6.

Proof:

Proof by contradiction.

Assume there are at least one prime triple expect for 3,5,7

i.e., exists prime number n>3, that n, n+2, n+4 are prime number

Since any natural number is even or odd, if n is even or odd, n+2, n+4 are even or odd

When n is even, then n can be written as the form 2x, $x \in \mathbb{N}$, and x>1

If n=2x, then n+2=2x+2=2(x+1), n+4=2x+4=2(x+2). So n+2 and n+4 can be divided by 2, which is a contradiction.

When n is odd, then n can be written as the form 3x, 3x+2, 3x+4, here n>1 and n is odd.

if n is the form of 3x, n is divisible by 3, so n is not a prime. Contradiction.

If n is the form of 3x+2, n+4=3x+6=3(x+2), which is divisible by 3, so n+4 is not a prime. Contradiction.

If n is the form of 3x+4, n+2=3x+6=3(x+2), which is divisible by 3, so n+2 is not a prime. Contradiction.

So we have proved that when n is even or odd, n, n+2, n+4 can not be prime number if n>3. The statement has been proved.