# EXPONENTS AND POWERS

## EXPONENTS

## EXERCISE

**Q.1** Evaluate.

(i) $3^{-2}$ (ii) $(-4)^{-2}$ (iii) $\left(\frac{1}{2}\right)^{-5}$

**Q.2** Simplify and express the result in power notation with positive exponent.

(i) $(-4)^5 \div (-4)^8$ (ii) $\left(\frac{1}{2^3}\right)^2$

(iii) $(-3)^4 \times \left(\frac{5}{3}\right)^4$ (iv) $(3^{-7} \div 3^{-10}) \times 3^{-5}$

(v) $2^{-3} \times (-7)^{-3}$

**Q.3** Find the value of.

(i) $(3^0 + 4^{-1}) \times 2^2$ (ii) $(2^{-1} \times 4^{-1}) \div 2^{-2}$

(iii) $\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$ (iv) $(3^{-1} + 4^{-1} + 5^{-1})^0$

(v) $\left\{\left(\frac{-2}{3}\right)^{-2}\right\}^2$

**Q.4** Evaluate

(i) $\frac{8^{-1} \times 5^3}{2^{-4}}$ (ii) $(5^{-1} \times 2^{-1}) \times 6^{-1}$

**Q.5** Express each of the following as a rational number of the form $\frac{p}{q}$:

(i) $\left(\frac{3}{8}\right)^{-2} \times \left(\frac{4}{5}\right)^{-3}$ (ii) $\left(\frac{-2}{7}\right)^{-4} \times \left(\frac{-7}{5}\right)^{2}$

**Q.6** Express each of the following as power of a rational number with positive exponent :

(i) $\left(\frac{1}{4}\right)^{-3}$

(ii) $5^{-3} \times 5^{-6}$

(iii) $\left(\frac{-1}{4}\right)^{-5} \times \left(\frac{-1}{4}\right)^{-7}$

**Q.7** Simplify:

(i) $\left(2^{-1} \div 5^{-1}\right)^{2} \times \left(\frac{-5}{8}\right)^{-1}$ (ii) $\left(6^{-1} - 8^{-1}\right)^{-1} + (2^{-1} - 3^{-1})^{-1}$

(iii) $\left(5^{-1} \times 3^{-1}\right)^{-1} \div 6^{-1}$ (iv) $\left(4^{-1} + 8^{-1}\right) \div \left(\frac{2}{3}\right)^{-1}$

**Q.8** Simplify and write the answer in the exponetial form:

(i) $(2^5 \div 2^8)^5 \times 2^{-5}$

(ii) $(-4)^3 \times (5)^{-3} \times (-5)^{-3}$

(iii) $\frac{1}{8} \times 3^{-3}$

## ANSWER KEY

**1.** (i) $\frac{1}{9}$ (ii) $\frac{1}{16}$ (iii) 32

**2.** (i) $\frac{1}{(-4)^3}$ (ii) $\frac{1}{2^6}$ (iii) $(5)^4$

(iv) $\frac{1}{(3)^2}$ (v) $\frac{1}{(-14)^3}$

**3.** (i) 5 (ii) $\frac{1}{2}$ (iii) 29

(iv) 1 (v) $\frac{81}{16}$

**4.** (i) 250 (ii) $\frac{1}{60}$

**5.** (i) $\frac{125}{9}$ (ii) $\frac{117649}{400}$

**6.** (i) $4^3$ (ii) $\left(\frac{1}{5}\right)^9$ (iii) $4^{12}$

**7.** (i) – 10 (ii) 30

(iii) 90 (iv) $\frac{1}{4}$

**8.** (i) $2^{-20}$ (ii) $10^{-6}$ (iii) $6^{-3}$