Exercise 6.1

Q1. Find the values of each of the following :

(i) 13^2

(ii) 7^3

(iii) 3^4

Sol:

(i) $13^2 = 13 \times 13$

$= 169$

(ii) $7^3 = 7 \times 7 \times 7$

$= 4$

(iii) $3^4 = 3 \times 3 \times 3 \times 3$

$= 81$

Q2. Find the value of each of the following :

(i) $(-7)^2$

(ii) $(-3)^4$

(iii) $(-5)^5$

Sol:

We know that if 'a' is a natural number, then

$(-a)^{even\ number}$ = positive number

$(-a)^{odd\ number}$ = negative number

We have,

(i) $(-7)^2 = (-7) \times (-7)$

$= 49$

(ii) $(-3)^4$ = (-3) ×(-3) ×(-3) ×(-3)

= 81

(iii) $(-5)^5$ = (-5) ×(-5) ×(-5) ×(-5) ×(-5)

= -3125

Q3. Simply :

(i) 3×10^2

(ii) $2^2 \times 5^3$

(iii) $3^3 \times 5^2$

Sol:

(i) 3×10^2 = 3×10×10

= 3×100

= 300

(ii) $2^2 \times 5^3$ = 2×2×5×5×5

= 4×125

= 500

(iii) $3^3 \times 5^2$ = 3×3×3×5×5

= 27×25

= 675

Q4. Simply :

(i) $3^2 \times 10^4$

(ii) $2^4 \times 3^2$

(iii) $5^2 \times 3^4$

Sol:

(i) $3^2 \times 10^4$ = 3×3×10×10×10×10

= 9×10000

= 90000

(ii) $2^4 \times 3^2$ = 2×2×2×2×3×3

= 16×9

= 144

(iii) $5^2 \times 3^4$ = 5×5×3×3×3×3

= 25×81

= 2025

Q5. Simply :

(i) $(-2) \times (-3)^3$

(ii) $(-3)^2 \times (-5)^3$

(iii) $(-2)^5 \times (-10)^2$

Sol:

(i) $(-2) \times (-3)^3$ = (-2) ×(-3) ×(-3) ×(-3)

= (-2) ×(-27)

= 54

(ii) $(-3)^2 \times (-5)^3$ = (-3) ×(-3) ×(-5) ×(-5) ×(-5)

= 9×(-125)

= -1125

(iii) $(-2)^5 \times (-10)^2$ = (-2) ×(-2) ×(-2) ×(-2) ×(-2) ×(-10) ×(-10)

= (-32) × 100

= -3200

Q6. Simply :

(i) $(\frac{3}{4})^2$

(ii) $(\frac{-2}{3})^4$

(iii) $(\frac{-4}{5})^5$

Sol:

(i) $(\frac{3}{4})^2 = \frac{3\times3}{4\times4}$

$= \frac{9}{16}$

(ii) $(\frac{-2}{3})^4 = \frac{(-2)\times(-2)\times(-2)\times(-2)}{3\times3\times3\times3}$

$= \frac{16}{81}$

(iii) $(\frac{-4}{5})^5 = \frac{(-4)\times(-4)\times(-4)\times(-4)\times(-4)}{5\times5\times5\times5\times5}$

$= \frac{-1024}{3125}$

Q7. Identify the greater number in each of the following

(i) 2^5 or 5^2

(ii) 3^4 or 4^3

(iii) 3^5 or 5^3

Sol:

(i) 2^5 or 5^2

=> $2^5 = 2\times2\times2\times2\times2$

$= 32$

=> $5^2 = 5\times5$

$= 25$

Therefore, $2^5 > 5^2$

(ii) 3^4 or 4^3

=> 3^4 = 3×3×3×3

= 81

=> 4^3 = 4×4×4

= 64

Therefore, $3^4 > 4^3$

(iii) 3^5 or 5^3

=> 3^5 = 3×3×3×3×3

= 243

=> 5^3 = 5×5×5

= 125

Therefore, $3^5 > 5^3$

Q8. Express each of the following in exponential form

(i) (-5) ×(-5) ×(-5)

(ii) $(\frac{-5}{7} \times \frac{-5}{7} \times \frac{-5}{7} \times \frac{-5}{7})$

(iii) $(\frac{4}{3} \times \frac{4}{3} \times \frac{4}{3} \times \frac{4}{3} \times \frac{4}{3})$

