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

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, √15 = 3.88

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

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

Hence, option A is correct.

4). Expression:

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

$$= \frac{(2.5)^{2\times(1/2)} \times (0.12)^{2\times(1/2)} + 1}{(0.3)^{3\times1/3} \times (3)^{4\times(1/4)}}$$

$$= \frac{2.5 \times 0.12 + 1}{(0.3) \times (3)} = \frac{0.3 + 1}{0.9}$$

$$= \frac{1.3}{0.9} = 1.4444 = 1.\overline{4}$$

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]

$$= \frac{(2+\sqrt{3})^2}{4-3} = (2+\sqrt{3})^2$$

$$= 2^2 + (\sqrt{3})^2 + 2 \times 2 \times \sqrt{3}$$

$$= 4 + 3 + 4\sqrt{3}$$

$$= 7 + 4 \times 1.732$$

= 7 + 6.928 = 13.928

Hence, option B is correct.

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

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

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

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

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

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

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

Hence, option A is correct.

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

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

$$= 10\,2 + 3\,2 - 6\,2$$

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

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

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.