Permutations Ex 16.1 Q4(iii)

We have,

$$(n+1)(n+2)(n+3)\ldots\ldots\ldots(2n)$$

$$=\left[1\times2\times3\times4\ldots\ldots\ldots\ldots(n-1)n\right]\times(n+1)(n+2)..(2n-1)\times2n$$

$$\left[1\times2\times3\times4\ldots\ldots\ldots\ldots(n-1)n\right]$$

$$=\frac{(2n!)!}{n!}$$

Permutations Ex 16.1 Q4(iv)

We have,

$$1\times\times5\times7\times9\ldots\ldots\ldots\ldots(2n-1)$$

$$=\frac{\left[1.3.5.7.9\ldots\ldots(2n-1)\right].\left[2.4.6.8\ldots\ldots\ldots(2n-2)(2n)\right]}{2.4.6.8\ldots\ldots(2n-2)(2n)}$$

$$=\frac{\left[1.3.5.7.9\ldots\ldots\ldots(2n-1)\right].\left[2.4.6.8\ldots\ldots(2n-2)(2n)\right]}{2^n\left[1.2.3.4\ldots\ldots\ldots\left((n-1)(n)\right)\right]}$$

$$=\frac{1.2.3.4.5.6.7.8\ldots\ldots\ldots(2n-2)(2n-1)(2n)}{2^n.n!}$$

$$=\frac{(2n)!}{2^n.n!}$$

$$\therefore\quad 1.3.5.7.9\ldots\ldots\ldots(2n-1)=\frac{(2n)!}{2^n.n!}$$

Permutations Ex 16.1 Q5

(i) $LHS = (2+3)!$

$= 5!$

$= 5 \times 4 \times 3 \times 2 \times 1$

$= 120$

and, $RHS = 2! + 3!$

$= 2 \times 1 + 3 \times 2$

$= 2 \times 1 + 3 \times 2 \times 1$

$= 2 + 6$

$= 8$

$\therefore \quad 120 \neq 8$

$\therefore \quad (2+3)! \neq 2! + 3!$

So, it is false.

(ii) $LHS = (2 \times 3)!$

$= 6!$

$= 6 \times 5 \times 4 \times 3 \times 2 \times 1$

$= 720$

and, $RHS = 2! \times 3!$

$= 2 \times 1 \times 3 \times 2$

$= 12$

$\therefore \quad 720 \neq 12$

$\therefore \quad (2 \times 3)! \neq 2! \times 3!$

Hence, it is false.

Permutations Ex 16.1 Q6

$LHS = n! + (n+1)!$

$= n! + (n+1)(n+1-1)!$

$= n! + (n+1)n!$

$= n!(1 + n + 1)$

$= n!(n+2)$

$= LHS$

$\therefore \quad n!(n+2) = n! + (n+1)!$

Hence, proved

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