Sol:

(i) (-5) ×(-5) ×(-5) = $(-5)^3$

(ii) $(\frac{-5}{7} \times \frac{-5}{7} \times \frac{-5}{7} \times \frac{-5}{7}) = (\frac{-5}{7})^4$

(iii) $(\frac{4}{3} \times \frac{4}{3} \times \frac{4}{3} \times \frac{4}{3} \times \frac{4}{3}) = (\frac{4}{3})^5$

Q9. Express each of the following in exponential form

(i) x ×x ×x ×x ×a ×a ×b ×b ×b

(ii) (-2) ×(-2) ×(-2) ×(-2) ×a×a×a

(iii) $(\frac{-2}{3}) \times (\frac{-2}{3}) \times x \times x \times x$

Sol:

(i) x ×x ×x ×x ×a ×a ×b ×b ×b = $x^4a^2b^3$

(ii) (-2) ×(-2) ×(-2) ×(-2) ×a×a×a = $(-2)^4a^3$

(iii) $(\frac{-2}{3}) \times (\frac{-2}{3}) \times x \times x \times x = (\frac{-2}{3})^2x^3$

Q10. Express each of the following numbers in exponential form

(i) 512

(ii) 625

(iii) 729

Sol:

(i) 512 = 2^9

(iii) 625 = 5^4

(iii) 729 = 3^6

Q11. Express each of the following numbers as a product of powers of their prime factors

(i) 36

(ii) 675

(iii) 392

Sol:

(i) 36 = $2 \times 2 \times 3 \times 3$

= $2^2 \times 3^2$

(ii) 675 = $3 \times 3 \times 3 \times 5 \times 5$

= $3^3 \times 5^2$

(iii) 392 = $2 \times 2 \times 2 \times 7 \times 7$

= $2^3 \times 7^2$

Q12. Express each of the following numbers as a product of powers of their prime factors

(i) 450

(ii) 2800

(iii) 24000

Sol:

(i) 450 = $2 \times 3 \times 3 \times 5 \times 5$

= $2 \times 3^2 \times 5^2$

(ii) 2800 = $2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 7$

= $2^4 \times 5^2 \times 7$

(iii) 24000 = $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 5$

= $2^5 \times 3 \times 5^3$

Q13. Express each of the following as a rational number of the form $\frac{p}{q}$

(i) $(\frac{3}{7})^2$

(ii) $(\frac{7}{9})^3$

(iii) $(\frac{-2}{3})^4$

Sol:

(i) $(\frac{3}{7})^2 = \frac{3\times3}{7\times7}$

$= \frac{9}{49}$

(ii) $(\frac{7}{9})^3 = \frac{7\times7\times7}{9\times9\times9}$

$= \frac{343}{729}$

(iii) $(\frac{-2}{3})^4 = \frac{(-2)\times(-2)\times(-2)\times(-2)}{3\times3\times3\times3}$

$= \frac{16}{81}$

Q14. Express each of the following rational numbers in power notation

(i) $\frac{49}{64}$

(ii) $-\frac{64}{125}$

(iii) $-\frac{1}{216}$

Sol:

(i) $\frac{49}{64} = (\frac{7}{8})^2$

Because $7^2 = 49$ and $8^2 = 64$

(ii) $-\frac{64}{125} = (-\frac{4}{5})^3$

Because $4^3 = 64$ and $5^3 = 125$

(iii) $-\frac{1}{216} = (-\frac{1}{6})^3$

Because $1^3 = 1$ and $6^3 = 216$

Q15. Find the value of the following

(i) $(\frac{-1}{2})^2 \times 2^3 \times (\frac{3}{4})^2$

(ii) $(\frac{-3}{5})^4 \times (\frac{4}{9})^4 \times (\frac{-15}{18})^2$

Sol:

(i) $(\frac{-1}{2})^2 \times 2^3 \times (\frac{3}{4})^2 = \frac{1}{2} \times 8 \times \frac{9}{16}$

$= \frac{9}{8}$

(ii) $(\frac{-3}{5})^4 \times (\frac{4}{9})^4 \times (\frac{-15}{18})^2 = \frac{81}{625} \times \frac{256}{6561} \times \frac{225}{324} = \frac{64}{18225}$

