Q1. **Express each of the following in exponential notation:**

a. $5 \times 5 \times 5 \times 5$ = _____

b. $2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3$ = _____

c. $7 \times 11 \times 7 \times 11 \times 7 \times 11 \times 7$ = _____

d. $123 \times 123 \times 123$ = _____

Q2. **Write the exponent and the base of each of the following exponential notations:**

Exponential expression	Base	Exponent
$\left(\dfrac{3}{5}\right)^4$	_____	_____
7^3	_____	_____
$\left(\dfrac{-2}{7}\right)^5$	_____	_____

Q3. **Find the value of each of the following:**

a. $\left(-\dfrac{3}{4}\right)^{-2}$ = _____

b. $\left(-\dfrac{2}{3}\right)^{0}$ = _____

c. $(2^{-1})^{-3}$ = _____

d. $(-2^{-1})^{-3}$ = _____

Q4. Simplify the following:

a. $(3^3 + 5^3) \div \dfrac{1}{3^2} \times 23^0$

Answer: _____

b. $\left(\dfrac{1}{3}\right)^2 + \left(\dfrac{2}{9}\right)^{-1} \times \left(\dfrac{2}{3}\right)^4$

Answer: _____

Q5. Express each of the following in exponential form of prime factors:

a. $\dfrac{32}{243} = \dfrac{\Box}{\Box}$

b. $\dfrac{49}{1331} = \dfrac{\Box}{\Box}$

c. $\dfrac{-125}{196} = \dfrac{\Box}{\Box}$

Q6. Compare and put the correct sign <, > or =.

a. $(-1)^{211}$ _____ $(-1)^{22}$

b. $(0.1)^2$ _____ $(0.1)^5$

c. $(1.1)^{100}$ _____ $(-1.1)^{100}$

d. $(3)^4$ _____ $(4)^3$

Q7. Rajan can climb $(-2)^4$ stairs in 1 minute. Srishti can climb $(-4)^2$ stairs in a minute. How many stairs will each of them climb in 60 seconds?

Rajan: _____ stairs

Srishti: _____ stairs

Q8. If $x = 2$, $y = 3$ and $z = -1$, calculate the value of:

a. $\left(\dfrac{y^2}{z^2} - \dfrac{x^2}{z}\right)^2 = $ ____

b. $x^y + y^x + y^z = $ ____

c. $y^z(x^y - x^x) = $ ____

Q9. Find the value of x if :

a. $\left(\dfrac{2}{7}\right)^5 \div \left(\dfrac{2}{7}\right)^{-3} = \left(\dfrac{2}{7}\right)^{2x}$

$x = $ _____

b. $\left(\dfrac{3}{8}\right)^{-3} \times \left(\dfrac{3}{8}\right)^x = \left(\dfrac{3}{8}\right)^{-4}$

$x = $ _____

Q10. Simplify, using laws of exponents, and express the solution in positive exponents only:

a. $\dfrac{2^4 \times (-3^5)}{2^{-2} \times (-3)^2}$ $= $ _____

b. $\dfrac{x^2 \times y^{-2} \times z^{-3}}{x \times y^3 z^{-5}}$ $= $ _____

Answers

1. a. 5^4; b. $2^3 \times 3^4$; c. $7^4 \times 11^3$; d. 123^3

2.

Exponential expression	Base	Exponent
$\left(\dfrac{3}{5}\right)^4$	$\dfrac{3}{5}$	4
7^3	7	3
$\left(\dfrac{-2}{7}\right)^5$	$\dfrac{-2}{7}$	5

3. a. $\dfrac{16}{9}$; b. 1; c. 8; d. –8

4. a. 1368; b. 1

5. a. $\dfrac{2^5}{3^5}$; b. $\dfrac{7^2}{11^3}$; c. $\dfrac{(-5)^3}{2^2 \times 7^2}$

6. a. <; b. >; c. =; d. >

7. Rajan: 16; Srishti: 16

8. a. 169; b. $17\dfrac{1}{3}$; c. $1\dfrac{1}{3}$

9. a. 4; b. –1

10. a. $2^6 \times (-3)^3$; b. $\dfrac{xz^2}{y^5}$