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Surds and Indices questions for CGL Tier 2, CGL Tier 1 and SSC 10+2

Surds and indices quiz 1

Directions: Study the following questions carefully and choose the right answer:

1. The value of $(256)^{5/4}$ is:

- A. 512
B. 984
C. 1024
D. 1032

2. The value of $\frac{1}{(216)^{-\left(\frac{2}{3}\right)}} + \frac{1}{(256)^{-\left(\frac{3}{4}\right)}} + \frac{1}{(32)^{-\left(\frac{1}{5}\right)}}$ is:

- A. 102
B. 105
C. 107
D. None of these

3. $(2.4 \times 10^3) \div (8 \times 10^{-2}) = ?$

- A. 3×10^{-5}
B. 3×10^4
C. 3×10^5
D. 30

4. $\left(\frac{1}{216}\right)^{-\left(\frac{2}{3}\right)} \div \left(\frac{1}{27}\right)^{-\left(\frac{4}{3}\right)} = ?$

- A. $3/4$
B. $2/3$
C. $4/9$
D. $1/8$

5. $(1000)^7 \div 10^{18} = ?$

- A. 10
B. 100
C. 1000
D. 10000

6. $49 \times 49 \times 49 \times 49 = 7^?$

A. 4

B. 7

C. 8

D. 16

7. The value of $(8^{-25} - 8^{-26})$ is:

A. 7×8^{-25}

B. 7×8^{-26}

C. 8×8^{-26}

E. 8×8^{-25}

8. $(64)^{-1/2} - (32)^{-4/5} = ?$

A. $1/8$

B. $3/8$

C. $1/16$

D. $3/16$

9. $(18)^{3.5} \div (27)^{3.5} \times 6^{3.5} = 2^?$

A. 3.5

B. 4.5

C. 6

D. 7

10. $\frac{(243)^{0.13} \times (243)^{0.07}}{(7)^{0.25} \times (49)^{0.075} \times (343)^{0.2}}$ is:

A. $3/7$

B. $7/3$

C. $10/7$

D. $16/7$

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Correct answers:

1	2	3	4	5	6	7	8	9	10
C	A	B	C	C	C	B	C	D	A

Explanations:

1). From the given equation:

$$(256)^{5/4}$$

$$= (4^4)^{5/4}$$

$$= 4^{(4 \times 5/4)}$$

$$= 4^5$$

$$= 1024.$$

Hence, option C is correct.

2). Given expression =

$$\frac{1}{(216)^{-2/3}} + \frac{1}{(256)^{-3/4}} + \frac{1}{(32)^{-1/5}}$$

$$= \frac{1}{6^{3 \times (-2/3)}} + \frac{1}{4^{4 \times (-3/4)}} + \frac{1}{2^{5 \times (-1/5)}}$$

$$= \frac{1}{6^{-2}} + \frac{1}{4^{-3}} + \frac{1}{2^{-1}}$$

$$= (6^2 + 4^3 + 2^1)$$

$$= (36 + 64 + 2)$$

$$= 102.$$



Hence, option A is correct.

3). Given equation

$$= (2.4 \times 10^3) \div (8 \times 10^{-2})$$

$$\text{then, } \frac{2.4 \times 10^3}{8 \times 10^{-2}}$$

$$= \frac{24 \times 10^2}{8 \times 10^{-2}}$$

$$= (3 \times 10^4)$$

Hence, option B is correct.

4). Given equation:

$$\left(\frac{1}{216}\right)^{-2/3} \div \left(\frac{1}{27}\right)^{-4/3} = ?$$

$$(216)^{(2/3)} \div (27)^{(4/3)}$$

$$= \frac{(216)^{2/3}}{(27)^{4/3}} = \frac{(6^3)^{\times(2/3)}}{(3^3)^{\times(4/3)}}$$

$$= \frac{6^2}{3^4} = \frac{36}{81} = \frac{4}{9}$$

Hence, option C is correct.

5). Given equation = $(1000)^7 \div 10^{18}$.

$$\Rightarrow \frac{(1000)^7}{(10)^{18}} \Rightarrow \frac{(10^3)^7}{(10)^{18}} \Rightarrow \frac{10^{(3 \times 7)}}{(10)^{18}}$$

$$\Rightarrow \underline{10^{21}} = 10^{(21 - 18)} \Rightarrow 10^3 = 1000.$$



$$(10)^{18}$$

Hence, option C is correct.

6). From the given equation:

$$49 \times 49 \times 49 \times 49$$

$$\Rightarrow (7^2 \times 7^2 \times 7^2 \times 7^2)$$

$$\Rightarrow 7^{(2+2+2+2)}$$

$$\Rightarrow 7^8$$

So, the correct answer is 8.

Hence, option C is correct.

7). From the given equation:

$$8^{-25} - 8^{-26}$$

$$= \left(\frac{1}{8^{25}} - \frac{1}{8^{26}} \right)$$

$$= \frac{(8 - 1)}{8^{26}}$$

$$= 7 \times 8^{-26}$$

Hence, option B is correct.

8). From the given equation:

$$(64)^{-1/2} - (32)^{-4/5}$$

$$\Rightarrow (8^2)^{-1/2} - \{(2)^5\}^{-4/5}$$

$$\Rightarrow 8^{2 \times (-1/2)} - (2)^{5 \times (-4)/5}$$

$$\Rightarrow 8^{-1} - (2)^{-4}$$

$$\Rightarrow \frac{1}{8} - \frac{1}{(2)^4}$$

$$\Rightarrow \left(\frac{1}{8} - \frac{1}{16}\right)$$

$$= \frac{1}{16}$$

Hence, option C is correct.

- 9). In this question as we need to find the power of base 2 given in R.H.S, it's clear that factors other than 2 will be cancelled out on calculation in L.H.S.

Therefore, we can solve this question just by picking 2 is as bases with their powers in L.H.S.

$$\begin{array}{ccc} (18)^{3.5} \div & (27)^{3.5} & \times 6^{3.5} = 2^x \\ \downarrow & & \downarrow \\ (2 \times 9)^{3.5} \div & (27)^{3.5} & \times (2 \times 3)^{3.5} = 2^x \\ \downarrow & \text{Neglecting bases other than 2} & \downarrow \\ (2)^{3.5} & \times & (2)^{3.5} = 2^x \end{array}$$

$$\Rightarrow 2^{3.5+3.5} = 2^x$$

$$\Rightarrow 2^7 = 2^x \Rightarrow x = 7.$$

Hence, option D is correct.

- 10). From the given equation:

$$\frac{(243)^{0.13} \times (243)^{0.07}}{7^{0.25} \times (49)^{0.075} \times (343)^{0.2}}$$

$$= \frac{(243)^{(0.13+0.07)}}{7^{0.25} \times (7^2)^{0.075} \times (7^3)^{0.2}}$$

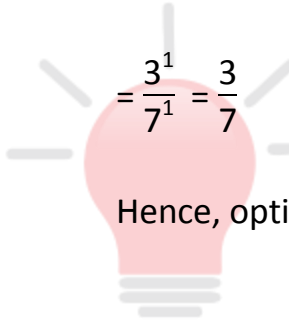
$$\frac{(243)^{0.2}}{7^{0.25} \times (7)^{(2 \times 0.075)} \times (7)^{(3 \times 0.2)}}$$

$$= 7^{0.25} \times 7^{0.15} \times 7^{0.6}$$

$$= \frac{3^{(5 \times 0.2)}}{7^{(0.25+0.15+0.6)}}$$

$$= \frac{3^1}{7^1} = \frac{3}{7}$$

Hence, option A is correct.



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