(vi) Let $x=\left(\sqrt{2}-2\right)^2$ be a rational number.

$x=\left(\sqrt{2}-2\right)^2$

$\Rightarrow x=2+4-4\sqrt{2}$

$\Rightarrow x=6-4\sqrt{2}$

$\Rightarrow \frac{x-6}{-4}=\sqrt{2}$

Since, x is rational number,

$\Rightarrow x-6$ is a rational nu8mber

$\Rightarrow \frac{x-6}{-4}$ is a rational number

$\Rightarrow \sqrt{2}$ is a rational number

But we know that $\sqrt{2}$ is an irrational number, which is a contradiction

So $\left(\sqrt{2}-\sqrt{2}\right)^2$ is an irrational number

(vii) Let $x=\left(2-\sqrt{2}\right)\left(2+\sqrt{2}\right)$

$\Rightarrow x=(2)^2-\left(\sqrt{2}\right)^2 \quad \left\{\text{As } (a+b)(a-b)=a^2-b^2\right\}$

$\Rightarrow x=4-2$

$\Rightarrow x=2$

So $\left(2-\sqrt{2}\right)\left(2+\sqrt{2}\right)$ is a rational number

(viii) Let $x=\left(\sqrt{2}+\sqrt{3}\right)^2$ be rational number

Using the formula $(a+b)^2=a^2+b^2+2ab$

$\Rightarrow x=\left(\sqrt{2}\right)^2+\left(\sqrt{3}\right)^2+2\left(\sqrt{2}\right)\left(\sqrt{3}\right)$

$\Rightarrow x=2+3+2\sqrt{6}$

$\Rightarrow x=5+2\sqrt{6}$

$\Rightarrow \frac{x-5}{2}=\sqrt{6}$

$\Rightarrow \frac{x-5}{2}$ is a rational number

$\Rightarrow \sqrt{6}$ is a rational number

But we know that $\sqrt{6}$ is an irrational number

So, we arrive at a contradiction

So $\left(\sqrt{2}+\sqrt{3}\right)^2$ is an irrational number.

(ix) Let $x = \sqrt{5} - 2$ be the rational number

Squaring on both sides, we get

$x = \sqrt{5} - 2$

$x^2 = (\sqrt{5} - 2)^2$

$x^2 = 25 + 4 - 4\sqrt{5}$

$x^2 - 29 = -4\sqrt{5}$

$\frac{x^2 - 29}{-4} = \sqrt{5}$

Now, x is rational

x^2 **is rational.**

So, $x^2 - 29$ **is rational**

$\frac{x^2 - 29}{-4} = \sqrt{5}$ **is rational.**

But, $\sqrt{5}$ is irrational. So we arrive at contradiction

Hence $x = \sqrt{5} - 2$ is an irrational number

(x) Let

$x = \sqrt{23}$

$x = 4.79583...$

It is non-terminating or non-repeating

Hence $\sqrt{23}$ is an irrational number

(xi) Let $x = \sqrt{225}$

$\Rightarrow x = 15$

Hence $\sqrt{225}$ is a rational number

(xii) Given 0.3796.

It is terminating

Hence it is a rational number

(xiii) Given number $x = 7.478478...$

$\Rightarrow x = 7.\overline{478}$

It is repeating

Hence it is a rational number

(xiv) Given number is $x = 1.1010010001...$

It is non-terminating or non-repeating

Hence it is an irrational number

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