

Exponents (Level 1)

MCQ Test, Set 02

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

1. There are 25 questions. Each has exactly one correct answer: choose A, B, C or D.
2. Each correct answer carries 1 mark. There is no negative marking.
3. The key sheet and worked solutions are at the end of this test.

1. $z \times z \times z \times z \times z =$

A. z^4

B. 5^z

C. $5z$

D. z^5

2. $3^5 = 243$. Then $3^6 =$

A. 729

B. 246

C. 1458

D. 486

3. 10^6 written in figures is

A. 10,00,000

B. 60

C. 1,00,000

D. 1,00,00,000

4. If $6^{\square} = 216$, the number in the box is

A. 36

B. 2

C. 3

D. 4

5. $3^{11} \times 3^6 =$

A. 9^{17}

B. 3^5

C. 3^{66}

D. 3^{17}

6. $12^{20} \div 12^4 =$

A. 12^{16}

B. 12^{24}

C. 1

D. 12^5

7. $(3^7)^2 =$

A. 3^9

B. 21^2

C. 6^7

D. 3^{14}

8. $4^6 \times 11^6 =$

A. $(15)^6$

B. $(44)^{12}$

C. $(44)^6$

D. $(15)^{12}$

9. $\frac{24^3}{8^3} =$

A. 27

B. 9

C. 3

D. 4096

10. $\left(\frac{7}{12}\right)^0 =$

A. 0

B. $\frac{12}{7}$

C. 1

D. $\frac{7}{12}$

11. $x^{-7} =$

A. $\frac{1}{7x}$

B. $\frac{1}{x^7}$

C. $-x^7$

D. $-7x$

12.	$\left(\frac{3}{7}\right)^{-2} =$	A. $-\frac{9}{49}$	B. $\frac{49}{9}$	C. $\frac{9}{49}$	D. $-\frac{6}{7}$
13.	$(-1)^{45} + (-1)^{62} =$	A. 2	B. 1	C. 0	D. -2
14.	$(-6)^{15} =$	A. 15^6	B. -6^{15}	C. 6^{-15}	D. 6^{15}
15.	If $3^{x-1} = 81$, then $x =$	A. 5	B. 4	C. 3	D. 82
16.	If $5^{2x+1} = 125$, then $x =$	A. 62	B. 3	C. 2	D. 1
17.	$7^{x-2} =$	A. $\frac{7^x}{49}$	B. $7^x - 49$	C. $\frac{7^x}{14}$	D. 49×7^x
18.	$\left(\frac{r}{2}\right)^6 =$	A. $\frac{r^7}{64}$	B. $\frac{r^6}{2}$	C. $\frac{r^6}{64}$	D. $\frac{r^6}{12}$
19.	$\frac{2^6 \times 2^5}{2^8} =$	A. 2^3	B. 2^{19}	C. 2^{-3}	D. 2^{22}
20.	$7^{-9} \times 7^{12} =$	A. 7^{-21}	B. 7^3	C. 7^{-108}	D. 7^{-3}
21.	If $2^m \times 2^3 = 2048$, then $m =$	A. 14	B. 8	C. -14	D. -8
22.	$6^3 \times \left(\frac{5}{6}\right)^3 =$	A. $\frac{125}{216}$	B. 25	C. 125	D. 15
23.	$\frac{2^{\frac{15}{2}} \times 2^{-\frac{5}{2}}}{2^7} =$	A. 4	B. 4096	C. 8	D. $\frac{1}{4}$
24.	$8 \times \left(\frac{7}{2}\right)^3 =$	A. $\frac{343}{8}$	B. 343	C. 28	D. 84
25.	$(2^{-1} + 4^{-1} + 6^{-1})^0 =$	A. $\frac{11}{12}$	B. -12	C. 0	D. 1

Key sheet

1. D	2. A	3. A	4. C	5. D
6. A	7. D	8. C	9. A	10. C
11. B	12. B	13. C	14. B	15. A
16. D	17. A	18. C	19. A	20. B
21. B	22. C	23. D	24. B	25. D

Solutions

1. $z \times z \times z \times z \times z =$

z is multiplied by itself 5 times.

$$z \times z \times z \times z \times z = z^5$$

Ans: (D) z^5

2. $3^5 = 243$. Then $3^6 =$

$$3^6 = 3^5 \times 3$$

$$= 243 \times 3 = 729$$

Ans: (A) 729

3. 10^6 written in figures is

$10^6 = 1$ followed by 6 zeros

$$= 10,00,000$$

Ans: (A) 10,00,000

4. If $6^{\square} = 216$, the number in the box is

Dividing repeatedly by 6: 216, 36, 6, that is 3 times.

$$216 = 6^3$$

Ans: (C) 3

5. $3^{11} \times 3^6 =$

Using $a^m \times a^n = a^{m+n}$

$$3^{11} \times 3^6 = 3^{11+6} = 3^{17}$$

Ans: (D) 3^{17}

6. $12^{20} \div 12^4 =$

Using $\frac{a^m}{a^n} = a^{m-n}$

$$12^{20} \div 12^4 = 12^{20-4} = 12^{16}$$

Ans: (A) 12^{16}

7. $(3^7)^2 =$

Using $(a^m)^n = a^{m \times n}$

$$(3^7)^2 = 3^{7 \times 2} = 3^{14}$$

Ans: (D) 3^{14}

8. $4^6 \times 11^6 =$

Using $a^n \times b^n = (a \times b)^n$

$$4^6 \times 11^6 = (4 \times 11)^6 = (44)^6$$

Ans: (C) $(44)^6$

9. $\frac{24^3}{8^3} =$

Using $\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$

$$\frac{24^3}{8^3} = \left(\frac{24}{8}\right)^3 = 3^3 = 27$$

Ans: (A) 27

10. $\left(\frac{7}{12}\right)^0 =$

Using $a^0 = 1$ ($a \neq 0$)

