



gradeup

Sahi Prep Hai Toh Life Set Hai

SIMPLIFICATION

BODMAS

B → Bracket
O → Of (order) <i>Powers / Roots</i>
D → Division \div
M → Multiplication \times
A → Addition $+$
S → Subtraction $-$

Bracket
— (Line / Bar)
() (Small)
{ } (Curly)
[] (Long)

eg

$$2 + 2 \div 2$$

$$2 + 1$$

$$= 3$$

eg

$$(2 + 2) \div 2$$

$$4 \div 2$$

$$= 2$$

Q1. $1 + 1 \div \{1 + 1 \div (\overline{1-1} + 2)\} = 0$

(a) $1\frac{1}{3}$

(b) 1

(c) $1\frac{2}{7}$

(d) $1\frac{2}{3}$

—

()

{ }

[]

$$1 + 1 \div \{1 + 1 \div (2)\}$$

$$1 + 1 \div \{1 + \frac{1}{2}\}$$

$$1 + 1 \div \frac{3}{2}$$

$$1 + \frac{2}{3}$$

$$= 1\frac{2}{3} \quad \checkmark$$

Ans. (d)

Q2. The simplified value of $\left(3\frac{7}{6} \text{ of } 2\frac{1}{5} \div \frac{4}{3}\right) \div 2\frac{4}{9} \text{ of } \left(\frac{7}{3} \div 1\frac{1}{6} \times 2\frac{2}{3} \text{ of } \frac{3}{4}\right)$ is:

☒ (a) $\frac{45}{64}$

(c) $\frac{55}{8}$

(b) $\frac{-36}{7}$

(d) $\frac{9}{22}$

~~$\frac{25}{5} \times \frac{11}{4}$~~

O (order)
↓

Power / Root

$$\left(\frac{25}{6} \text{ of } \frac{11}{5} \div \frac{4}{3}\right) \div \frac{22}{9} \text{ of } \left(\frac{7}{3} \div \frac{7}{6} \times \frac{8}{3} \text{ of } \frac{3}{4}\right)$$

$$\left(\frac{55}{6} \div \frac{4}{3}\right) \div \frac{22}{9} \text{ of } \left(\frac{7}{3} \div \frac{7}{6} \times 2\right)$$

$$\frac{55}{8} \div \frac{22}{9} \text{ of } 4$$

$$\frac{55}{8} \div \frac{88}{9} = \frac{55}{8} \times \frac{9}{88}$$

Ans. (a)

EXPONENTS

$$x^a \cdot x^b = x^{a+b}$$

$$Eg. 2^7 \cdot 2^5 = 2^{12}$$

$$\frac{x^a}{x^b} = x^{a-b}$$

$$Eg. \frac{2^{11}}{2^4} = 2^7$$

$$(x^a)^b = x^{a \cdot b}$$

$$Eg. (2^3)^4 = 2^{12}$$

$$(x)^0 = 1$$

$$Eg. 2^0 = 1$$

$$x^{-m} = \frac{1}{x^m}$$

$$Eg. 2^{-3} = \frac{1}{2^3}$$

$$* \quad \left(2^3\right)^4 = 2^{12} \quad \left(2^4\right)^3 = 2^{12}$$

$$2^{3^4} = 2^{81} \quad 2^{4^3} = 2^{64}$$

$$5^{3^2} = 5^9 \quad 5^{2^3} = 5^8$$

$$2^{4^3} \rightarrow 2^{4^8} \Rightarrow 2^{65536}$$

Q3. Find the value of K.

$$2^{3^4} \div 2^{4^3} \times (2^3)^4 = 8^K$$

$$2^{81} \div 2^{64} \times 2^{12}$$

$$2^{17} \times 2^{12} = (2^3)^K$$

$$2^{29} = 2^{3K}$$

$$K = \frac{29}{3}$$

Ans. 29/3

Q4. Find the value of $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{25}{9}\right)^{-\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3} \right]$

$$\rightarrow \left(\frac{3^4}{2^4}\right)^{-\frac{3}{4}} \times \left[\left(\frac{5}{3}\right)^{2 \times -\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3} \right]$$

$$\left(\frac{3}{2}\right)^{-3} \times \left[\left(\frac{5}{3}\right)^{-3} \div \left(\frac{5}{2}\right)^{-3} \right]$$

$$\left(\frac{2}{3}\right)^3 \times \left[\left(\frac{3}{5}\right)^3 \div \left(\frac{2}{5}\right)^3 \right]$$

$$\left(\frac{2}{3}\right)^3 \times \left(\frac{3}{5}\right)^3 \times \left(\frac{5}{2}\right)^3 = 1$$

