Exercise 14D

Question 9:

Let the given numbers be $x_1, x_2 \ldots\ldots\ldots x_{15}$

Then , the mean of these numbers =

$$\therefore \frac{(x_1 + x_2 + \ldots\ldots x_{15})}{15} = 27$$

$$\Rightarrow \quad x_1 + x_2 + \ldots\ldots x_{15} = 405$$

The new numbers are $(x_1 x 4) + (x_2 x 4) \ldots\ldots (x_{15} x 4)$

$$\therefore \text{Mean of the new numbers} = \frac{(x_1 x 4) + (x_2 x 4) \ldots\ldots (x_{15} x 4)}{15}$$

$$= \frac{405 x 4}{15} = \frac{1620}{15} = 108$$

$\therefore$ The new mean $= 108$

Question 10:

Let the given number be $x_1, x_2 \ldots x_{12}$

Then the mean of these numbers =40

$$\therefore \quad \frac{(x_1 + x_2 + \ldots\ldots + x_{12})}{12} = 40$$

$$\Rightarrow \quad x_1 + x_2 + \ldots\ldots + x_{12} = 480$$

$$\text{The new numbers} = \frac{(x_1 \div 8) + (x_1 \div 8) + \ldots\ldots + (x_{12} \div 8)}{12}$$

$$= \frac{480 \div 8}{12} = \frac{60}{12} = 5$$

$\therefore$ thenew mean $= 5$

Question 11:

Let the given numbers be $x_1, x_2, \ldots, x_{20}$

Let $\overline{X}$ be the mean of these numbers

$$\therefore \overline{X} = \frac{x_1 + x_2 + \ldots.. + x_{20}}{20} = 18$$

$$\Rightarrow x_1 + x_2 + \ldots + x_{20} = 18 \times 20 = 360 \ldots..(1)$$

But it is given that 3 is added to each of the first ten numbers.

Therefore, the first new ten numbers are

$(x_1 + 3), (x_2 + 3), \ldots, (x_{10} + 3)$

Let $\overline{X'}$ be the mean of new numbers

$(x_1 + 3), (x_2 + 3), \ldots, (x_{10} + 3), x_{11}, \ldots, x_{20}$.

$$\therefore \overline{X'} = \frac{(x_1 + 3) + (x_2 + 3) + \ldots.. + (x_{10} + 3) + x_{11} + \ldots + x_{20}}{20}$$

$$= \frac{(x_1 + x_2 + \ldots.. + x_{20}) + 3 \times 10}{20}$$

From (1), we know that $x_1 + x_2 + \ldots. + x_{20} = 360$

$\therefore$ Mean of the new set of 20 numbers

$$= \frac{360+30}{20} = \frac{390}{20} = 19.5$$

$\therefore$ Mean of the new set of 20 numbers = 19.5

*********** END **********