

Exponents (Level 1)

MCQ Test, Set 07

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. $\frac{4}{9} \times \frac{4}{9} =$

A. $\left(\frac{4}{9}\right)^2$

B. $\frac{4^2}{9}$

C. $\frac{8}{9}$

D. $\frac{4}{9^2}$

2. $14^3 =$

A. 2744

B. 196

C. 17

D. 42

3. Which is the largest of $4^4, 5^3, 3^5, 6^3$?

A. 3^5

B. 4^4

C. 6^3

D. 5^3

4. 324 written as a power of 18 is

A. 2^{18}

B. 18^1

C. 18^2

D. 18^3

5. $y^6 \times y^7 =$

A. y^{42}

B. y^{13}

C. $2y^{13}$

D. y^1

6. $\frac{t^{18}}{t^8} =$

A. 1

B. $t^{\frac{9}{4}}$

C. t^{26}

D. t^{10}

7. $(12^3)^4 =$

A. 48^3

B. 36^4

C. 12^{12}

D. 12^7

8. $5^3 \times 12^3 =$

A. $(17)^3$

B. $(60)^6$

C. $(60)^3$

D. $(17)^6$

9. $\frac{14^2}{6^2} =$

A. $\frac{49}{9}$

B. $\frac{7}{3}$

C. $\frac{14}{3}$

D. 64

10. $6^0 \times 6^0 =$

A. 0

B. 1

C. 2

D. 36

11. $2^{-4} =$

A. -8

B. -16

C. $\frac{1}{16}$

D. $\frac{1}{8}$

12.	$\left(\frac{1}{7}\right)^{-1} =$	A. $-\frac{1}{7}$	B. 7	C. -7	D. $\frac{1}{7}$
13.	$(-1)^{30} + (-1)^{50} =$	A. 2	B. 1	C. 0	D. -2
14.	$(-20)^3 =$	A. 60	B. -8000	C. 8000	D. -60
15.	If $3^{3x+1} = 2187$, then $x =$	A. 7	B. $\frac{8}{3}$	C. 6	D. 2
16.	If $2^{5x-4} = 64$, then $x =$	A. 2	B. 6	C. 10	D. $\frac{2}{5}$
17.	$6^{x+2} =$	A. 6^{2x}	B. 36×6^x	C. $6^x + 36$	D. 12×6^x
18.	$(7x^3)^2 =$	A. $7x^6$	B. $49x^5$	C. $14x^6$	D. $49x^6$
19.	$(a^3b^2)^2 \times (ab)^5 =$	A. a^9b^{11}	B. $a^{30}b^{20}$	C. $a^{11}b^{10}$	D. $a^{11}b^9$
20.	$2^{-1} \times 3^{-1} =$	A. $\frac{1}{36}$	B. $\frac{1}{5}$	C. $\frac{1}{6}$	D. -6
21.	If $6^{x-1} \times 6^3 = 6^8$, then $x =$	A. 6	B. -6	C. 10	D. -10
22.	$(-10)^3 + (-9)^2 =$	A. 919	B. -919	C. 1081	D. -1081
23.	$2^{\frac{5}{3}} \div 2^{\frac{11}{3}} =$	A. $2^{\frac{5}{11}}$	B. 4	C. $\frac{1}{4}$	D. $2^{\frac{16}{3}}$
24.	$125 \times \left(\frac{2}{5}\right)^3 =$	A. 150	B. 50	C. $\frac{8}{125}$	D. 8
25.	$(5^{-1} + 7^{-1} + 9^{-1})^0 =$	A. -21	B. 0	C. $\frac{143}{315}$	D. 1

Key sheet

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

Solutions

1. $\frac{4}{9} \times \frac{4}{9} =$

$\frac{4}{9}$ is multiplied by itself 2 times.

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

Ans: (A) $\left(\frac{4}{9}\right)^2$

2. $14^3 =$

$$14^3 = 14 \times 14 \times 14$$

$$= 2744$$

Ans: (A) 2744

3. Which is the largest of 4^4 , 5^3 , 3^5 , 6^3 ?

$$4^4 = 256, 5^3 = 125, 3^5 = 243, 6^3 = 216$$

The largest is 4^4 .

