

Exponents (Level 1)

MCQ Test, Set 05

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

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

1. In exponential form, $10 \times 10 \times 10 \times 10 =$

A. 40**B.** 10^3 **C.** 10^4 **D.** 4^{10}

2. $13^2 =$

A. 26**B.** 13**C.** 8192**D.** 169

3. Which is the largest of 2^{10} , 10^2 , 3^6 , 6^3 ?

A. 6^3 **B.** 3^6 **C.** 10^2 **D.** 2^{10}

4. 225 written as a power of 15 is

A. 15^3 **B.** 2^{15} **C.** 15^2 **D.** 15^1

5. $15^2 \times 15^9 =$

A. 15^{18} **B.** 225^{11} **C.** 15^{11} **D.** 15^7

6. $\frac{9^{10}}{9^2} =$

A. 9^8 **B.** 9^5 **C.** 9^{12} **D.** 1

7. $(z^4)^6 =$

A. $6z^4$ **B.** z^{24} **C.** z^{10} **D.** $24z$

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

A. $(48)^4$ **B.** $(14)^4$ **C.** $(14)^8$ **D.** $(48)^8$

9. $\frac{10^3}{4^3} =$

A. $\frac{125}{8}$ **B.** $\frac{5}{2}$ **C.** $\frac{15}{2}$ **D.** 216

10. $(a + 2b)^0 =$

A. 0**B.** $a + 2b$ **C.** $2b$ **D.** 1

11. $b^{-4} =$

A. $-b^4$ **B.** $\frac{1}{b^4}$ **C.** $-4b$ **D.** $\frac{1}{4b}$

12.	$\left(\frac{2}{9}\right)^{-2} =$	A. $\frac{4}{81}$	B. $-\frac{4}{81}$	C. $-\frac{4}{9}$	D. $\frac{81}{4}$
13.	$(-1)^{13} \times (-1)^{29} =$	A. 0	B. -2	C. 2	D. 1
14.	$(-11)^2 =$	A. 22	B. -22	C. 121	D. -121
15.	If $19^{2x} = 19^{14}$, then $x =$	A. -7	B. 7	C. 28	D. 14
16.	If $7^{x+5} = 343$, then $x =$	A. 8	B. 3	C. 338	D. -2
17.	$\left(\frac{5}{8}\right)^3 =$	A. $\left(\frac{8}{5}\right)^{-3}$	B. $\left(-\frac{8}{5}\right)^3$	C. $\left(\frac{5}{8}\right)^{-3}$	D. $-\left(\frac{8}{5}\right)^{-3}$
18.	$(5a^2)^3 =$	A. $15a^6$	B. $125a^5$	C. $5a^6$	D. $125a^6$
19.	$9^5 \times 9^2 \times 9^8 =$	A. 9^{15}	B. 27^{15}	C. 9^{80}	D. 9^7
20.	$(10^2)^{-2} =$	A. 10^0	B. 10^{-4}	C. -10^4	D. 10^4
21.	If $(3^2)^x = 81$, then $x =$	A. -2	B. 4	C. 2	D. 3
22.	$\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{10}\right)^{-2} =$	A. 225	B. 113	C. 30	D. -113
23.	$3^{\frac{7}{2}} \times 3^{-\frac{1}{2}} =$	A. 27	B. $3^{-\frac{7}{4}}$	C. $3^{\frac{3}{2}}$	D. 81
24.	$(3^{-1} - 6^{-1}) \div 4^{-1} =$	A. $\frac{4}{3}$	B. $\frac{1}{24}$	C. $\frac{2}{3}$	D. 2
25.	$(2^3 \div 2^7)^2 \times 2^5 =$	A. 2	B. $\frac{1}{8}$	C. 8	D. $\frac{1}{256}$

Key sheet

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

Solutions

1. In exponential form, $10 \times 10 \times 10 \times 10 =$

10 is multiplied by itself 4 times.

$$10 \times 10 \times 10 \times 10 = 10^4$$

Ans: (C) 10^4

2. $13^2 =$

$$13^2 = 13 \times 13$$

$$= 169$$

Ans: (D) 169

3. Which is the largest of 2^{10} , 10^2 , 3^6 , 6^3 ?

$$2^{10} = 1024, 10^2 = 100, 3^6 = 729, 6^3 = 216$$

The largest is 2^{10} .

