NCERT Solutions for Class 8 Maths Chapter 10 Exponents and Powers Ex 10.2

Ex 10.2 Class 8 Maths Question 1.

Express the following numbers in standard form:

(i) 0.0000000000085

(ii) 0.00000000000942

(iii) 6020000000000000

(iv) 0.00000000837

(v) 31860000000

Solution:

$(i)\ 0.0000000000085$

$$= \frac{85}{10000000000000} = \frac{8.5 \times 10}{10^{13}}$$

$$= 8.5 \times 10^{1-13} = 8.5 \times 10^{-12}$$

Hence, the required standard form

$$= 8.5 \times 10^{-12}$$

$(ii)\ 0.00000000000942$

$$= \frac{942}{100000000000000}$$

$$= \frac{9.42 \times 100}{100000000000000} = \frac{9.42 \times 10^2}{10^{14}}$$

$$= 9.42 \times 10^{2-14} = 9.42 \times 10^{-12}$$

Hence, the required standard form

$$= 9.42 \times 10^{-12}$$

(iii) 6020000000000000

$= 6.02 \times 1000000000000000$

$= 6.02 \times 10^{15}$

Hence, the required standard form

$= 6.02 \times 10^{15}$

(iv) 0.00000000837

$$= \frac{837}{100000000000}$$

$$= \frac{8.37 \times 100}{100000000000} = \frac{8.37 \times 10^2}{10^{11}}$$

$= 8.37 \times 10^{2-11} = 8.37 \times 10^{-9}$

Hence, the required standard from

$= 8.37 \times 10^{-9}$

(v) 31860000000

$= 3.186 \times 10000000000$

$= 3.186 \times 10^{10}$

Hence, the required standard from = 3.186×10^{10}

Ex 10.2 Class 8 Maths Question 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*) 3.02×10^{-6}

$= 3.02 \times \frac{1}{10^6} = \frac{302}{100 \times 10^6}$

$= \frac{302}{10^2 \times 10^6} = \frac{302}{10^{2+6}} = \frac{302}{10^8}$

$= 302 \times 10^{-8}$

$= 0.00000302$

Hence, $3.02 \times 10^{-6} = 0.00000302$

(*ii*) 4.5×10^4

$= \frac{45}{10} \times 10^4 = 45 \times 10^{4-1}$

$= 45 \times 10^3 = 45000$

Hence, $4.5 \times 10^4 = 45000$

(*iii*) 3×10^{-8}

$= 3 \times \frac{1}{10^8} = \frac{3}{100000000}$

$= 0.00000003$

Hence, $3 \times 10^{-8} = 0.00000003$

(*iv*) 1.0001×10^9

$= \frac{10001}{10000} \times 10^9 = \frac{10001}{10^4} \times 10^9$

$= 10001 \times 10^{9-4} = 10001 \times 10^5$

Hence, $1.0001 \times 10^9 = 1000100000$

$(v)\ 5.8 \times 10^{12}$

$$= \frac{58}{10} \times 10^{12} = 58 \times 10^{12-1}$$

$$= 58 \times 10^{11}$$

$$= 5800000000000$$

Hence, $5.8 \times 10^{12} = 5800000000000$

$(vi)\ 3.61492 \times 10^{6}$

$$= \frac{361492}{100000} \times 10^{6}$$

$$= \frac{361492 \times 10^{6}}{10^{5}}$$

$$= 361492 \times 10^{6-5}$$

$$= 361492 \times 10$$

$$= 3614920$$

Hence, $3.61492 \times 10^{6} = 3614920$

Ex 10.2 Class 8 Maths Question 3.

Express the number appearing in the following statements in standard form.

1

(i) 1 micron is equal to m.

1000000

(ii) Charge of an electron is 0.000,000,000,000,000,000,16 coulomb

(iii) Size of a 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:

$(i)\ 1 \text{ micron} = \frac{1}{1000000}$

$$= \frac{1}{10^{6}} \text{ m}$$

$$= 10^{-6} \text{ m}$$

(ii) Charge of an election

$$= 0.000,000,000,000,000,000,16$$

$$= \frac{16}{1,000,000,000,000,000,000,00}$$

$$= \frac{1.6 \times 10}{1,000,000,000,000,000,000,00}$$

$$= \frac{1.6 \times 10}{10^{20}} = 1.6 \times 10^{1-20} = 1.6 \times 10^{-19}$$

(*iii*) Size of a bacteria = 0.0000005 m

$$= \frac{5}{10000000} \text{ m}$$

$$= \frac{0.5 \times 10}{10^{7}} \text{ m} = 0.5 \times 10^{1-7} \text{ m}$$

$$= 0.5 \times 10^{-6 \text{ m}} = 5 \times 10^{-7} \text{ m}$$

(*iv*) Size of a plant cell = 0.00001275 m

$$= \frac{1275}{100000000} \text{ m}$$

$$= \frac{1.275 \times 10^{3}}{10^{8}} \text{ m}$$

$$= 1.275 \times 10^{3-8}$$

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

(*v*) Thickness of a thick paper = 0.07 mm

$$= \frac{7}{100} \text{ mm}$$

$$= \frac{0.7 \times 10}{10^{2}} = 0.7 \times 10^{1-2}$$

$$= 0.7 \times 10^{-1} \text{ mm} = 7 \times 10^{-2} \text{ mm}$$

Ex 10.2 Class 8 Maths Question 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 books = 5 × 20 = 100 mm

Thickness of 5 paper sheets = 5 × 0.016 mm = 0.080 mm.

Total thickness of the stack = 100 mm + 0.080 mm = 100.080 mm = 1.0008×10^{2} mm