Exercise 5B

Q1

Answer :

(i) $538 = 5.38 \times 10^2$ [since the decimal point is moved 2 places to the left]

(ii) $6428000 = 6.428 \times 10^6$ [since the decimal point is moved 6 places to the left]

(iii) $82934000000 = 8.2934 \times 10^{10}$ [since the decimal point is moved 10 places to the left]

(iv) $940000000000 = 9.4 \times 10^{11}$ [since the decimal point is moved 11 places to the left]

(v) $23000000 = 2.3 \times 10^7$ [since the decimal point is moved 7 places to the left]

Q2

Answer :

(i) Diameter of the Earth = 1.2756×10^7 m
[since the decimal point is moved 7 places to the left]

(ii) Distance between the Earth and the Moon = 3.84×10^8 m
[since the decimal point is moved 8 places to the left]

(iii) Population of India in March 2001 = 1.027×10^9
[since the decimal point is moved 9 places to the left]

(iv) Number of stars in a galaxy = 1.0×10^{11}
[since the decimal point is moved 11 places to the left]

(v) Present age of the universe = 1.2×10^{10} years
[since the decimal point is moved 10 places to the left]

Q3

Answer :

(i) $684502 = 6 \times 10^5 + 8 \times 10^4 + 4 \times 10^3 + 5 \times 10^2 + 0 \times 10^1 + 2 \times 10^0$
(ii) $4007185 = 4 \times 10^6 + 0 \times 10^5 + 0 \times 10^4 + 7 \times 10^3 + 1 \times 10^2 + 8 \times 10^1 + 5 \times 10^0$
(iii) $5807294 = 5 \times 10^6 + 8 \times 10^5 + 0 \times 10^4 + 7 \times 10^3 + 2 \times 10^2 + 9 \times 10^1 + 4 \times 10^0$
(iv) $50074 = 5 \times 10^4 + 0 \times 10^3 + 0 \times 10^2 + 7 \times 10^1 + 4 \times 10^0$

Note: $a^0 = 1$

Q4

Answer :

(i) $6 \times 10^4 + 3 \times 10^3 + 0 \times 10^2 + 7 \times 10^1 + 8 \times 10^0$
$= 6 \times 10000 + 3 \times 1000 + 0 \times 100 + 7 \times 10 + 8 \times 1 = 63078$

(ii) $9 \times 10^6 + 7 \times 10^5 + 0 \times 10^4 + 3 \times 10^3 + 4 \times 10^2 + 6 \times 10^1 + 2 \times 10^0$
$= 9 \times 1000000 + 7 \times 100000 + 0 \times 10000 + 3 \times 1000 + 4 \times 100 + 6 \times 10 + 2 \times 1 = 9703462$

(iii) $8 \times 10^5 + 6 \times 10^4 + 4 \times 10^3 + 2 \times 10^2 + 9 \times 10^1 + 6 \times 10^0$
$= 8 \times 100000 + 6 \times 10000 + 4 \times 1000 + 2 \times 100 + 9 \times 10 + 6 \times 1 = 864296$

Q3

Answer :

(c) $\frac{1}{16}$

We have:

$$\left(2^{-1}-4^{-1}\right)^2=\left(\frac{1}{2}-\frac{1}{4}\right)^2$$
$$=\left(\frac{2-1}{4}\right)^2 \quad \text{[since L.C.M. of 2 and 4 is 4]}$$
$$=\left(\frac{1}{4}\right)^2$$
$$=\left(\frac{1}{4}\times\frac{1}{4}\right)=\frac{1}{16}$$

Q4

Answer :

(b) 29

We have:

$$\left(\frac{1}{2}\right)^{-2}+\left(\frac{1}{3}\right)^{-2}+\left(\frac{1}{4}\right)^{-2}=\left(\frac{2}{1}\right)^2+\left(\frac{3}{1}\right)^2+\left(\frac{4}{1}\right)^2 \qquad \left[since\left(\frac{a}{b}\right)^{-1}=\left(\frac{b}{a}\right)^1\right]$$
$$= (2^2 + 3^2 + 4^2)$$
$$= (4 + 9 + 16)$$
$$= 29$$

********** END **********