Ans: (D) 2^{10}

4. 225 written as a power of 15 is

Dividing repeatedly by 15: 225, 15, that is 2 times.

$$225 = 15^2$$

Ans: (C) 15^2

5. $15^2 \times 15^9 =$

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

$$15^2 \times 15^9 = 15^{2+9} = 15^{11}$$

Ans: (C) 15^{11}

6. $\frac{9^{10}}{9^2} =$

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

$$\frac{9^{10}}{9^2} = 9^{10-2} = 9^8$$

Ans: (A) 9^8

7. $(z^4)^6 =$

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

$$(z^4)^6 = z^{4 \times 6} = z^{24}$$

Ans: (B) z^{24}

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

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

$$6^4 \times 8^4 = (6 \times 8)^4 = (48)^4$$

Ans: (A) $(48)^4$

9. $\frac{10^3}{4^3} =$

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

$$\frac{10^3}{4^3} = \left(\frac{10}{4}\right)^3 = \left(\frac{5}{2}\right)^3 = \frac{125}{8}$$

Ans: (A) $\frac{125}{8}$

10. $(a + 2b)^0 =$

Taking $a + 2b \neq 0$: Using $a^0 = 1$ ($a \neq 0$)

$$(a + 2b)^0 = 1$$

Ans: (D) 1

11. $b^{-4} =$

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

$$b^{-4} = \frac{1}{b^4}$$

Ans: (B) $\frac{1}{b^4}$

12. $\left(\frac{2}{9}\right)^{-2} =$

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

$$\left(\frac{2}{9}\right)^{-2} = \left(\frac{9}{2}\right)^2 = \frac{81}{4}$$

Ans: (D) $\frac{81}{4}$

13. $(-1)^{13} \times (-1)^{29} =$

13 is odd, so $(-1)^{13} = -1$; 29 is odd, so $(-1)^{29} = -1$.

$$(-1)^{13} \times (-1)^{29} = -1 \times (-1) = 1$$

Ans: (D) 1

14. $(-11)^2 =$

Using $(-a)^n = -a^n$ if n is odd, $(-a)^n = a^n$ if n is even

$$(-11)^2 = 11^2 = 121$$

Ans: (C) 121

15. If $19^{2x} = 19^{14}$, then $x =$

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

$$\Rightarrow 2x = 14$$

$$\Rightarrow x = \frac{14}{2} = 7$$

Ans: (B) 7

16. If $7^{x+5} = 343$, then $x =$

Given, $7^{x+5} = 343$

Dividing 343 repeatedly by 7: 343, 49, 7, so $343 = 7^3$.

$$\Rightarrow 7^{x+5} = 7^3$$

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

$$\Rightarrow x + 5 = 3$$

$$\Rightarrow x = 3 - 5$$

$$\Rightarrow x = -2$$

Ans: (D) -2

17. $\left(\frac{5}{8}\right)^3 =$

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

$$\left(\frac{5}{8}\right)^3 = \left(\frac{8}{5}\right)^{-3}$$

Ans: (A) $\left(\frac{8}{5}\right)^{-3}$

18. $(5a^2)^3 =$

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

$$(5a^2)^3 = 5^3 \times (a^2)^3$$

$$= 125 \times a^6 = 125a^6$$

Ans: (D) $125a^6$

19. $9^5 \times 9^2 \times 9^8 =$

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

$$9^5 \times 9^2 \times 9^8 = 9^{5+2+8} = 9^{15}$$

Ans: (A) 9^{15}

20. $(10^2)^{-2} =$

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

$$(10^2)^{-2} = 10^{2 \times (-2)} = 10^{-4}$$

$$= \frac{1}{10^4} = \frac{1}{10,000}$$

Ans: (B) 10^{-4}

21. If $(3^2)^x = 81$, then $x =$

Given, $(3^2)^x = 81$

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

$$\Rightarrow 3^{2x} = 3^4 \quad ((a^m)^n = a^{m \times n})$$

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

$$\Rightarrow 2x = 4$$

$$\Rightarrow x = \frac{4}{2} = 2$$

Ans: (C) 2

$$22. \left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{10}\right)^{-2} =$$

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

$$\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{10}\right)^{-2} = (2)^2 + (3)^2 + (10)^2$$

$$= 4 + 9 + 100$$

$$= 113$$

Ans: (B) 113

$$23. 3^{\frac{7}{2}} \times 3^{-\frac{1}{2}} =$$

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

$$3^{\frac{7}{2}} \times 3^{-\frac{1}{2}} = 3^{\frac{7}{2} + (-\frac{1}{2})}$$

$$= 3^{\frac{6}{2}} = 3^3$$

$$= 27$$

Ans: (A) 27

$$24. (3^{-1} - 6^{-1}) \div 4^{-1} =$$

$$(3^{-1} - 6^{-1}) \div 4^{-1} = \left(\frac{1}{3} - \frac{1}{6}\right) \div \frac{1}{4}$$

$$= \frac{6-3}{18} \div \frac{1}{4} = \frac{1}{6} \div \frac{1}{4}$$

$$= \frac{1}{6} \times 4 = \frac{2}{3}$$

Ans: (C) $\frac{2}{3}$

$$25. (2^3 \div 2^7)^2 \times 2^5 =$$

$$(2^3 \div 2^7)^2 \times 2^5 = \left(\frac{2^3}{2^7}\right)^2 \times 2^5$$

$$= (2^{3-7})^2 \times 2^5 = (2^{-4})^2 \times 2^5$$

$$= 2^{-8} \times 2^5 \quad ((a^m)^n = a^{m \times n})$$

$$= 2^{-8+5} = 2^{-3}$$

$$= \frac{1}{2^3} = \frac{1}{8}$$

Ans: (B) $\frac{1}{8}$