Ans: (B) 4^4

4. 324 written as a power of 18 is

Dividing repeatedly by 18: 324, 18, that is 2 times.

$$324 = 18^2$$

Ans: (C) 18^2

5. $y^6 \times y^7 =$

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

$$y^6 \times y^7 = y^{6+7} = y^{13}$$

Ans: (B) y^{13}

6. $\frac{t^{18}}{t^8} =$

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

$$\frac{t^{18}}{t^8} = t^{18-8} = t^{10}$$

Ans: (D) t^{10}

7. $(12^3)^4 =$

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

$$(12^3)^4 = 12^{3 \times 4} = 12^{12}$$

Ans: (C) 12^{12}

8. $5^3 \times 12^3 =$

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

$$5^3 \times 12^3 = (5 \times 12)^3 = (60)^3$$

Ans: (C) $(60)^3$

9. $\frac{14^2}{6^2} =$

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

$$\frac{14^2}{6^2} = \left(\frac{14}{6}\right)^2 = \left(\frac{7}{3}\right)^2 = \frac{49}{9}$$

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

10. $6^0 \times 6^0 =$

$$6^0 = 1$$

$$6^0 \times 6^0 = 1 \times 1 = 1$$

Ans: (B) 1

11. $2^{-4} =$

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

$$2^{-4} = \frac{1}{2^4} = \frac{1}{16}$$

Ans: (C) $\frac{1}{16}$

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

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

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

Ans: (B) 7

13. $(-1)^{30} + (-1)^{50} =$

30 is even, so $(-1)^{30} = 1$; 50 is even, so $(-1)^{50} = 1$.

$$(-1)^{30} + (-1)^{50} = 1 + 1 = 2$$

Ans: (A) 2

14. $(-20)^3 =$

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

$$(-20)^3 = -20^3 = -8000$$

Ans: (B) -8000

15. If $3^{3x+1} = 2187$, then $x =$

Given, $3^{3x+1} = 2187$

Dividing 2187 repeatedly by 3: 2187, 729, 243, 81, 27, 9, 3, so $2187 = 3^7$.

$$\Rightarrow 3^{3x+1} = 3^7$$

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

$$\Rightarrow 3x + 1 = 7$$

$$\Rightarrow 3x = 7 - 1$$

$$\Rightarrow 3x = 6$$

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

Ans: (D) 2

16. If $2^{5x-4} = 64$, then $x =$

Given, $2^{5x-4} = 64$

Dividing 64 repeatedly by 2: 64, 32, 16, 8, 4, 2, so $64 = 2^6$.

$$\Rightarrow 2^{5x-4} = 2^6$$

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

$$\Rightarrow 5x - 4 = 6$$

$$\Rightarrow 5x = 6 + 4$$

$$\Rightarrow 5x = 10$$

$$\Rightarrow x = \frac{10}{5} = 2$$

Ans: (A) 2

17. $6^{x+2} =$

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

$$6^{x+2} = 6^x \times 6^2 = 36 \times 6^x$$

Ans: (B) 36×6^x

18. $(7x^3)^2 =$

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

$$(7x^3)^2 = 7^2 \times (x^3)^2$$

$$= 49 \times x^6 = 49x^6$$

Ans: (D) $49x^6$

19. $(a^3b^2)^2 \times (ab)^5 =$

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

$$(a^3b^2)^2 \times (ab)^5 = a^6b^4 \times a^5b^5$$

Using $a^m \times a^n = a^{m+n}$; $= a^{11}b^9$

Ans: (D) $a^{11}b^9$

20. $2^{-1} \times 3^{-1} =$

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

$$2^{-1} \times 3^{-1} = (2 \times 3)^{-1} = 6^{-1}$$

$$= \frac{1}{6^1} = \frac{1}{6}$$

Ans: (C) $\frac{1}{6}$

21. If $6^{x-1} \times 6^3 = 6^8$, then $x =$

Given, $6^{x-1} \times 6^3 = 6^8$

$$\Rightarrow 6^{x-1+3} = 6^8 \quad (a^m \times a^n = a^{m+n})$$

$$\Rightarrow 6^{x+2} = 6^8$$

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

$$\Rightarrow x + 2 = 8$$

$$\Rightarrow x = 8 - 2$$

$$\Rightarrow x = 6$$

Ans: (A) 6

22. $(-10)^3 + (-9)^2 =$

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

$$(-10)^3 + (-9)^2 = -10^3 + 9^2$$

$$= -1000 + 81$$

$$= -919$$

Ans: (B) -919

23. $2^{\frac{5}{3}} \div 2^{\frac{11}{3}} =$

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

$$2^{\frac{5}{3}} \div 2^{\frac{11}{3}} = 2^{\frac{5}{3} - \frac{11}{3}}$$

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

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

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

24. $125 \times \left(\frac{2}{5}\right)^3 =$

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

$$125 \times \left(\frac{2}{5}\right)^3 = 125 \times \frac{2^3}{5^3}$$

$$= 125 \times \frac{8}{125}$$

$$= 8$$

Ans: (D) 8

25. $(5^{-1} + 7^{-1} + 9^{-1})^0 =$

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

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

Ans: (D) 1