Q16. If a= 2 and b = 3, the find the values of each of the followimg

(i) $(a+b)^a$

(ii) $(ab)^b$

(iii) $(\frac{b}{a})^b$

(iv) $(\frac{a}{b} + \frac{b}{a})^a$

Sol:

(i) $(a+b)^a = (2+3)^2$

$= (5)^2$

$= 25$

(ii) $(ab)^b = (2 \times 3)^3$

$= (6)^3$

$= 216$

(iii) $(\frac{b}{a})^b = (\frac{3}{2})^3$

$= \frac{27}{8}$

(iv) $(\frac{a}{b} + \frac{b}{a})^a = (\frac{2}{3} + \frac{3}{2})^2$

$= \frac{169}{36}$

Exercise 6.2

Q1. Using laws of exponents, simplify and write the answer in exponential form

(i) $2^3 \times 2^4 \times 2^5$

(ii) $5^{12} \div 5^3$

(iii) $(7^2)^3$

(iv) $(3^2)^5 \div 3^4$

(v) $3^7 \times 2^7$

(vi) $(5^{21} \div 5^{13}) \times 5^7$

Sol:

(i) $2^3 \times 2^4 \times 2^5$

We know that, $a^m + a^n + a^p = a^{m+n+p}$

So, $2^3 \times 2^4 \times 2^5 = 2^{3+4+5}$

$= 2^{12}$

(ii) $5^{12} \div 5^3$

We know that, $a^m \div a^n = a^{m-n}$

So, $5^{12} \div 5^3 = 5^{12-3}$

$= 5^9$

(iii) $(7^2)^3$

We know that, $(a^m)^n = a^{mn}$

So, $(7^2)^3 = 7^{(2)(3)}$

$= 7^6$

(iv) $(3^2)^5 \div 3^4$

We know that, $a^m \div a^n = a^{m-n}$ and $(a^m)^n = a^{mn}$

So, $(3^2)^5 \div 3^4 = 3^{10} \div 3^4$

$= 3^{10-4}$

$= 3^6$

(v) $3^7 \times 2^7$

We know that, $(a^m \times b^m) = (a \times b)^m$

So, $3^7 \times 2^7 = (3 \times 2)^7$

$= 6^7$

(vi) $(5^{21} \div 5^{13}) \times 5^7$

We know that, $a^m \div a^n = a^{m-n}$ and $(a^m \times a^n) = (a)^{m+n}$

So, $(5^{21} \div 5^{13}) \times 5^7 = (5^{21-13}) \times 5^7$

$= (5^8) \times 5^7$

$= 5^{8+7}$

$= 5^{15}$

Q2. Simplify and express each of the following in exponential form

(i) $((2^3)^4 \times 2^8) \div 2^{12}$

(ii) $(8^2 \times 8^4) \div 8^3$

(iii) $(\frac{5^7}{5^2}) \times 5^3$

(iv) $(\frac{5^4 \times x^{10} y^5}{5^4 \times x^7 y^4})$

Sol:

(i) $((2^3)^4 \times 2^8) \div 2^{12}$

=> $(2^{12} \times 2^8) \div 2^{12}$

=> $2^{12+8} \div 2^{12}$

=> $2^{20} \div 2^{12}$

=> 2^{20-12}

=> 2^8

(ii) $(8^2 \times 8^4) \div 8^3$

=> $8^{2+4} \div 8^3$

=> $8^6 \div 8^3$

=> 8^{6-3}

=> 8^3 (or)

=> 2^8

(iii) $(\frac{5^7}{5^2}) \times 5^3$

=> $5^{7-2} \times 5^3$

=> $5^5 \times 5^3$

=> 5^{5+3}

=> 5^8

(iv) $(\frac{5^4 \times x^{10} y^5}{5^4 \times x^7 y^4})$

=> $5^{4-4} \times x^{10-7} \times y^{5-4}$

=> $5^0 \times x^3 \times y^1$

=> $1 \times x^3 \times y$

=> $x^3 y$

Q3. Simplify and express each of the following in exponential form

(i) $((3^2)^3 \times 2^6) \times 5^6$

(ii) $(\frac{x}{y})^{12} \times y^{24} \times (2^3)^4$

(iii) $(\frac{5}{2})^6 \times (\frac{5}{2})^2$

(iv) $(\frac{2}{3})^5 \times (\frac{3}{5})^5$

Sol:

