

Mathematics

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(Chapter – 12) (Exponents and Powers)
(Class – VIII)

Exercise 12.2

Question 1:

Express the following numbers in standard form:

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

Answer 1:

- (i) $0.0000000000085 = 0.0000000000085 \times \frac{10^{12}}{10^{12}} = 8.5 \times 10^{-12}$
- (ii) $0.00000000000942 = 0.00000000000942 \times \frac{10^{12}}{10^{12}} = 9.42 \times 10^{-12}$
- (iii) $6020000000000000 = 6020000000000000 \times \frac{10^{15}}{10^{15}} = 6.02 \times 10^{15}$
- (iv) $0.00000000837 = 0.00000000837 \times \frac{10^9}{10^9} = 8.37 \times 10^{-9}$
- (v) $31860000000 = 31860000000 \times \frac{10^{10}}{10^{10}} = 3.186 \times 10^{10}$

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

Answer 2:

- (i) $3.02 \times 10^{-6} = \frac{3.02}{10^6} = 0.00000302$
- (ii) $4.5 \times 10^4 = 4.5 \times 10000 = 45000$
- (iii) $3 \times 10^{-8} = \frac{3}{10^8} = 0.00000003$
- (iv) $1.0001 \times 10^9 = 1000100000$
- (v) $5.8 \times 10^{12} = 5.8 \times 1000000000000 = 5800000000000$
- (vi) $3.61492 \times 10^6 = 3.61492 \times 1000000 = 3614920$

Question 3:

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

- (i) 1 micron is equal to $\frac{1}{1000000}$ m.
- (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.

Answer 3:

- (i) 1 micron = $\frac{1}{1000000} = \frac{1}{10^6} = 1 \times 10^{-6}$ m

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- (ii) Charge of an electron is 0.00000000000000000016 coulombs.
 $= 0.00000000000000000016 \times \frac{10^{19}}{10^{19}} = 1.6 \times 10^{-19}$ coulomb
- (iii) Size of bacteria = $0.00000005 = \frac{5}{10000000} = \frac{5}{10^7} = 5 \times 10^{-7}$ m
- (iv) Size of a plant cell is 0.00001275 m = $0.00001275 \times \frac{10^5}{10^5} = 1.275 \times 10^{-5}$ m
- (v) Thickness of a thick paper = $0.07 \text{ mm} = \frac{7}{100} \text{ mm} = \frac{7}{10^2} = 7 \times 10^{-2}$ mm

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?



Answer 4:

Thickness of one book = 20 mm

Thickness of 5 books = $20 \times 5 = 100$ mm

Thickness of one paper = 0.016 mm

Thickness of 5 papers = $0.016 \times 5 = 0.08$ mm

Total thickness of a stack = $100 + 0.08$

= 100.08 mm

= $100.08 \times \frac{10^2}{10^2} = 1.0008 \times 10^2$ mm

