bar{x}+5)}{n}$$

$$= \bar{x}+5$$

is increased by 5

(D)

(15)

$$\bar{x} = \frac{x_1+x_2+x_3+\cdots+x_n}{n}$$

$\Rightarrow n\bar{x} = x_1+x_2+x_3+\cdots+x_n$ ... (1)

Sim.

$n\bar{y} = y_1+y_2+y_3+\cdots+y_n$ ... (11)

$$\bar{z} = \frac{x_1+x_2+x_3+\cdots+x_n+y_1+y_2+y_3+\cdots+y_n}{2n}$$

$$= \frac{n\bar{x}+n\bar{y}}{2n} \quad \left| = \frac{\bar{x}+\bar{y}}{2}\right.$$

(B)