Exponents Ex 6.2 Q1

Answer :

We have

(i) $2^3 \times 2^4 \times 2^5 = 2^{(3+4+5)} = 2^{12}$ [since $a^m + a^n + a^p = a^{(m+n+p)}$]

(ii) $5^{12} \div 5^3 = \frac{5^{12}}{5^3} = 5^{12-3} = 5^9$ [since $a^m \div a^n = a^{m-n}$]

(iii) $(7^2)^3 = 7^6$ [since $(a^m)^n = a^{mn}$]

(iv) $(3^2)^5 \div 3^4 = 3^{10} \div 3^4$ [since $(a^m)^n = a^{mn}$]

$= 3^{(10-4)} = 3^6$ [since $a^m \div a^n = a^{m-n}$]

(v) $3^7 \times 2^7 = (3 \times 2)^7 = 6^7$ [since $a^m \times b^m = (a \times b)^m$]

(vi) $(5^{21} \div 5^{13}) \times 5^7 = 5^{(21-13)} \times 5^7$ [since $a^m \div a^n = a^{m-n}$]

$= 5^8 \times 5^7$ [since $a^m \times b^n = a^{(m+n)}$]

$= 5^{(8+7)}$

$= 5^{15}$

Exponents Ex 6.2 Q2

Answer :

We have

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

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

$= 8^6 \div 8^3$

$= 8^{(6-3)} = 8^3 = (2^3)^3 = 2^9$

(iii) $\left(\frac{5^7}{5^2}\right) \times 5^3 = 5^{(7-2)} \times 5^3$

$= 5^5 \times 5^3$

$= 5^{(5+3)} = 5^8$

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

$= 5^0 \times x^3 \times y$ [since $5^0 = 1$]

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

Exponents Ex 6.2 Q3

Answer :

We have

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

$= \{3^6 \times 2^6\} \times 5^6$ [since $(a^m)^n = a^{mn}$]

$= 6^6 \times 5^6$ [since $a^m \times b^m = (a \times b)^m$]

$= 30^6$

(ii)

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

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

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

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

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

$$= (2xy)^{12} \text{ [since } a^m \times b^m \times c^m = (a \times b \times c)^m]$$

(iii)

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

$$= \left(\frac{5}{2}\right)^8 \left[\text{since } a^m \times a^n = a^{m+n}\right]$$

(iv)

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

$$= \left(\frac{2}{3} \times \frac{3}{5}\right)^5 \left[\text{since } a^m \times b^m = \left(a \times b\right)^m\right]$$

$$= \left(\frac{2}{5}\right)^5$$

Exponents Ex 6.2 Q4

Answer :

We have

$9 \times 9 \times 9 \times 9 \times 9 = (9)^5 = (3^2)^5 = 3^{10}$

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