Ans : 1

Q5. If $\frac{9^n \times 3^2 \times \left(3^{\frac{-n}{2}}\right)^{-2} - (27)^n}{3^{3m} \times 2^3} = \frac{1}{27},$

then find the value of $m - n$.

$$\frac{3^{2n} \cdot 3^2 \cdot 3^n - 3^{3n}}{3^{3m} \cdot 2^3}$$

\Rightarrow

$$\frac{3^{3n+2} - 3^{3n}}{3^{3m} \cdot 2^3} = \frac{1}{27}$$

\neq

$$3n - 3m = -3$$

$$\boxed{m - n = 1}$$

$$\frac{3^{3n} \left(\cancel{3^2} - 1 \right)}{3^{3m} \cdot \cancel{2^3}} = \frac{1}{3^3}$$

$$3^{3n-3m} = 3^{-3}$$

\neq

Ans : 1

Q6. If $4^x - 4^{x-1} = 24$, then the value of $(2x)^x$ is:

a $5\sqrt{5}$

(b) $\sqrt{5}$

(c) $25\sqrt{5}$

(d) 125

$$4^x - 4^{x-1} = 24$$

$$4^x - \frac{4^x}{4^1} = 24$$

Let $4^x = k$

$$k - \frac{k}{4} = 24$$

$$\boxed{k = 32}$$

$$4^x = 32$$

$$2^{2x} = 2^5$$

$$2x = 5$$

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

$$(5)^{5/2}$$

$$5^{2\frac{1}{2}}$$

$$5^2 \cdot 5^{1/2}$$

$$\underline{\underline{25\sqrt{5}}}$$

Ans : (c)

Q7. Find the value of m if $\left[\left\{ \left(\frac{1}{7^2} \right)^{-2} \right\}^{\frac{1}{3}} \right]^{\frac{1}{4}} = 7^m$

☒ (a) $-\frac{1}{3}$

(b) $\frac{1}{4}$

(c) -3

(d) 2

$$7^{-2 \times 2 \times -\frac{1}{3} \times \frac{1}{4}} = 7^m$$

$$m = -\frac{1}{3}$$

Ans : (a)

RATIONALIZATION

$$\frac{1}{a+\sqrt{b}} \times \frac{a-\sqrt{b}}{a-\sqrt{b}} = \frac{a-b}{a^2-b}$$

$$\text{Eg. } \frac{1}{3+\sqrt{5}} = ??$$

$$\frac{1}{3+\sqrt{5}} \times \frac{3-\sqrt{5}}{3-\sqrt{5}} = \frac{3-\sqrt{5}}{4} \checkmark$$

$$\text{Eg. } \frac{1}{5-3\sqrt{2}} = ??$$

$$\frac{1}{5-3\sqrt{2}} \times \frac{5+3\sqrt{2}}{5+3\sqrt{2}} = \frac{5+3\sqrt{2}}{7}$$

Q8. $\frac{1}{\sqrt{2} + \sqrt{1}} + \frac{1}{\sqrt{3} + \sqrt{2}} + \frac{1}{\sqrt{4} + \sqrt{3}} + \dots + \frac{1}{\sqrt{50} + \sqrt{49}} = ??$

$$\frac{\sqrt{2}-\sqrt{1}}{1} + \frac{\sqrt{3}-\sqrt{2}}{1} + \frac{\sqrt{4}-\sqrt{3}}{1} + \dots + \frac{\sqrt{50}-\sqrt{49}}{1}$$

$$\cancel{\frac{(\sqrt{2}-\sqrt{1})}{1}} + \cancel{(\sqrt{3}-\sqrt{2})} + \cancel{(\sqrt{4}-\sqrt{3})} + \dots + \cancel{(\sqrt{50}-\sqrt{49})}$$

$$\underline{\underline{\sqrt{50} - 1}} \quad \checkmark$$

Ans. $\sqrt{50} - 1$

Q9. If a and b are rational numbers then find the value of a and b.

$$\frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}} = a + b\sqrt{3}$$

$$\frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}} \times \frac{7 - 4\sqrt{3}}{7 - 4\sqrt{3}}$$

$$= \frac{35 - 20\sqrt{3} + 14\sqrt{3} - 24}{49 - 48}$$

$$11 - 6\sqrt{3}$$

$$= a + b\sqrt{3}$$

$$a = 11$$

$$b = -6$$

Ans : $a = 11$, $b = -6$

$$\frac{12}{(3+\sqrt{5})+(2\sqrt{2})} \times \frac{(3+\sqrt{5})-2\sqrt{2}}{(3+\sqrt{5})-2\sqrt{2}}$$