$$\left(\frac{7}{12}\right)^0 = 1$$

Ans: (C) 1

11. $x^{-7} =$

Using $a^{-n} = \frac{1}{a^n}$

$$x^{-7} = \frac{1}{x^7}$$

Ans: (B) $\frac{1}{x^7}$

12. $\left(\frac{3}{7}\right)^{-2} =$

Using $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$

$$\left(\frac{3}{7}\right)^{-2} = \left(\frac{7}{3}\right)^2 = \frac{49}{9}$$

Ans: (B) $\frac{49}{9}$

13. $(-1)^{45} + (-1)^{62} =$

45 is odd, so $(-1)^{45} = -1$; 62 is even, so $(-1)^{62} = 1$.

$$(-1)^{45} + (-1)^{62} = -1 + 1 = 0$$

Ans: (C) 0

14. $(-6)^{15} =$

15 is odd, so $(-6)^{15} = -6^{15}$

Ans: (B) -6^{15}

15. If $3^{x-1} = 81$, then $x =$

Given, $3^{x-1} = 81$

Dividing 81 repeatedly by 3: 81, 27, 9, 3, so $81 = 3^4$.

$$\Rightarrow 3^{x-1} = 3^4$$

Using $a^m = a^n \Rightarrow m = n$

$$\Rightarrow x - 1 = 4$$

$$\Rightarrow x = 4 + 1$$

$$\Rightarrow x = 5$$

Ans: (A) 5

16. If $5^{2x+1} = 125$, then $x =$

Given, $5^{2x+1} = 125$

Dividing 125 repeatedly by 5: 125, 25, 5, so $125 = 5^3$.

$$\Rightarrow 5^{2x+1} = 5^3$$

Using $a^m = a^n \Rightarrow m = n$

$$\Rightarrow 2x + 1 = 3$$

$$\Rightarrow 2x = 3 - 1$$

$$\Rightarrow 2x = 2$$

$$\Rightarrow x = \frac{2}{2} = 1$$

Ans: (D) 1

17. $7^{x-2} =$

Using $a^{m-n} = \frac{a^m}{a^n}$

$$7^{x-2} = \frac{7^x}{7^2} = \frac{7^x}{49}$$

Ans: (A) $\frac{7^x}{49}$

18. $\left(\frac{r}{2}\right)^6 =$

Using $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ and $(a^m)^n = a^{m \times n}$

$$\left(\frac{r}{2}\right)^6 = \frac{r^6}{2^6}$$

$$= \frac{r^6}{64}$$

Ans: (C) $\frac{r^6}{64}$

19. $\frac{2^6 \times 2^5}{2^8} =$

Using $a^m \times a^n = a^{m+n}$ and $\frac{a^m}{a^n} = a^{m-n}$

$$\frac{2^6 \times 2^5}{2^8} = \frac{2^{11}}{2^8}$$

$$= 2^{11-8} = 2^3$$

Ans: (A) 2^3

20. $7^{-9} \times 7^{12} =$

Using $a^m \times a^n = a^{m+n}$

$$7^{-9} \times 7^{12} = 7^{-9+12} = 7^3$$

$$= 343$$

Ans: (B) 7^3

21. If $2^m \times 2^3 = 2048$, then $m =$

Given, $2^m \times 2^3 = 2048$

Dividing 2048 repeatedly by 2: 2048, 1024, 512, 256, 128, 64, 32, 16, 8, 4, 2, so $2048 = 2^{11}$.

$$\Rightarrow 2^{m+3} = 2^{11} \quad (a^m \times a^n = a^{m+n})$$

Using $a^m = a^n \Rightarrow m = n$

$$\Rightarrow m + 3 = 11$$

$$\Rightarrow m = 11 - 3$$

$$\Rightarrow m = 8$$

Ans: (B) 8

22. $6^3 \times \left(\frac{5}{6}\right)^3 =$

Using $a^n \times b^n = (a \times b)^n$

$$6^3 \times \left(\frac{5}{6}\right)^3 = \left(6 \times \frac{5}{6}\right)^3$$

$$= 5^3 = 125$$

Ans: (C) 125

23. $\frac{2^{\frac{15}{2}} \times 2^{-\frac{5}{2}}}{2^7} =$

Using $a^m \times a^n = a^{m+n}$ and $\frac{a^m}{a^n} = a^{m-n}$

$$\frac{2^{\frac{15}{2}} \times 2^{-\frac{5}{2}}}{2^7} = \frac{2^{\frac{15}{2} + (-\frac{5}{2})}}{2^7}$$

$$= \frac{2^{\frac{10}{2}}}{2^7} = \frac{2^5}{2^7}$$

$$= 2^{5-7} = 2^{-2}$$

$$= \frac{1}{2^2} = \frac{1}{4}$$

Ans: (D) $\frac{1}{4}$

24. $8 \times \left(\frac{7}{2}\right)^3 =$

Using $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

$$8 \times \left(\frac{7}{2}\right)^3 = 8 \times \frac{7^3}{2^3}$$

$$= 8 \times \frac{343}{8}$$

$$= 343$$

Ans: (B) 343

25. $(2^{-1} + 4^{-1} + 6^{-1})^0 =$

Using $a^0 = 1$ ($a \neq 0$)

The bracket is not zero, so its power 0 is 1.

Ans: (D) 1
