EXERCISE 2.3 **PAGE NO: 2.22**

1. Express the following numbers in standard form:
(i) 6020000000000000
Solution:

To express 6020000000000000 in standard form, count the total digits leaving 1st digit from the left. So the total number of digits becomes the power of 10. Therefore the decimal comes after the 1st digit.

the total digits leaving 1st digit from the left is 15

∴ the standard form is 6.02×10^{15}

(ii) 0.00000000000942
Solution:

To express 0.00000000000942 in standard form,

Any number after the decimal point the powers become negative. Total digits after decimal is 12

∴ the standard form is 9.42×10^{-12}

(iii) 0.00000000085
Solution:

To express 0.00000000085 in standard form,

Any number after the decimal point the powers become negative. Total digits after decimal is 10

∴ the standard form is 8.5×10^{-10}

(iv) 846 × 10⁷
Solution:

To express 846×10^7 in standard form, count the total digits leaving 1st digit from the left. So the total number of digits becomes the power of 10. Therefore the decimal comes after the 1st digit.

the total digits leaving 1st digit from the left is 2

$846 \times 10^7 = 8.46 \times 10^2 \times 10^7 = 8.46 \times 10^{2+7} = 8.46 \times 10^9$

(v) 3759 × 10⁻⁴
Solution:

To express 3759×10^{-4} in standard form, count the total digits leaving 1st digit from the left. So the total number of digits becomes the power of 10. Therefore the decimal comes after the 1st digit.

the total digits leaving 1st digit from the left is 3

$3759 \times 10^{-4} = 3.759 \times 10^3 \times 10^{-4} = 3.759 \times 10^{3+(-4)} = 3.759 \times 10^{-1}$

(vi) 0.00072984
Solution:
To express 0.00072984 in standard form,
Any number after the decimal point the powers become negative. Total digits after decimal is 4
∴ the standard form is 7.2984×10^{-4}

(vii) 0.000437×10^4
Solution:
To express 0.000437×10^4 in standard form,
Any number after the decimal point the powers become negative. Total digits after decimal is 4
∴ the standard form is $4.37 \times 10^{-4} \times 10^4 = 4.37$

(viii) 4 ÷ 100000
Solution:
To express in standard form count the number of zeros of the divisor. This count becomes the negative power of 10.
∴ the standard form is 4×10^{-5}

2. Write the following numbers in the usual form:
(i) 4.83×10^7
Solution:
When the powers are positive the usual form of number is written after the multiplication of the given number, then place the decimal point after counting from right.
$4.83 \times 10000000 = 4830000000$
48300000.00
∴ the usual form is 48300000

(ii) 3.02×10^{-6}
Solution:
When the powers are negative the decimal is placed to the left of the number.
3.02×10^{-6} here, the power is -6, so the decimal shifts 6 places to left.
∴ the usual form is 0.00000302

(iii) 4.5×10^4
Solution:

When the powers are positive the usual form of number is written after the multiplication of the given number, then place the decimal point after counting from right.
$4.5 \times 10000 = 450000$
45000.0
∴ the usual form is 45000

(iv) 3×10^{-8}
Solution:
When the powers are negative the decimal is placed to the left of the number.
3×10^{-6} here, the power is -8, so the decimal shifts 8 places to left.
∴ the usual form is 0.00000003

(v) 1.0001×10^9
Solution:
When the powers are positive the usual form of number is written after the multiplication of the given number, then place the decimal point after counting from right.
$1.0001 \times 1000000000 = 10001000000000$
1000100000.0000
∴ the usual form is 1000100000

(vi) 5.8×10^2
Solution:
When the powers are positive the usual form of number is written after the multiplication of the given number, then place the decimal point after counting from right.
$5.8 \times 100 = 5800$
580.0
∴ the usual form is 580

(vii) 3.61492×10^6
Solution:
When the powers are positive the usual form of number is written after the multiplication of the given number, then place the decimal point after counting from right.
$3.61492 \times 1000000 = 361492000000$
3614920.00000
∴ the usual form is 3614920

(vii) 3.25×10^{-7}
Solution:
When the powers are negative the decimal is placed to the left of the number.

3.25×10^{-7} here, the power is -7, so the decimal shifts 7 places to left.

∴ the usual form is 0.000000325