

Exponents (Level 1)

MCQ Test, Set 03

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. $\frac{3}{7} \times \frac{3}{7} \times \frac{3}{7} =$

A. $\frac{3}{7^3}$

B. $\left(\frac{3}{7}\right)^3$

C. $\frac{3^3}{7}$

D. $\frac{9}{7}$

2. $7^3 =$

A. 21

B. 2187

C. 49

D. 343

3. Which is the smallest of $2^5, 5^2, 3^3, 6^2$?

A. 2^5

B. 3^3

C. 5^2

D. 6^2

4. 1024 written as a power of 2 is

A. 2^9

B. 2^{11}

C. 2^{10}

D. 10^2

5. $\left(\frac{1}{3}\right)^5 \times \left(\frac{1}{3}\right)^4 =$

A. $\left(\frac{1}{9}\right)^9$

B. $\left(\frac{1}{3}\right)^1$

C. $\left(\frac{1}{3}\right)^{20}$

D. $\left(\frac{1}{3}\right)^9$

6. $\frac{x^{15}}{x^6} =$

A. x^{21}

B. x^9

C. 1

D. $x^{\frac{5}{2}}$

7. $(10^3)^8 =$

A. 30^8

B. 80^3

C. 10^{11}

D. 10^{24}

8. $a^5 \times b^5 =$

A. $(ab)^5$

B. $(ab)^{10}$

C. ab^5

D. $(a + b)^5$

9. $\frac{28^3}{7^3} =$

A. 4

B. 64

C. 12

D. 9261

10. $5^0 + 5^1 =$

A. 2

B. 10

C. 5

D. 6

11. $\frac{1}{8^5} =$

A. -8^5

B. 8^5

C. 8^{-5}

D. 5^{-8}

12.	$\left(\frac{1}{4}\right)^{-3} =$	A. $-\frac{1}{64}$	B. $-\frac{3}{4}$	C. 64	D. $\frac{1}{64}$
13.	$(-1)^{150} =$	A. 1	B. -150	C. 150	D. -1
14.	$(-6)^4 =$	A. 24	B. -1296	C. 1296	D. -24
15.	If $6^{x+8} = 6^{11}$, then $x =$	A. 3	B. -3	C. 11	D. 19
16.	If $4^{2m-3} = 64$, then $m =$	A. 6	B. 3	C. $\frac{67}{2}$	D. 0
17.	$3^{3x} =$	A. 27^x	B. 3^{x+3}	C. $27x$	D. 9^x
18.	$(3y)^4 =$	A. $12y^4$	B. $81y^5$	C. $3y^4$	D. $81y^4$
19.	$6^3 \times 6^7 \times 6^{10} =$	A. 6^{20}	B. 18^{20}	C. 6^{210}	D. 6^{10}
20.	$(5^{-1})^{-3} =$	A. 5^4	B. 5^{-4}	C. 5^3	D. 5^{-3}
21.	If $(-7)^{m-2} \times (-7)^5 = (-7)^{10}$, then $m =$	A. 13	B. -13	C. 7	D. -7
22.	$(2^0 + 6^{-1}) \times 6^2 =$	A. 42	B. -180	C. 78	D. 6
23.	$4^{\frac{7}{2}} \div 4^{\frac{3}{2}} =$	A. $\frac{1}{16}$	B. 16	C. 1024	D. $4^{\frac{7}{3}}$
24.	$(5^{-1} - 6^{-1}) \div 3^{-1} =$	A. $\frac{11}{10}$	B. $\frac{1}{90}$	C. 4	D. $\frac{1}{10}$
25.	$\left(\frac{5}{2}\right)^{-3} \times \left(\frac{3}{5}\right)^{-1} \times \left(\frac{2}{3}\right)^{-2} =$	A. $\frac{3}{50}$	B. $\frac{6}{25}$	C. $\frac{25}{6}$	D. 150

Key sheet

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

Solutions

1. $\frac{3}{7} \times \frac{3}{7} \times \frac{3}{7} =$

$\frac{3}{7}$ is multiplied by itself 3 times.

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

Ans: (B) $\left(\frac{3}{7}\right)^3$

2. $7^3 =$

$$7^3 = 7 \times 7 \times 7$$

$$= 343$$

Ans: (D) 343

3. Which is the smallest of 2^5 , 5^2 , 3^3 , 6^2 ?

$$2^5 = 32, 5^2 = 25, 3^3 = 27, 6^2 = 36$$

The smallest is 5^2 .

Ans: (C) 5^2

4. 1024 written as a power of 2 is

Dividing repeatedly by 2: 1024, 512, 256, 128, 64, 32, 16, 8, 4, 2, that is 10 times.

$$1024 = 2^{10}$$

Ans: (C) 2^{10}

5. $\left(\frac{1}{3}\right)^5 \times \left(\frac{1}{3}\right)^4 =$

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

$$\left(\frac{1}{3}\right)^5 \times \left(\frac{1}{3}\right)^4 = \left(\frac{1}{3}\right)^{5+4} = \left(\frac{1}{3}\right)^9$$

