3 EXPONENTS

Q1. Express each of the following in exponential notation and fill in the table given below:

Expression	Exponential Notation
$\frac{2}{3} \times \frac{2}{3} \times \frac{2}{3}$	_____
$4 \times 4 \times 4 \times 4 \times 4$	_____
$5 \times 5 \times 5 \times 5$	_____
$0.23 \times 0.23 \times 0.23 \times 0.23 \times 0.23$	_____

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

Exponential expression	Base	Exponent
$\left(-\frac{1}{16}\right)^3$	_____	_____
$(-8)^2$	_____	_____
$\left(\frac{3}{5}\right)^5$	_____	_____

Q3. Find the value of each of the following:

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

b. $\left(-\frac{23}{41}\right)^{0}$ = _____

c. $(2^0)^{-4}$ = _____

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

Q4. Simplify the following:

a. $(5^0 + 2^3 + 3^2) \div \left(\frac{2}{5}\right)^2 \times \frac{6^2}{45}$

Answer: _____

b. $4^{-2} \div (-4)^{-3} \times (-5)^3$

Answer: _____

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

a. $\frac{81}{361} = \frac{\square}{\square}$

b. $\frac{-125}{343} = \frac{\square}{\square}$

c. $\frac{400}{441} = \frac{\square}{\square}$

Q6. Arrange the following in ascending order:

a. $(-1)^{22}, (-1)^{211}, (-0.1)^2, (-1.1)^2$

Answer: _____

b. $(0.1)^3, (-1.1)^2, (0.01)^2, (-1.1)^3$

Answer: _____

Q7. Rashmi bought 2^3 bananas for ₹ 20, and Suman bought 3^2 bananas for ₹ 20. Who bought more number of bananas?

Answer: _____

Q8. If $a = -1$, $b = 2$ and $c = 3$, find the value of the following:

a. $\left(\frac{a}{b}\right)^c + \left(\frac{b}{c}\right)^a$ = _____

b. $(a + b)^{c-1} + (a - b)^{c+1}$ = _____

Q9. Find the value of x if :

a. $\left(\left(\frac{1}{4}\right)^5\right)^2 \div \left(\frac{1}{4}\right)^3 = \left(\frac{1}{4}\right)^{x+2}$

$x =$ _____

b. $\left(-\frac{3}{4}\right)^{-1} \times \left(-\frac{3}{4}\right)^{2x} = \left(-\frac{3}{4}\right)^{-5}$

$x =$ _____

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

a. $\frac{a^5 \times b^{-3} \times c}{a^{-3} \times c^3 b^2}$ = _____

b. $\frac{5^{-5} \times 3^2 \times 2^6}{2^4 5^{-2} \times 3^{-2}}$ = _____

Answers

1.

Expression	Exponential Notation
$\frac{2}{3} \times \frac{2}{3} \times \frac{2}{3}$	$\left(\frac{2}{3}\right)^3$
$4 \times 4 \times 4 \times 4 \times 4$	4^5
$5 \times 5 \times 5 \times 5$	5^4
$0.23 \times 0.23 \times 0.23 \times 0.23 \times 0.23$	$(0.23)^5$

2.

Exponential expression	Base	Exponent
$\left(-\frac{1}{16}\right)^3$	$-\frac{1}{16}$	3
$(-8)^2$	-8	2
$\left(\frac{3}{5}\right)^5$	$\frac{3}{5}$	5

3. a. $-3\frac{3}{8}$; b. 1; c. 1; 9

4. a. 90; b. 500

5. a. $\frac{3^4}{19^2}$; b. $\frac{(-5)^3}{7^3}$; c. $\frac{5^2 \times 2^4}{7^2 \times 3^2}$

6. a. $(-1)^{211} < (-0.1)^2 < (-1)^{22} < (-1.1)^2$;

b. $(-1.1)^3 < (0.01)^2 < (0.1)^3 < (-1.1)^2$

7. Suman

8. a. $1\frac{3}{8}$; b. 82

9. a. 5; b. –2

10. a. $\frac{a^8}{b^5c^2}$; b. $\frac{3^4 \times 2^2}{5^3}$