

Exponents (Level 1)

MCQ Test, Set 08

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.

- p^9 is read as
 A. p times 9 B. 9 power p C. p squared D. p power 9
- $5^3 = 125$. Then $5^4 =$
 A. 625 B. 130 C. 500 D. 250
- $10,000 =$
 A. 4^{10} B. 10^3 C. 10^4 D. 10^5
- If $17^{\square} = 289$, the number in the box is
 A. 3 B. 17 C. 1 D. 2
- $19^3 \times 19^4 =$
 A. 19^{12} B. 361^7 C. 19^7 D. 19^1
- $\frac{4^{21}}{4^7} =$
 A. 4^{14} B. 4^3 C. 1 D. 4^{28}
- $(15^6)^2 =$
 A. 30^6 B. 90^2 C. 15^8 D. 15^{12}
- $11^{10} \times 2^{10} =$
 A. $(22)^{20}$ B. $(13)^{20}$ C. $(22)^{10}$ D. $(13)^{10}$
- $\frac{50^3}{10^3} =$
 A. 5 B. 125 C. 64,000 D. 15
- $4^0 + 3^0 + 2^0 =$
 A. 9 B. 0 C. 1 D. 3
- $t^{-9} =$
 A. $-9t$ B. $\frac{1}{t^9}$ C. $\frac{1}{9t}$ D. $-t^9$

12.	$\left(\frac{3}{10}\right)^{-2} =$	A. $\frac{100}{9}$	B. $-\frac{9}{100}$	C. $-\frac{3}{5}$	D. $\frac{9}{100}$
13.	$(-1)^{64} =$	A. -64	B. -1	C. 64	D. 1
14.	$(-y)^{11} =$	A. $-11y$	B. $11y$	C. $-y^{11}$	D. y^{11}
15.	If $23^{x-6} = 23^6$, then $x =$	A. 6	B. 12	C. 0	D. -12
16.	If $8^{x+1} = 512$, then $x =$	A. 511	B. 2	C. 3	D. 4
17.	$2^{x-4} =$	A. $\frac{2^x}{16}$	B. 16×2^x	C. $\frac{2^x}{8}$	D. $2^x - 16$
18.	$\left(\frac{2}{q}\right)^4 =$	A. $\frac{16}{q^4}$	B. $\frac{2}{q^4}$	C. $\frac{8}{q^4}$	D. $\frac{16}{q^5}$
19.	$\frac{(7^2)^5 \times 7^3}{7^{10}} =$	A. 7^{20}	B. 7^3	C. 7^{23}	D. 7^0
20.	$10^1 \div 10^{-2} =$	A. 10^3	B. 10^1	C. 10^{-1}	D. 10^{-3}
21.	If $10^{x+1} = \frac{1}{1000}$, then $x =$	A. 4	B. -2	C. 2	D. -4
22.	$(2^{-4} \div 2^{-9}) \times 2^{-2} =$	A. $\frac{1}{8}$	B. $\frac{1}{128}$	C. 8	D. 128
23.	$11^{\frac{3}{2}} \times 11^{\frac{1}{2}} =$	A. 11	B. 121	C. $11^{\frac{3}{4}}$	D. $\frac{1}{121}$
24.	$(2^{-1} - 6^{-1}) \div 3^{-1} =$	A. $\frac{1}{9}$	B. 1	C. $\frac{3}{4}$	D. 2
25.	$\left(\frac{2}{7}\right)^{-4} \times \left(\frac{3}{2}\right)^{-2} \times \left(\frac{7}{3}\right)^{-3} =$	A. $\frac{4}{21}$	B. 84	C. $\frac{21}{4}$	D. $\frac{3}{28}$

Key sheet

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

Solutions

1. p^9 is read as

$$p^9 = p \times p \times p \times p \times p \times p \times p \times p \times p$$

It is read as p power 9.

Ans: (D) p power 9

2. $5^3 = 125$. Then $5^4 =$

$$5^4 = 5^3 \times 5$$

$$= 125 \times 5 = 625$$

Ans: (A) 625

3. 10,000 =

10,000 is 1 followed by 4 zeros.

$$10,000 = 10^4$$

Ans: (C) 10^4

4. If $17^{\square} = 289$, the number in the box is

Dividing repeatedly by 17: 289, 17, that is 2 times.

$$289 = 17^2$$

Ans: (D) 2

5. $19^3 \times 19^4 =$

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

$$19^3 \times 19^4 = 19^{3+4} = 19^7$$

Ans: (C) 19^7

6. $\frac{4^{21}}{4^7} =$

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

$$\frac{4^{21}}{4^7} = 4^{21-7} = 4^{14}$$

Ans: (A) 4^{14}

7. $(15^6)^2 =$

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

$$(15^6)^2 = 15^{6 \times 2} = 15^{12}$$

Ans: (D) 15^{12}

8. $11^{10} \times 2^{10} =$

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

$$11^{10} \times 2^{10} = (11 \times 2)^{10} = (22)^{10}$$

Ans: (C) $(22)^{10}$

9. $\frac{50^3}{10^3} =$

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

$$\frac{50^3}{10^3} = \left(\frac{50}{10}\right)^3 = 5^3 = 125$$

Ans: (B) 125

10. $4^0 + 3^0 + 2^0 =$

$$4^0 = 3^0 = 2^0 = 1$$

$$4^0 + 3^0 + 2^0 = 1 + 1 + 1 = 3$$

Ans: (D) 3

11. $t^{-9} =$

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

$$t^{-9} = \frac{1}{t^9}$$

Ans: (B) $\frac{1}{t^9}$

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

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

$$\left(\frac{3}{10}\right)^{-2} = \left(\frac{10}{3}\right)^2 = \frac{100}{9}$$

Ans: (A) $\frac{100}{9}$

13. $(-1)^{64} =$

64 is even and $(-1)^{\text{even number}} = 1$.