$$\rightarrow \frac{12(3+\sqrt{5}-2\sqrt{2})}{(3+\sqrt{5})^2 - (2\sqrt{2})^2}$$

$$\rightarrow \frac{12(3+\sqrt{5}-2\sqrt{2})}{14+6\sqrt{5}-8}$$

$$\rightarrow \frac{212(3+\sqrt{5}-2\sqrt{2})}{4(\sqrt{5}+1)}$$

Q10. $\frac{12}{3+\sqrt{5}+2\sqrt{2}}$ is equal to

(a) $1-\sqrt{5}+\sqrt{2}+\sqrt{10}$

☒ (b) $1+\sqrt{5}+\sqrt{2}-\sqrt{10}$

(c) $1+\sqrt{5}-\sqrt{2}+\sqrt{10}$

(d) $1-\sqrt{5}-\sqrt{2}+\sqrt{10}$

$$\frac{2(3+\sqrt{5}-2\sqrt{2})}{\sqrt{5}+1} \times \frac{\sqrt{5}-1}{\sqrt{5}-1}$$

$$\Rightarrow \frac{2[3\sqrt{5}-3+5-\sqrt{5}-2\sqrt{10}+2\sqrt{2}]}{4}$$

$$\Rightarrow \frac{2\sqrt{5}-2\sqrt{10}+2\sqrt{2}+2}{2}$$

Ans. (b)

Q11. Find the value of $\sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}}$

