CHAPTER P3

Integer Exponents and Scientific Notation

Multiple-Choice Old Exam Questions

25 questions • 3 topics • options A–E • two questions per page

Topic 1 | Scientific Notation

Computing with numbers in scientific notation, converting to decimal form and finding unknown exponents • Questions 1–12

Q 1

The expression $\frac{(0.00002)(6.9\times10^{8})}{23}$ in scientific notation is equal to

A) 6×10^2

B) 6×10

C) 3×10^2

D) 2×10^2

E) 6×10^{-2}

Q 2

If $\frac{(12800)(2\times10^{6})}{0.0064} = m \times 10^n$, then $m + n =$

A) 16

B) 13

C) 15

D) 14

E) 12

Q
3

The decimal notation of the expression $\frac{(1.6\times10^{3})(5.1\times10^{-5})}{4.8\times10^{2}}$ is

A) 0.00017

B) 0.000017

C) 0.0014

D) 140000

E) 0.0017

Q
4

Let $A = 0.0018$, $B = 400000$, and $C = 0.0002$. If $\frac{AB}{C}$ is written in scientific notation, then $\frac{AB}{C} =$

A) 3.6×10^{6}

B) 36×10^{5}

C) 3600000

D) 1.8×10^{6}

E) 18×10^{5}

Q
5

The number $\frac{(6.9\times10^{29})(7.5\times10^{-14})}{0.023\times10^{16}}$ written in scientific notation is given by

A) 2.25×10^{2}

B) 22.25×10^{6}

C) 2.25×10^{-2}

D) 0.225×10^{4}

E) 2.25×10^{-5}

Q
6

If $\frac{(210000)(4\times10^{-12})}{0.000028} = m \times 10^{n}$ (in scientific notation), then $m + n =$

A) -2

B) 1

C) 3

D) 5

E) -1

Q
7

Let $A = 0.0000021$, $B = 200000$, and $C = 8.4 \times 10^{-n}$. If $\frac{AB}{C} = 5 \times 10^{3}$, then $n =$

A) 5

B) 4

C) 6

D) 3

E) 7

Q
8

If $\frac{0.7\times10^{-5}}{(-1.4\times10^{-6})(-1000)} = A \times 10^{B}$ is written in scientific notation, then $A + B =$

A) 2

B) -2

C) 8

D) 7

E) 3

Q
9

In scientific notation, the number $\frac{(16000)(4.5\times10^{-4})}{0.048} =$

A) 15×10^{2}

B) 1.5×10^{3}

C) 1.5×10^{2}

D) 1.5×10^{-2}

E) 15×10^{-2}

Q
10

$$(1.3 \times 10^{-13}) + (12 \times 10^{-14}) =$$

A) 2.5×10^{-13}

B) 25×10^{-13}

C) 3.5×10^{-13}

D) 13.3×10^{-27}

E) 2.5×10^{-27}

Q
11

Let $a = 93{,}000{,}000$ miles be the distance from the earth to the sun, and $b = 1.86 \times 10^5$ miles per second be the speed of light. If $c = \frac{a}{b}$ is the time, in seconds, for a light ray from the sun to reach the earth, then $c =$

A) 5×10^2

B) $\frac{1}{2} \times 10^2$

C) $\frac{1}{2} \times 10^{-2}$

D) $\frac{1}{2} \times 10^{-1}$

E) 5×10^{-1}

Q
12

If $M = 0.00000003$ and $N = 2700000000000$, then $\frac{\sqrt{MN}}{9 \times 10^0} =$

A) $100\sqrt{10}$

B) $\sqrt{10}$

C) 100

D) $10\sqrt{10}$

E) 10

Topic 2 | Evaluating Expressions with Integer Exponents

Evaluating numerical expressions and statements involving zero and negative exponents • Questions 13–20

Q **13**

If $M = -2^{-2} \cdot (-4)^0$ and $N = -\frac{2}{5} \div 1.6$, then the distance between M and N is equal to

A) 0

B) $\frac{1}{4}$

C) $\frac{1}{2}$

D) $-\frac{84}{25}$

E) $-\frac{1}{2}$

Q **14**

The number $(-2^{-2} + 3^{-1})^{-1}$ is equal to

A) 12

B) -12

C) 5

D) -5

E) $\frac{12}{7}$

Q
15

If $2^{x-1} = y$, then $2^{3x-2} =$

A) $2y^3$

B) $4y^3$

C) $y^3/8$

D) $y^3/4$

E) $y^3/2$

Q
16

If $p \neq 0$, then which one of the following statements is FALSE?