(i) $((3^2)^3 \times 2^6) \times 5^6$

=> $(3^6 \times 2^6) \times 5^6$

=> $6^6 \times 5^6$

=> 30^6

(ii) $(\frac{x}{y})^{12} \times y^{24} \times (2^3)^4$

=> $(\frac{x^{12}}{y^{12}}) \times y^{24} \times 2^{12}$

=> $x^{12} \times y^{24-12} \times 2^{12}$

=> $x^{12} \times y^{12} \times 2^{12}$

=> $(2xy)^{12}$

(iii) $(\frac{5}{2})^6 \times (\frac{5}{2})^2$

We know that, $(a^m \times a^n) = (a)^{m+n}$

Here a = $\frac{5}{2}$

=> $(\frac{5}{2})^{6+2}$

=> $(\frac{5}{2})^8$

(iv) $(\frac{2}{3})^5 \times (\frac{3}{5})^5$

We know that, $(a^m \times b^m) = (a \times b)^m$

=> $(\frac{2}{3} \times \frac{3}{5})^5$

=> $(\frac{2}{5})^5$

Q4. Write 9 ×9 ×9 ×9 ×9 in exponential form with base 3

Sol:

9 ×9 ×9 ×9 ×9 = $(9)^5$ = $(3^2)^5$

= 3^{10}

Q5. Simplify and write each of the following in exponential form

(i) $(25)^3 \div 5^3$

(ii) $(81)^5 \div (3^2)^5$

(iii) $\frac{9^8 \times (x^2)^5}{(27)^4 \times (x^3)^2}$

(iv) $\frac{3^2 \times 7^8 \times 13^6}{(21)^2 \times (91)^3}$

Sol:

(i) $(25)^3 \div 5^3$

=> $(5^2)^3 \div 5^3$

=> $5^6 \div 5^3$

=> 5^{6-3}

=> 5^3

(ii) $(81)^5 \div (3^2)^5$

=> $(3^4)^5 \div (3^2)^5$

=> $3^{20} \div 3^{10}$

=> 3^{20-10}

=> 3^{10}

(iii) $\frac{9^8 \times (x^2)^5}{(27)^4 \times (x^3)^2}$

=> $\frac{(3^2)^8 \times (x^2)^5}{(3^3)^4 \times (x^3)^2}$

=> $\frac{3^{16} \times x^{10}}{3^{12} \times x^6}$

=> $3^{16-12} \times x^{10-6}$

=> $3^4 \times x^4$

=> $(3x)^4$

(iv) $\frac{3^2 \times 7^8 \times 13^6}{(21)^2 \times (91)^3}$

=> $\frac{3^2 \times 7^2 7^6 \times (13)^6}{(21)^2 \times (13 \times 7)^3}$

=> $\frac{(21)^2 \times 7^6 \times (13)^6}{(21)^2 \times (13)^3 \times (7)^3}$

=> $\frac{7^6 \times (13)^6}{(13)^3 \times (7)^3}$

=> $\frac{91^6}{91^3}$

=> $(91)^{6-3}$

=> $(91)^3$

Q6. Simplify

(i) $(3^5)^{11} \times (3^{15})^4 - (3^5)^{18} \times (3^5)^5$

(ii) $\frac{16 \times (2)^{n+1} - 4 \times 2^n}{16 \times (2)^{n+2} - 2 \times (2)^{n+2}}$

(iii) $\frac{10 \times (5)^{n+1} + 25 \times 5^n}{3 \times (5)^{n+2} + 10 \times (5)^{n+1}}$

(iv) $\frac{(16)^7 \times (25)^5 \times (81)^3}{(15)^7 \times (24)^5 \times (80)^3}$

Sol:

(i) $(3^5)^{11} \times (3^{15})^4 - (3^5)^{18} \times (3^5)^5$

=> $3^{55} \times 3^{60} - 3^{90} \times 3^{25}$

=> $3^{(55+60)} - 3^{(90+25)}$

=> $3^{(115)} - 3^{(115)}$

=> 0

(ii) $\frac{16 \times (2)^{n+1} - 4 \times 2^n}{16 \times (2)^{n+2} - 2 \times (2)^{n+2}}$

=> $\frac{2^4 \times 2^{(n+1)} - 2^2 \times 2^n}{2^4 \times 2^{(n+2)} - 2^{n+1} \times 2^2}$

