Exercise 12.2 Page No: 200

1. Express the following numbers in standard form.

(i) 0.0000000000085
(ii) 0.00000000000942
(iii) 6020000000000000
(iv) 0.00000000837
(v) 31860000000

Solution:

(i) 0.0000000000085 = 0.0000000000085 x 10^12 / 10^12 = 8.5×10^{-12}

(ii) 0.00000000000942 = 0.00000000000942 x 10^12 / 10^12 = 9.42×10^{-12}

(iii) 6020000000000000 = 6020000000000000 x 10^15/ 10^15 = 6.02×10^{15}

(iv) 0.00000000837 = = 0.00000000837 x 10^9 / 10^9 = 8.37×10^{-9}

(v) 31860000000 = 31860000000 x 10^10/ 10^10 = 3.186×10^{10}

2. Express the following numbers in usual form.

(i) 3.02×10^{-6}
(ii) 4.5×10^{4}
(iii) 3×10^{-8}
(iv) 1.0001×10^{9}
(v) 5.8×10^{12}
(vi) 3.61492×10^{6}

Solution:

(i) $3.02 \times 10^{-6} = 3.02/ 10^6 = 0.00000302$

(ii) $4.5 \times 10^{4} = 4.5 * 10000 = 45000$

(iii) $3 \times 10^{-8} = 3/10^8 = 0.00000003$

(iv) $1.0001 \times 10^{9} = 1000100000$

(v) $5.8 \times 10^{12} = 5.8 * 1000000000000 = 5800000000000$

(vi) 6. $3.61492 \times 10^{6} = 3.61492 \times 1000000 = 3614920$

3. Express the number appearing in the following statements in standard form.
(i) 1 micron is equal to 1/1000000 m.
(ii) Charge of an electron is 0.000, 000, 000, 000, 000, 000, 16 coulomb.
(iii) Size of bacteria is 0.0000005 m
(iv) Size of a plant cell is 0.00001275 m
(v) Thickness of a thick paper is 0.07 mm

Solution :

(i) 1 micron = 1/1000000

= 1/10^6

= 1×10^{-6}

(ii) Charge of an electron is 0.00000000000000000016 coulombs.

= 0.00000000000000000016 x 10^19 / 10^19

= 1.6×10^{-19} coulomb

(iii) Size of bacteria = 0.0000005

= 5/10000000 = 5/10^7 = 5 x 10^-7 m

(iii) Size of a plant cell is 0.00001275 m

= 0.00001275 x 10^5/ 10^5

= $1.275 \times 10^{-5}\ m$

(v) Thickness of a thick paper = 0.07 mm

0.07 mm = 7/100 mm = 7/10^2 = 7 x 10^{-2} mm

4. In a stack there are 5 books each of thickness 20 mm and 5 paper sheets each of thickness 0.016 mm. What is the total thickness of the stack?

Solution:

Thickness of one book = 20 mm

Thickness of 5 books = 20 x 5 = 100 mm

Thickness of one paper = 0.016 mm

Thickness of 5 papers = 0.016 x 5 = 0.08 mm

Total thickness of a stack = 100 + 0.08 = 100.08 mm

= 100.08 × 10^2 / 10^2 mm

$= 1.0008 \times 10^2$ mm