A) $-3p^0 = -1$

B) $3p^0 = 3$

C) $(-3p)^0 = 1$

D) $-(3p^0) = -3$

E) $-(3p)^0 = -1$

Q
17

If $p = 3$ and $q = 2$, then the value of $\frac{p^{-1}+q^{-1}}{1-(pq)^{-1}} =$

A) 1

B) $\frac{5}{7}$

C) $\frac{25}{36}$

D) $-\frac{1}{6}$

E) -1

Q
18

$$(1.1)^2 - 2(1.1)(0.9) + (0.9)^2 =$$

A) 4×10^{-2}

B) 2×10^{-4}

C) 4×10^{-1}

D) 2×10^{-2}

E) 2×10^{-1}

Q
19

If $a = 2$ and $b = -3$, then $(85)^{3a}\left(\frac{1}{a^{-2}} - \frac{3}{b^{-3}}\right)^{3b} =$

A) 85^{-3}

B) 0

C) $-\frac{1}{77}$

D) $-\frac{1}{85}$

E) 85^{12}

Q
20

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

A) $-\frac{1}{2}$

B) $\frac{3}{4}$

C) -4

D) $\frac{3}{2}$

E) $\frac{1}{7}$

Topic 3 | Simplifying Expressions with Integer Exponents

Simplifying algebraic expressions with negative exponents and finding the exponents or coefficients • Questions 21–25

Q **21**

If $x \neq 0, y \neq 0$, and $\frac{3(x^4y^{-1})^{-1}(-2x^{-2})^{-2}}{(2^{-1}y^{-2})^2} = kx^a y^b$, then $k + a + b =$

A) 8

B) $\frac{16}{3}$

C) -43

D) 0

E) $-\frac{3}{16}$

Q **22**

If $\frac{(3x^{-2}y^{-3})^{-2}}{27xy} = \frac{x^m y^n}{3^k}$, then $n + m + k =$

A) 13

B) 6

C) 3

D) 5

E) 11

Q
23

If $\frac{x^{3n}y^{2n}}{x^{-2n}y^{3n+1}} = x^{An+B}y^{Cn+D}$, then $A + B + D =$

A) 4

B) 2

C) -4

D) -3

E) 7

Q
24

$$\frac{(-2x^3)^2(xy)^{-3}}{(3x^{-5}y^2)^{-2}} =$$

A) $\frac{36y}{x^7}$

B) $\frac{36x}{y^7}$

C) $\frac{4y}{9x}$

D) $-\frac{9y}{4x}$

E) $36xy$

Q
25

$$(x^2 - 1)^{-1} + (x^{-2} - 1)^{-1} =$$

A) 1

B) $\frac{2}{x^2-1}$

C) $\frac{x^2-1}{x^2+1}$

D) $\frac{x^2+1}{x^2-1}$

E) -1

Answer Key

"Original" shows the question number in the source worksheet.

Q	Original	Ans.	Value
1	1	**A**	6×10^2
2	2	**A**	16
3	5	**A**	0.00017
4	6	**A**	3.6×10^6
5	9	**A**	2.25×10^2
6	15	**B**	1
7	16	**A**	5
8	17	**A**	2
9	18	**C**	1.5×10^2
10	19	**A**	2.5×10^{-13}
11	22	**A**	5×10^2
12	25	**D**	$10\sqrt{10}$
13	3	**A**	0
14	8	**A**	12
15	11	**A**	$2y^3$
16	12	**A**	$-3p^0 = -1$
17	13	**A**	1
18	20	**A**	4×10^{-2}
19	21	**A**	85^{-3}
20	23	**D**	$\frac{3}{2}$
21	4	**A**	8
22	7	**A**	13
23	10	**A**	4
24	14	**A**	$\frac{36y}{x^7}$
25	24	**E**	-1