$$(-1)^{64} = 1$$

Ans: (D) 1

14. $(-y)^{11} =$

11 is odd, so $(-y)^{11} = -y^{11}$

Ans: (C) $-y^{11}$

15. If $23^{x-6} = 23^6$, then $x =$

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

$$\Rightarrow x - 6 = 6$$

$$\Rightarrow x = 6 + 6$$

$$\Rightarrow x = 12$$

Ans: (B) 12

16. If $8^{x+1} = 512$, then $x =$

Given, $8^{x+1} = 512$

Dividing 512 repeatedly by 8: 512, 64, 8, so $512 = 8^3$.

$$\Rightarrow 8^{x+1} = 8^3$$

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

$$\Rightarrow x + 1 = 3$$

$$\Rightarrow x = 3 - 1$$

$$\Rightarrow x = 2$$

Ans: (B) 2

17. $2^{x-4} =$

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

$$2^{x-4} = \frac{2^x}{2^4} = \frac{2^x}{16}$$

Ans: (A) $\frac{2^x}{16}$

18. $\left(\frac{2}{q}\right)^4 =$

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

$$\left(\frac{2}{q}\right)^4 = \frac{2^4}{q^4}$$

$$= \frac{16}{q^4}$$

Ans: (A) $\frac{16}{q^4}$

19. $\frac{(7^2)^5 \times 7^3}{7^{10}} =$

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

$$\frac{(7^2)^5 \times 7^3}{7^{10}} = \frac{7^{10} \times 7^3}{7^{10}} = \frac{7^{13}}{7^{10}}$$

Using $\frac{a^m}{a^n} = a^{m-n}$: $7^{13-10} = 7^3$

Ans: (B) 7^3

20. $10^1 \div 10^{-2} =$

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

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

$$= 1000$$

Ans: (A) 10^3

21. If $10^{x+1} = \frac{1}{1000}$, then $x =$

Given, $10^{x+1} = \frac{1}{1000}$

$$\frac{1}{1000} = \frac{1}{10^3} = 10^{-3} \text{ (dividing 1000 repeatedly by 10: 1000, 100, 10)}$$

$$\Rightarrow 10^{x+1} = 10^{-3}$$

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

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

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

$$\Rightarrow x = -4$$

Ans: (D) -4

$$\begin{aligned}
 22. \quad & (2^{-4} \div 2^{-9}) \times 2^{-2} = \\
 & (2^{-4} \div 2^{-9}) \times 2^{-2} = \frac{2^{-4}}{2^{-9}} \times 2^{-2} \\
 & = 2^{-4+9} \times 2^{-2} = 2^5 \times 2^{-2} \\
 & = 2^{5-2} = 2^3 \\
 & = 8
 \end{aligned}$$

Ans: (C) 8

$$\begin{aligned}
 23. \quad & 11^{\frac{3}{2}} \times 11^{\frac{1}{2}} = \\
 & \text{Using } a^m \times a^n = a^{m+n} \\
 & 11^{\frac{3}{2}} \times 11^{\frac{1}{2}} = 11^{\frac{3}{2} + \frac{1}{2}} \\
 & = 11^{\frac{4}{2}} = 11^2 \\
 & = 121
 \end{aligned}$$

Ans: (B) 121

$$\begin{aligned}
 24. \quad & (2^{-1} - 6^{-1}) \div 3^{-1} = \\
 & (2^{-1} - 6^{-1}) \div 3^{-1} = \left(\frac{1}{2} - \frac{1}{6}\right) \div \frac{1}{3} \\
 & = \frac{6-2}{12} \div \frac{1}{3} = \frac{1}{3} \div \frac{1}{3} \\
 & = \frac{1}{3} \times 3 = 1
 \end{aligned}$$

Ans: (B) 1

$$\begin{aligned}
 25. \quad & \left(\frac{2}{7}\right)^{-4} \times \left(\frac{3}{2}\right)^{-2} \times \left(\frac{7}{3}\right)^{-3} = \\
 & \text{Using } \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n \\
 & \left(\frac{2}{7}\right)^{-4} \times \left(\frac{3}{2}\right)^{-2} \times \left(\frac{7}{3}\right)^{-3} = \left(\frac{7}{2}\right)^4 \times \left(\frac{2}{3}\right)^2 \times \left(\frac{3}{7}\right)^3 \\
 & = \frac{7^4}{2^4} \times \frac{2^2}{3^2} \times \frac{3^3}{7^3} \\
 & = 2^{-2} \times 7^1 \times 3^1 \quad (a^m \times a^n = a^{m+n}, \frac{a^m}{a^n} = a^{m-n}) \\
 & = \frac{1}{4} \times 7 \times 3 \\
 & = \frac{21}{4}
 \end{aligned}$$

Ans: (C) $\frac{21}{4}$
