KINETICS
We Nurture The Future
IIT-JEE | Medical | Foundations

Exponents and Powers

Question 1.
Multiplicative inverse of $\frac{1}{7}$ is
(a) 14
(b) 7
(c) 49
(d) None of these

Answer: (b) 7

Question 2.
Simplify 2×10^3.
(a) 1000
(b) 2000
(c) 16000
(d) None of these

Answer: (b) 2000
$2 \times 10 \times 10 \times 10 = 2000$.

Question 3.
Find $7^3 \div 7^3$.
(a) 7^6
(b) 7^9
(c) 7^0
(d) None of these

Answer: (c) 7^0
$7^{3-3} = 7^0$

Question 4.
The value of $(-1)^{47}$ is
(a) -1
(b) 1
(c) 0
(d) None of these

Answer: (a) -1

Question 5.
Express 72 as a product of powers.
(a) $2^3 \times 3^2$
(b) $3^3 \times 2^3$
(c) $2^3 + 3^2$
(d) None of these

Answer: (a) $2^3 \times 3^2$
Prime factors of $72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$.

Question 6.
Find the number from the following expanded forms $3 \times 10^4 + 7 \times 10^2 + 5 \times 10^0$.
(a) 375
(b) 30705
(c) 3705
(d) None of these

Answer: (b) 30705
30000 + 700 + 5 = 30705.

Question 7.
The short notation 10^4 stands for the product.
(a) $10 \times 10 \times 10 \times 10$
(b) 4×10
(c) 10 + 10 + 10 + 10
(d) None of these

Answer: (a) $10 \times 10 \times 10 \times 10$
10 is multiplied four times.

Question 8.
Simplify $3^4 \div 3^4$.
(a) 3^0
(b) 3^{11}
(c) 3^{28}
(d) None of these

Answer: (a) 3^0
In division power.

Question 9.
The value of $(-1)^{91}$ is
(a) 1
(b) 0
(c) -1
(d) None of these

Answer: (c) -1

Question 10.
The value of $(-1)^{310}$ is
(a) 1
(b) -1
(c) 0
(d) None of these

Answer: (a) 1

Question 11.
Express using exponential notation 343.
(a) 3^7
(b) 7^3
(c) 7
(d) None of these

Answer: (b) 7^3
Prime factors of $343 = 7 \times 7 \times 7$.

Question 12.
Express 729 as a power of 3.
(a) 9^3
(b) 3^4
(c) 3^6
(d) 3^2

Answer: (c) 3^6

Question 13.
In 10^4, 10 is called :
(a) Base
(b) Power
(c) Exponent
(d) None of these

Answer: (a) Base

Question 14.
The number which is multiplied by $(-8)^{-1}$ to obtain a product equal to 10^{-1} is ____.
(a) $\frac{-4}{5}$
(b) $\frac{-3}{5}$
(c) $\frac{-1}{5}$
(d) $\frac{-5}{4}$

Answer: (a) $\frac{-4}{5}$

Question 15.
Express in exponential form $2 \times 2 \times a \times a$.
(a) $2^2 . a^2$
(b) $2^2 . 2^0$
(c) $2^2 + a^2$
(d) None of these

Answer: (a) $2^2 . a^2$
2 is multiplied two times and also a is multiplied two times.

Question 16.
Simplify $5^2 \div 5^6$.
(a) 5^{-4}
(b) 5^4
(c) 5^8
(d) None of these

Answer: (a) 5^{-4}
As $5^{2-6} = 5^{-4}$.

Question 17.
The value of $(-1)^{500}$ is
(a) 1
(b) -1
(c) 0
(d) None of these

Answer: (a) 1

Question 18.
Which is greater 2^3 or 3^2.
(a) 2^3
(b) 3^2
(c) Equal
(d) None of these

Answer: (b) 3^2
$2^3 = 2 \times 2 \times 2 = 8$, $3^2 = 3 \times 3 = 9$.

Question 19.
Simplify 0×12^2.
(a) 1
(b) 20
(c) 0
(d) None of these

Answer: (c) 0
0 is multiplied by any number gives result 0.