Ans: (D) $\left(\frac{1}{3}\right)^9$

6. $\frac{x^{15}}{x^6} =$

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

$$\frac{x^{15}}{x^6} = x^{15-6} = x^9$$

Ans: (B) x^9

7. $(10^3)^8 =$

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

$$(10^3)^8 = 10^{3 \times 8} = 10^{24}$$

Ans: (D) 10^{24}

8. $a^5 \times b^5 =$

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

$$a^5 \times b^5 = (a \times b)^5 = (ab)^5$$

Ans: (A) $(ab)^5$

9. $\frac{28^3}{7^3} =$

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

$$\frac{28^3}{7^3} = \left(\frac{28}{7}\right)^3 = 4^3 = 64$$

Ans: (B) 64

10. $5^0 + 5^1 =$

$$5^0 = 1, 5^1 = 5$$

$$5^0 + 5^1 = 1 + 5 = 6$$

Ans: (D) 6

11. $\frac{1}{8^5} =$

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

$$\frac{1}{8^5} = 8^{-5}$$

Ans: (C) 8^{-5}

12. $\left(\frac{1}{4}\right)^{-3} =$

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

$$\left(\frac{1}{4}\right)^{-3} = 4^3 = 64$$

Ans: (C) 64

13. $(-1)^{150} =$

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

$$(-1)^{150} = 1$$

Ans: (A) 1

14. $(-6)^4 =$

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

$$(-6)^4 = 6^4 = 1296$$

Ans: (C) 1296

15. If $6^{x+8} = 6^{11}$, then $x =$

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

$$\Rightarrow x + 8 = 11$$

$$\Rightarrow x = 11 - 8$$

$$\Rightarrow x = 3$$

Ans: (A) 3

16. If $4^{2m-3} = 64$, then $m =$

Given, $4^{2m-3} = 64$

Dividing 64 repeatedly by 4: 64, 16, 4, so $64 = 4^3$.

$$\Rightarrow 4^{2m-3} = 4^3$$

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

$$\Rightarrow 2m - 3 = 3$$

$$\Rightarrow 2m = 3 + 3$$

$$\Rightarrow 2m = 6$$

$$\Rightarrow m = \frac{6}{2} = 3$$

Ans: (B) 3

17. $3^{3x} =$

Using $a^{mn} = (a^m)^n$

$$3^{3x} = (3^3)^x = 27^x$$

Ans: (A) 27^x

18. $(3y)^4 =$

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

$$(3y)^4 = 3^4 \times y^4$$

$$= 81 \times y^4 = 81y^4$$

Ans: (D) $81y^4$

19. $6^3 \times 6^7 \times 6^{10} =$

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

$$6^3 \times 6^7 \times 6^{10} = 6^{3+7+10} = 6^{20}$$

Ans: (A) 6^{20}

20. $(5^{-1})^{-3} =$

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

$$(5^{-1})^{-3} = 5^{(-1) \times (-3)} = 5^3$$

$$= 125$$

Ans: (C) 5^3

21. If $(-7)^{m-2} \times (-7)^5 = (-7)^{10}$, then $m =$

Given, $(-7)^{m-2} \times (-7)^5 = (-7)^{10}$

$$\Rightarrow (-7)^{m-2+5} = (-7)^{10} \quad (a^m \times a^n = a^{m+n})$$

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

$$\Rightarrow m + 3 = 10$$

$$\Rightarrow m = 10 - 3$$

$$\Rightarrow m = 7$$

Ans: (C) 7

22. $(2^0 + 6^{-1}) \times 6^2 =$
 $(2^0 + 6^{-1}) \times 6^2 = (1 + \frac{1}{6}) \times 36$
 $= \frac{7}{6} \times 36$
 $= 42$

Ans: (A) 42

23. $4^{\frac{7}{2}} \div 4^{\frac{3}{2}} =$
Using $\frac{a^m}{a^n} = a^{m-n}$
 $4^{\frac{7}{2}} \div 4^{\frac{3}{2}} = 4^{\frac{7}{2} - \frac{3}{2}}$
 $= 4^{\frac{4}{2}} = 4^2$
 $= 16$

Ans: (B) 16

24. $(5^{-1} - 6^{-1}) \div 3^{-1} =$
 $(5^{-1} - 6^{-1}) \div 3^{-1} = (\frac{1}{5} - \frac{1}{6}) \div \frac{1}{3}$
 $= \frac{6-5}{30} \div \frac{1}{3} = \frac{1}{30} \div \frac{1}{3}$
 $= \frac{1}{30} \times 3 = \frac{1}{10}$

Ans: (D) $\frac{1}{10}$

25. $(\frac{5}{2})^{-3} \times (\frac{3}{5})^{-1} \times (\frac{2}{3})^{-2} =$
Using $(\frac{a}{b})^{-n} = (\frac{b}{a})^n$
 $(\frac{5}{2})^{-3} \times (\frac{3}{5})^{-1} \times (\frac{2}{3})^{-2} = (\frac{2}{5})^3 \times (\frac{5}{3})^1 \times (\frac{3}{2})^2$
 $= \frac{2^3}{5^3} \times \frac{5^1}{3^1} \times \frac{3^2}{2^2}$
 $= 5^{-2} \times 2^1 \times 3^1 (a^m \times a^n = a^{m+n}, \frac{a^m}{a^n} = a^{m-n})$
 $= \frac{1}{25} \times 2 \times 3$
 $= \frac{6}{25}$

Ans: (B) $\frac{6}{25}$