=> $\frac{2^2 \times 2^{(n+3-2n)}}{2^2 \times 2^{(n+4-2n+1)}}$

=> $\frac{2^n \times 2^3 - 2^n}{2^n \times 2^4 - 2^n \times 2}$

=> $\frac{2^n(2^3 - 1)}{2^n(2^4 - 1)}$

=> $\frac{8 - 1}{16 - 2}$

=> $\frac{7}{14}$

=> $\frac{1}{2}$

(iii) $\frac{10\times(5)^{n+1}+25\times5^{n}}{3\times(5)^{n+2}+10\times(5)^{n+1}}$

$=> \frac{10\times5^{(n+1)}+5^{2}\times5^{n}}{3\times5^{(n+2)}+(2\times5)\times5^{(n+1)}}$

$=> \frac{10\times5^{(n+1)}+5\times5^{(n+1)}}{3\times5^{(n+2)}+(2\times5)\times5^{(n+1)}}$

$=> \frac{5^{(n+1)}(10+5)}{5^{(n+1)}(10+15)}$

$=> \frac{15}{25}$

$=> \frac{3}{5}$

(iv) $\frac{(16)^{7}\times(25)^{5}\times(81)^{3}}{(15)^{7}\times(24)^{5}\times(80)^{3}}$

$=> \frac{(16)^{7}\times(5^{2})^{5}\times(3^{4})^{3}}{(3\times5)^{7}\times(3\times8)^{5}\times(16\times5)^{3}}$

$=> \frac{(16)^{7}\times(5^{2})^{5}\times(3^{4})^{3}}{3^{7}\times5^{7}\times3^{5}\times8^{5}\times16^{3}\times5^{3}}$

$=> \frac{(16)^{7}\times(5^{2})^{5}\times(3^{4})^{3}}{3^{12}\times5^{10}\times8^{5}\times16^{3}}$

$=> \frac{(16)^{7}}{8^{5}\times16^{3}}$

$=> \frac{(16)^{7-3}}{8^{5}}$

$=> \frac{(16)^{4}}{8^{5}}$

$=> \frac{(2\times8)^{4}}{8^{5}}$

$=> \frac{2^{4}\times8^{4}}{8^{5}}$

$=> \frac{2^{4}}{8}$

$=> \frac{16}{8}$

$=> 2$

Q7. Find the values of n in each of the following

(i) $5^{2n} \times 5^3 = 5^{11}$

(ii) $9 \times 3^n = 3^7$

(iii) $8 \times 2^{n+2} = 32$

(iv) $7^{2n+1} \div 49 = 7^3$

(v) $(\frac{3}{2})^4 \times (\frac{3}{2})^5 = (\frac{3}{2})^{2n+1}$

(vi) $(\frac{2}{3})^{10} \times ((\frac{3}{2})^2)^5 = (\frac{2}{3})^{2n-2}$

Sol:

(i) $5^{2n} \times 5^3 = 5^{11}$

=> $5^{2n+3} = 5^{11}$

Equating the powers

=> 2n + 3 = 11

=> 2n = 11- 3

=> 2n = 8

=> n = 4

(ii) $9 \times 3^n = 3^7$

=> $3^2 \times 3^n = 3^7$

=> $3^{2+n} = 3^7$

Equating the powers

=> 2 + n = 7

=> n = 7 – 2

=> n = 5

(iii) $8 \times 2^{n+2} = 32$

=> $2^3 \times 2^{n+2} = 2^5$

=> $2^{3+n+2} = 2^5$

=> $2^{n+5} = 2^5$

Equating the powers

=> n + 5 = 5

=> n = 0

(iv) $7^{2n+1} \div 49 = 7^3$

=> $7^{2n+1} \div 7^2 = 7^3$

=> $7^{2n+1-2} = 7^3$

=> $7^{2n-1} = 7^3$

Equating the powers

=> 2n − 1 = 3

=> 2n = 4

=> n = 2

(v) $(\frac{3}{2})^4 \times (\frac{3}{2})^5 = (\frac{3}{2})^{2n+1}$

=> $(\frac{3}{2})^{(4+5)} = (\frac{3}{2})^{(2n+1)}$

Equating the powers

=> 4 + 5 = 2n + 1

=> 2n + 1 = 9

=> 2n = 8

=> n = 4

(vi) $(\frac{2}{3})^{10} \times ((\frac{3}{2})^2)^5 = (\frac{2}{3})^{2n-2}$

=> $(\frac{2}{3})^{10} \times (\frac{3}{2})^{10} = (\frac{2}{3})^{2n-2}$

=> $\frac{2^{10}}{3^{10}} \times \frac{3^{10}}{2^{10}} = (\frac{2}{3})^{2n-2}$

=> $1 = \frac{2^{(2n-2)}}{3^{(2n-2)}}$

=> 3(2n − 2) =2(2n − 2)

