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) $0.0000000000085 = 0.0000000000085\times(10^{12}/10^{12}) = 8.5\times10^{-12}$

(ii) $0.00000000000942 = 0.00000000000942\times(10^{12}/10^{12}) = 9.42\times10^{-12}$

(iii) $6020000000000000 = 6020000000000000\times(10^{15}/10^{15}) = 6.02\times10^{15}$

(iv) $0.00000000837 = 0.00000000837\times(10^{9}/10^{9}) = 8.37\times10^{-9}$

(v) $31860000000 = 31860000000\times(10^{10}/10^{10}) = 3.186\times10^{10}$

2. Express the following numbers in the 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) $3.02\times10^{-6} = 3.02/10^{6} = 0\ .00000302$

(ii) $4.5\times10^{4} = 4.5\times10000 = 45000$

(iii) $3\times10^{-8} = 3/10^{8} = 0.00000003$

(iv) $1.0001\times10^{9} = 1000100000$

(v) $5.8\times10^{12} = 5.8\times1000000000000 = 5800000000000$

(vi) $3.61492\times10^{6} = 3.61492\times1000000 = 3614920$

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

$= 1/10^{6}$

$= 1\times10^{-6}$

(ii) Charge of an electron is 0.0000000000000000016 coulombs

$= 0.0000000000000000016\times10^{19}/10^{19}$

$= 1.6\times10^{-19}$ coulomb

(iii) Size of bacteria = 0.0000005

$= 5/10000000 = 5/10^{7} = 5\times10^{-7}$ m

(iv) Size of a plant cell is 0.00001275 m

$= 0.00001275\times10^{5}/10^{5}$

$= 1.275\times10^{-5}$m

(v) Thickness of a thick paper = 0.07 mm

0.07 mm $= 7/100$ mm $= 7/10^{2} = 7\times10^{-2}$ mm

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

Solution:

Thickness of one book = 20 mm

Thickness of 5 books = 20×5 = 100 mm

Thickness of one paper = 0.016 mm

Thickness of 5 papers = 0.016×5 = 0.08 mm

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

= $100.08 \times 10^2 / 10^2$ mm

$= 1.0008 \times 10^2$ mm