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

Direction: Study the following questions carefully and choose the right answer.

Surds and indices quiz 4

1. Given $\sqrt{2} = 1.414$ and the value of $\sqrt{8} + 2\sqrt{32} - 3\sqrt{128} + 4\sqrt{50}$ is

A. 8.484

B. 8.526

C. 8.426

D. 8.876

2. The simplified value of $(\sqrt{3} + 1)(10 + \sqrt{12})(\sqrt{12} - 2)(5 - \sqrt{3})$ is

A. 16

B. 88

C. 176

D. 132

3. If $\sqrt{15} = 3.88$, then what is the value of $\sqrt{\frac{5}{3}}$?

A. 1.293

B. 1.2934

C. 1.29

D. 1.295

4. Simplify: $\frac{(6.25)^{\frac{1}{2}} \times (0.0144)^{\frac{1}{2}} + 1}{(0.027)^{\frac{1}{3}} \times (81)^{\frac{1}{4}}}$

A. 0.14

B. 1.4

C. 1

D. 1.4

5. If $\sqrt{3} = 1.732$ is given. then the value of $\frac{2 + \sqrt{3}}{2 - \sqrt{3}} = ?$

A. 11732

B. 13.928

C. 12.928

D. 13.925

6. If $x = \frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}}$ and $y = \frac{\sqrt{5} - 3}{\sqrt{5} + \sqrt{3}}$ then $(x + y)$ equal:

A. 8

B. 16

C. 32

D. 17

7. Find the simplest value of $2\sqrt{50} + \sqrt{18} - \sqrt{72}$. $[\because \sqrt{2} = 1.414]$

A. 4.242

B. 9.898

C. 10.312

D. 8.484

8. $(8)^{0.75} \times (4096)^{0.25} \div (64)^{-1} = (8)^?$

A. 2.25

B. 3.0

C. 3.25

D. 3.75

9. $(6561)^{-25} \div 0.05 = ?$

A. 19

B. 90

C. 180

D. 0.45

10. 3.6 of 4.8 of $\frac{1}{10}$. 8 of 1155 = ?

A. 1242

B. 1308

C. 1512

D. 1848

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Correct answers:

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

Explanations:

1). $\sqrt{8} + 2\sqrt{32} - 3\sqrt{128} + 4\sqrt{50}$

$$= 2\sqrt{2} + 8\sqrt{2} - 3 \times 8\sqrt{2} + 4 \times 5\sqrt{2}$$
$$= (2 + 8 - 24 + 20)\sqrt{2}$$
$$= 6\sqrt{2} = 6 \times 1.414 = 8.484$$

Hence, option A is correct.

2). Expression = $(\sqrt{3} + 1)(10 + \sqrt{12})(\sqrt{12} - 2)(5 - \sqrt{3})$

$$= (\sqrt{3} + 1)(10 + 2\sqrt{3})(2\sqrt{3} - 2)(5 - \sqrt{3})$$
$$= (\sqrt{3} + 1) \times 2(5 + \sqrt{3}) \times 2(\sqrt{3} - 1)(5 - \sqrt{3})$$
$$= 4(\sqrt{3} + 1)(\sqrt{3} - 1)(5 - \sqrt{3})(5 + \sqrt{3})$$
$$= 4(3 - 1)(25 - 3)$$
$$[(a + b)(a - b) = a^2 - b^2]$$
$$= 4 \times 2 \times 22 = 176.$$

Hence, option C is correct.

3). Given, $\sqrt{15} = 3.88$

$$\text{Now, } \sqrt{\frac{5}{3}} = \sqrt{\frac{5 \times 3}{3 \times 3}} = \sqrt{\frac{15}{3}}$$

$$= \frac{3.88}{3} = 1.29\bar{3}$$

Hence, option A is correct.

4). Expression:

$$\begin{aligned} & \frac{(6.25)^{1/2} \times (0.0144)^{1/2} + 1}{(0.027)^{1/3} \times (81)^{1/4}} \\ &= \frac{(2.5)^{2 \times (1/2)} \times (0.12)^{2 \times (1/2)} + 1}{(0.3)^{3 \times (1/3)} \times (3)^{4 \times (1/4)}} \\ &= \frac{2.5 \times 0.12 + 1}{(0.3) \times (3)} = \frac{0.3 + 1}{0.9} \\ &= \frac{1.3}{0.9} = 1.4444 = 1.\bar{4} \end{aligned}$$

Hence option D is correct.

5). Given expression = $\frac{2+\sqrt{3}}{2-\sqrt{3}}$

$$= \frac{(2 + \sqrt{3})(2 + \sqrt{3})}{(2 - \sqrt{3})(2 + \sqrt{3})}$$

[On rationalising the denominator]

$$\begin{aligned} &= \frac{(2 + \sqrt{3})^2}{4 - 3} = (2 + \sqrt{3})^2 \\ &= 2^2 + (\sqrt{3})^2 + 2 \times 2 \times \sqrt{3} \\ &= 4 + 3 + 4\sqrt{3} \\ &= 7 + 4 \times 1.732 \end{aligned}$$

$$= 7 + 6.928 = 13.928$$

Hence, option B is correct.

6). If $x = \frac{(\sqrt{5}+\sqrt{3})}{\sqrt{5}-\sqrt{3}}$

$$= \frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} \times \frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} + \sqrt{3}}$$

$$= \frac{(\sqrt{5} + \sqrt{3})^2}{\sqrt{5} - \sqrt{3}} = \frac{5 + 3 + 2\sqrt{15}}{5 - 3}$$

$$= \frac{5 + 3 + 2\sqrt{15}}{2}$$

$$= \frac{8 + 2\sqrt{15}}{2} = 4 + \sqrt{15}$$

$$\therefore y = \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}} = 4 - \sqrt{15}$$

$$\therefore x + y = 4 + \sqrt{15} + 4 - \sqrt{15} = 8$$

Hence, option A is correct.

7). $2\sqrt{50} + \sqrt{18} - \sqrt{72}$

$$= 2\sqrt{2 \times 5 \times 5} + \sqrt{3 \times 3 \times 2} - \sqrt{2 \times 2 \times 2 \times 3 \times 3}$$

$$= 10\sqrt{2} + 3\sqrt{2} - 6\sqrt{2}$$

$$= (10 + 3 - 6) \times 1.414$$

$$= 7 \times 1.414 = 9.898.$$

Hence, option B is correct.

8). $(8)^{0.75} \times (4096)^{0.25} \div (64)^{-1} = (8)^?$

$$\Rightarrow (8)^{0.75} \times (8^4)^{1/4} \times (8)^2 = (8)^?$$

$$\Rightarrow (8)^{0.75 + 1 + 2} = (8)^?$$

$$\Rightarrow (8)^{3.75} = (8)^?$$

$$\Rightarrow ? = 3.75$$

Hence, option D is correct.

9). $(6561)^{.25} \div 0.05 = ?$

$$\Rightarrow (6561)^{1/4} \div 0.05$$

$$\Rightarrow (9^4)^{1/4} \div 0.05 \Rightarrow 9 \div 0.05 = 180$$

Hence, option C is correct.

10). 3.6 of 4.8 of $\frac{1}{10.8}$ of 1155 = ?

$$\Rightarrow \frac{36}{10} \times \frac{48}{10} \times \frac{10}{108} \times 1155 = 1848$$

Hence, option D is correct.

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