Question 20.
Find the value of $\frac{3^5}{3^5}$
(a) 1
(b) 0
(c) 3
(d) None of these

Answer: (a) 1
$3^{5-5} = 3^0 = 1$

Question 21.
The value of 11^0 is _____ .
(a) 3
(b) 11
(c) 1
(d) None of these

Answer: (c) 1

Question 22.
The exponential form of 100000 is
(a) 10^3
(b) 10^4
(c) 10^5
(d) none of these

Answer: (c) 10^5

Question 23.
$(-1)^3$ find value.
(a) 1
(b) -1
(c) -3
(d) None of these

Answer: (b) -1
Negative sign has odd number exponent.

Question 24.
Simplify $2^3 \times 5$.
(a) 30
(b) 40
(c) 20
(d) None of these

Answer: (b) 40
$2^3 \times 5 = 2 \times 2 \times 2 \times 5 = 40$.

Question 25.
Find the value of $2^0 + 3^0 + 4^0$.
(a) 3
(b) 0
(c) 9
(d) None of these

Answer: (a) 3
$2^0 + 3^0 + 4^0 = 1 + 1 + 1 = 3$.

Question 26.
Express 432 as a product of powers of prime factors.
(a) $2^3 \times 3^3$
(b) 8×27
(c) 16×27
(d) $2^4 \times 3^3$

Answer: (d) $2^4 \times 3^3$

Question 27.
Find the value of 11^2.
(a) 121
(b) 22
(c) 5.5
(d) None of these

Answer: (a) 121
$11 \times 11 = 121$.

Question 28.
Simplify $a^2 \times a^4$.
(a) a^8
(b) a^6
(c) a^2
(d) None of these

Answer: (b) a^6
Powers are added as the base of both numbers is a.

Question 29.
Find the number from the following expanded forms
$8 \times 10^4 + 6 \times 10^3 + 0 \times 10^2 + 4 \times 10^1 + 5 \times 10^0$.
(a) 86045
(b) 8645
(c) 86450
(d) None of these

Answer: (a) 86045
$8 \times 10^4 + 6 \times 10^3 + 0 \times 10^2 + 4 \times 10^1 + 5 \times 10^0 = 80000 + 6000 + 0 + 40 + 5$.

Question 30.
Multiplicative inverse of $\frac{1}{5}$ is
(a) 10
(b) 3
(c) 5
(d) None of these

Answer: (c) 5

Question 31.
Solve 1^4.
(a) 1
(b) 4
(c) -1
(d) None of these

Answer: (a) 1
1 is multiplied four times, i.e. $1 \times 1 \times 1 \times 1$.

Question 32.
Solve $2^2 \times 2^3$.
(a) 2^6
(b) 2^5
(c) 4^6
(d) None of these

Answer: (b) 2^5
Powers are added if the base are same in case of multiplication.

Question 33.
Solve $(3^0 + 2^0) \times 5^0$.
(a) 2
(b) 0
(c) 5
(d) None of these

Answer: (a) 2
$(1 + 1) \times 1 = 2 \times 1 = 2$.

Question 34.
The value of 7^0 is _____ .
(a) 7
(b) 21
(c) 1
(d) None of these

Answer: (c) 1

Question 35.
In 10^4, 4 is called :
(a) Base
(b) Power
(c) Exponent
(d) None of

Answer: (c) Exponent

Question 36.
Identify the greater number (i) 4^3 or 3^4.
(a) 4^3
(b) 3^4
(c) Both are equal
(d) None of these

Answer: (b) 3^4
$4 \times 4 \times 4 = 64$, and $3 \times 3 \times 3 \times 3 = 81$.

Question 37.
512 can be written in exponential form as
(a) 2^3
(b) 2^4
(c) 2^9
(d) 2^1

Answer: (c) 2^9

Question 38.
Find the value of $\left(2^3\right)^2$.
(a) 64
(b) 36
(c) 81
(d) None of these

Answer: (a) 64
$2^3 = 2 \times 2 \times 2 = 8$ and $8^2 = 8 \times 8 = 64$.

Question 39.
Solve $2^0 \times 3^0 \times 4^0$.
(a) 1
(b) 24
(c) 0
(d) None of these

Answer: (a) 1
$2^0 \times 3^0 \times 4^0 = 1 \times 1 \times 1 = 1$.

