

3 (i)  $43.123456789$

$\therefore$  decimal representation is terminating

$\therefore$  given number is rational

If represented in the form of

$\frac{p}{q}$ ,  $q$  is of the form  $2^n 5^m$  where

$m, n \in \mathbb{N}$

(ii)  $0.120120012000120000\dots$

$\therefore$  decimal representation is non terminating

$\therefore$  given number is irrational

(iii)  $43.\overline{123456789}$

$\therefore$  decimal representation is non terminating repeating

$\therefore$  given number is rational

prime factors of  $q$  are not of the form  $2^n 5^m$  where  $m, n \in \mathbb{N}$