=> 6n − 6 = 4n − 4

=> 6n − 4n = 6 − 4

=> 2n = 2

=> n = 1

Q8. If $\frac{9^n \times 3^2 \times 3^n - (27)^n}{(3^3)^5 \times 2^3} = \frac{1}{27}$, find the value of n

Sol:

$$\frac{9^n \times 3^2 \times 3^n - (27)^n}{(3^3)^5 \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{(3^2)^n \times 3^3 \times 3^n - (3^3)^n}{3^{15} \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{3^{(2n+2+n)} - 3^{3n}}{3^{15} \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{3^{(3n+2)} - 3^{3n}}{3^{15} \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{3^{3n} \times 3^2 - 3^{3n}}{3^{15} \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{3^{3n}(3^2 - 1)}{3^{15} \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{3^{3n}(9 - 1)}{3^{15} \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{3^{3n}(8)}{3^{15} \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{3^{3n} \times 2^3}{3^{15} \times 2^3} = \frac{1}{27}$$

$$\Rightarrow \frac{3^{3n}}{3^{15}} = \frac{1}{27}$$

$$\Rightarrow 3^{3n-15} = \frac{1}{27}$$

On equating the coefficient

$3n - 15 = -3$

$3n = -3 + 15$

$3n = 12$

$n = 4$

Exercise 6.3

Q1 Express the following numbers in the standard form

(i) 3908.78

(ii) 5,00,00,000

(iii) 3,18,65,00,000

(iv) 846×10^7

(v) 723×10^9

Sol:

(i) 3908.78 = 3.90878×10^3

Since, the decimal point is moved three places to the left

(ii) 5,00,00,000 = 5,00,00,000.00

= 5×10^7

Since, the decimal point is moved seven places to the left

(iii) 3,18,65,00,000 = 3,18,65,00,000.00

= 3.1865×10^9

Since, the decimal point is moved nine places to the left

(iv) $846 \times 10^7 = 8.46 \times 10^2 \times 10^7$

= 8.46×10^9

Since, the decimal point is moved two places to the left

(v) $723 \times 10^9 = 7.23 \times 10^2 \times 10^9$

= 7.23×10^{11}

Since, the decimal point is moved two places to the left

Q2. Write the following numbers in the usual form

(i) 4.83×10^7

(ii) 3.21×10^5

(iii) 3.5×10^3

Sol:

(i) $4.83 \times 10^7 = 483 \times 10^{(7-2)}$

$= 483 \times 10^5$

= 4,83,00,000

Since, the decimal point is moved two places to the right

(ii) $3.21 \times 10^5 = 321 \times 10^{(5-2)}$

$= 321 \times 10^3$

= 3,21,000

Since, the decimal point is moved two places to the right

(ii) $3.5 \times 10^3 = 35 \times 10^{(3-1)}$

$= 35 \times 10^2$

= 3,500

Since, the decimal point is moved one place to the right

Q3. Express the numbers appearing in the following statements in the standard form

(i) The distance between the earth and the moon is 384,000,000 metres.

(ii) Diameter of the earth is 1,27,56,000 metres.

(iii) Diameter of the sun is 1,400,000,000 metres.

(iv) The universe is estimated to be about 12,000,000,000 years old.

Sol:

(i) The distance between the earth and the moon is 3.84×10^8 metres.

Since, the decimal point is moved eight places to the left

(ii) Diameter of the earth is 1.2756×10^7 metres.

Since, the decimal point is moved seven places to the left

(ii) Diameter of the sun is 1.4×10^9 metres.

Since, the decimal point is moved nine places to the left

(iv) The universe is estimated to be about 1.2×10^{10} years old.

Since, the decimal point is moved ten places to the left