Question 40.
The value of 2^8 is
(a) 1024
(b) 256
(c) 512
(d) 128

Answer: (b) 256

Question 41.
Simplify 0×10^2.
(a) 0
(b) 100
(c) 20
(d) None of these

Answer: (a) 0
0 is multiplied by any number gives result 0.

Question 42.
Express in exponential form : $(2 \times 3)^5$
(a) $3^0 \times 3^0$
(b) $5^2 \times 5^3$
(c) 6^5
(d) None of these

Answer: (c) 6^5
$(a \times b)^x = (ab)^x$.

Question 43.
Express 432 as a product of powers.
(a) $4^2 \times 3^3$
(b) $2^4 \times 3^3$

(c) $2^4 + 3^4$
(d) None of these

Answer: (b) $2^4 \times 3^3$
Prime factor of 432 = 2 × 2 × 2 × 2 × 3 × 3 × 3.

Question 44.
Which is smaller 2^{10} or 10^2 ?
(a) 2^{10}
(b) 10^2
(c) Both are equal
(d) None of these

Answer: (b) 10^2
$2^{10} = 1024$ and $10^2 = 100$, so 10^2 is smaller than 2^{10}.

Question 45.
Expresses 256 as a power of 2.
(a) 2^8
(b) 2 × 8
(c) 2 multiplied 8 times
(d) None of these

Answer: (a) 2^8
Prime factors of 256 = 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2.

Question 46.
The value of $(-1)^{75}$ is
(a) 0
(b) 1
(c) -1
(d) None of these

Answer: (c) -1

Question 47.
The value of $(-1)^{400}$ is
(a) 1

(b) 0
(c) -1
(d) None of these

Answer: (a) 1

State whether the given statements are True or False.

Question 1.
$10 \times 10^{11} = 100^{11}$

Answer: False

Question 2.
$2^3 > 5^2$

Answer: False

Question 3.
$2^3 \times 3^2 = 6^5$

Answer: False

Question 4.
$3^0 = (1000)^0$

Answer: True

Match the following :

1. 72	(a) $2^4 \times 3^3$
2. 1000	(b) $2^3 \times 3^2$
3. 432	(c) $2^7 \times 5^3$
4. 16000	(d) $2^3 \times 5^3$

Answer:

1. 72	(b) $2^3 \times 3^2$
2. 1000	(d) $2^3 \times 5^3$
3. 432	(a) $2^4 \times 3^3$
4. 16000	(c) $2^7 \times 5^3$

Match the following :

1. $(2 \times 3)^5$	(a) $(-4)^3 \times m^3$
2. $(2a)^4$	(b) $2^5 \cdot 3^5$
3. $(-4m)^3$	(c) $2^4 \cdot a^4$

Answer:

1. $(2 \times 3)^5$	(b) $2^5 \cdot 3^5$
2. $(2a)^4$	(c) $2^4 \cdot a^4$
3. $(-4m)^3$	(a) $(-4)^3 \times m^3$

Match the following :

1. 5985.3	(a) 2.7×10^5
2. 65950	(b) 5.9853×10^3
3. 3430,000	(c) 6.595×10^4
4. 279404	(d) 3.43×10^6

Answer:

1. 5985.3	(b) 5.9853×10^3
2. 65950	(c) 6.595×10^4
3. 3430,000	(d) 3.43×10^6
4. 279404	(a) 2.7×10^5

Fill in the blanks.

1. $b^2 \times b^3$ = ……..

Answer: b^5

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2. $a^m \times b^m$ = ……..

Answer: $(ab)^m$

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3. a^0 = ……..

Answer: 1

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4. The number 10^4 is read as ……. raised to the power of …… .

Answer: 10, 4

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5. $(-1)^{\text{even number}}$ = ……..

Answer: 1

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6. $c^4 \div c^5$ = ……..

Answer: c^{-1}

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7. 10^4 is called the …… of 10000.

Answer: exponential form

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8. $(-1)^{\text{odd number}}$ = ……..

Answer: -1

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9. $c^7 \div c^7$ = ……..

Answer: 1

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10. Any number can be expressed as a decimal number between 1.0 and 10.0 including 1.0 multiplied by a power of 10. Such a form of a number is called its …….. .

Answer: standard form
