Exercise 1B

Questions 3:

(i) $x = 0.\bar{8}$ then,

$x = 0.8888.....$ ---------(1)

$\therefore 10x = 8.8888.....$ ---------(2)

On subtracting (1) from (2), we get

$$9x = 8 \Rightarrow x = \frac{8}{9}$$

$$\text{Hence, } 0.\bar{8} = \frac{8}{9}$$

(ii) $x = 2.\bar{4}$ then,

$x = 2.4444.....$ ---------(1)

$\therefore 10x = 24.444.....$ ---------(2)

On subtracting (1) from (2), we get

$$9x = 22 \Rightarrow x = \frac{22}{9}$$

(iii) $x = 0.\overline{24}$ then,

$x = 0.242424....$ -------(1)

$100x = 24.242424.....$ -----(2)

On subtracting (1) from (2), we get

$$99x = 24 \Rightarrow x = \frac{24}{99} = \frac{8}{33}$$

$$0.\overline{24} = \frac{8}{33}$$

(iv) $x = 0.1\bar{2}$, then

$x = 0.12222.....$

$10x = 1.2222.....$ -----(1)

$100x = 12.2222....$ -----(2)

Subtracting (1) from (2), we get

$$90x = 11 \qquad \therefore x = \frac{11}{90}$$

$$0.1\bar{2} = \frac{11}{90}$$

(v) $x = 2.2\overline{4}$, then,

$x = 2.24444$ ------(1)

$10x = 22.4444.....$ ------(2)

And $100x = 224.4444.....$ ------(3)

On subtracting (2) from (3), we get

$$\therefore\ 90x = 202 \Rightarrow x = \frac{202}{90} = \frac{101}{45}$$

(vi) $x = 0.3\overline{65}$, then

$x = 0.3656565$ ----(1)

$10x = 3.656565$ ----- (2)

$1000x = 365.656565$ ------ (3)

Subtracting (2) from (3), we get

$$x = 362 \Rightarrow x = \frac{362}{990} = \frac{181}{495}$$

$$0.3\overline{65} = \frac{181}{495}$$

Questions 4:

(i) 53.123456789 is a rational number since it is a terminating decimal.

(ii) $31.\overline{123456789}$ is a rational number because it is a non - terminating repeating decimal.

(iii) 0.12012001200012..... is not a rational number as it is a non-terminating, non - repeating decimal.

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