Detailed

$$x = \sqrt{12 + x}$$

$$x^2 = 12 + x$$

$$x^2 - x - 12 = 0$$

$$(x-4)(x+3) = 0$$

$$\boxed{x=4} \quad \cancel{x=-3}$$

Ans. 4

If $y = \sqrt{a + \sqrt{a + \sqrt{a + \dots}}}$

$$a = n(n+1)$$

$$y = \underline{\underline{n+1}}$$

eg

$$y = \sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}}$$

$$12 = 3 \cdot (4)$$

$$\underline{\text{Ans} = 4}$$

eg

$$y = \sqrt{42 + \sqrt{42 + \sqrt{42 + \dots}}}$$

$$\rightarrow (7) \checkmark$$

Q12. Find the value of $\sqrt{30 - \sqrt{30 - \sqrt{30 - \dots}}}$

Detailed

$$y = \sqrt{30 - y}$$

$$y^2 = 30 - y$$

$$y^2 + y - 30 = 0$$

$$\cancel{y = -6}$$

$$\underline{\underline{y = 5}}$$

Ans. 5

If $y = \sqrt{a - \sqrt{a - \sqrt{a - \dots}}}$

$$a = n(n+1)$$

$$y = n$$

eg

$$A = \sqrt{20 - \sqrt{20 - \sqrt{20 - \dots}}}$$

$$= \textcircled{4}$$

Q13. Find the value of $\sqrt{10 + \sqrt{10 + \sqrt{10 + \dots}}}$

$$y = \sqrt{10 + y}$$

$$y^2 = 10 + y$$

$$y^2 - y - 10 = 0$$

$$y = \frac{1 \pm \sqrt{41}}{2}$$

$$= \frac{1 + \sqrt{41}}{2}$$

$$\underline{\underline{\sqrt{36} = 6}}$$

Ans. $\frac{1 + \sqrt{41}}{2}$

$$\text{If } y = \sqrt{a + \sqrt{a + \sqrt{a + \dots}}}$$

$$\underline{\underline{a > 0}}$$

$$y = \frac{1 + \sqrt{1 + 4a}}{2}$$

eg $y = \sqrt{19 + \sqrt{19 + \sqrt{19 + \dots}}}$

$$y = \frac{1 + \sqrt{77}}{2}$$

Q14. Find the value of $\sqrt{17 - \sqrt{17 - \sqrt{17 - \dots}}}$

$$y = \sqrt{17 - y}$$

$$y^2 = 17 - y$$

$$y^2 + y - 17 = 0$$

$$y = \frac{-1 \pm \sqrt{69}}{2}$$

$$y = \frac{-1 + \sqrt{69}}{2}$$

Ans. $\frac{-1 + \sqrt{69}}{2}$

If $y = \sqrt{a - \sqrt{a - \sqrt{a - \dots}}}$

$$y = \frac{-1 + \sqrt{1 + 4a}}{2}$$

eg

$$y = \sqrt{15 - \sqrt{15 - \sqrt{15 - \dots}}}$$

$$y = \frac{-1 + \sqrt{61}}{2} \quad \checkmark$$

Q15. Find the value of

$$\sqrt{63 + 2\sqrt{\underline{63} + 2\sqrt{63 + 2\sqrt{63 + \dots??}}}}$$

$$Y = \sqrt{63 + 2Y}$$

$$Y^2 = 63 + 2Y$$

$$Y^2 - 2Y - 63 = 0$$

$$Y = 9, \quad \underline{\underline{9}}$$

Ans. 9

Q16. Find the value of $\sqrt{7\sqrt{7\sqrt{7}\dots\dots}}$

$$y = \sqrt{7y}$$

$$y^2 = 7y$$

$$y^2 - 7y = 0$$

$$y(y-7) = 0$$

~~420~~ 87

Ans. 7

II nd

$$Y = \sqrt{5\sqrt{5\sqrt{5\sqrt{5}}}}$$

$$= \sqrt{5\sqrt{5\sqrt{5 \cdot 5^{1/2}}}}$$

$$= \sqrt{5\sqrt{5 \cdot 5^{3/4}}}$$

$$= \sqrt{5 \cdot 5^{7/8}}$$

$$= \sqrt{5^{15/8}}$$

Q17. Find the value of $\sqrt{5\sqrt{5\sqrt{5\sqrt{5}}}}$

^{8th}

$$Y = \sqrt{5\sqrt{5\sqrt{5\sqrt{5}}}}$$

$$Y^2 = 5\sqrt{5\sqrt{5\sqrt{5}}}$$

$$Y^4 = 5^2 5\sqrt{5\sqrt{5}}$$

$$Y^8 = 5^6 5\sqrt{5}$$

$$Y^{16} = 5^{14} \cdot 5$$

$$Y^{16} = 5^{15}$$

$$Y = 5^{15/16}$$

Ans. $\frac{15}{16}$

Q18. Find the value of $\sqrt{2\sqrt[3]{4}\sqrt{2\sqrt[3]{4}\sqrt{2\sqrt[3]{4}\dots\dots\dots}}}$

$$X = \sqrt{2^3 \sqrt{4} x}$$

$$x^2 = 2\sqrt[3]{4x}$$

$$x^6 = 2^3 \cdot 4x$$

$$x^6 = 32$$

$$x^5 = 32$$

$$\boxed{x = 21}$$

Ans. 2

Q19. Arrange the numbers in ascending order:

$$\sqrt{17} + \sqrt{13}, \sqrt{11} + \sqrt{19}, \sqrt{23} + \sqrt{7}$$

(A) (B) (C)

Concept → All the no have + sign in b/w
 & their sum is also same

$$\cancel{17} + \cancel{13} + 2\sqrt{\cancel{17}\cancel{13}}$$

$$(221)$$

$$\cancel{11} + \cancel{19} + 2\sqrt{\cancel{11}\cancel{19}}$$

$$(209)$$

$$\cancel{23} + \cancel{7} + 2\sqrt{\cancel{23}\cancel{7}}$$

$$(161)$$

$$C < B < A$$

Ans. $\sqrt{23} + \sqrt{7}, < \sqrt{11} + \sqrt{19}, < \sqrt{17} + \sqrt{13}$

Shortcut

A $\sqrt{11} + \sqrt{19}$

B $\sqrt{17} + \sqrt{13}$

C $\sqrt{23} + \sqrt{7}$

① check

+

sum → same

$C < A < B$

eg

$$A = \sqrt{38} + \sqrt{62}$$

$$B = \sqrt{41} + \sqrt{59}$$

$$C = \sqrt{71} + \sqrt{29}$$

$$D = \sqrt{63} + \sqrt{37}$$

Arrange the numbers in ascending order

$$C < D < A < B$$

Q20. Arrange the numbers in ascending order:

$$\sqrt{15} - \sqrt{8}, \sqrt{19} - \sqrt{12}, \sqrt{17} - \sqrt{10}$$

Shortcut

A $\sqrt{15} - \sqrt{8}$

B $\sqrt{19} - \sqrt{12}$

C $\sqrt{17} - \sqrt{10}$

$$B < C < A$$

~~Concept~~

$$\sqrt{15} - \sqrt{8} \times \frac{\sqrt{15} + \sqrt{8}}{\sqrt{15} + \sqrt{8}} = \frac{7}{\sqrt{15} + \sqrt{8}}$$

A $\frac{7}{\sqrt{15} + \sqrt{8}}$

B $\frac{7}{\sqrt{19} + \sqrt{12}}$

C $\frac{7}{\sqrt{17} + \sqrt{10}}$

$$B < C < A$$

Ans. $\sqrt{19} - \sqrt{12} < \sqrt{17} - \sqrt{10} < \sqrt{15} - \sqrt{8}$

eg

Arrange the
no in
ascending
order

$$A \quad \sqrt{7} - \sqrt{4}$$

$$B \quad \sqrt{8} - \sqrt{5}$$

$$C \quad \sqrt{9} - \sqrt{6}$$

$$D \quad \sqrt{6} - \sqrt{3}$$

$$C < B < A < D$$

Q21. Arrange the numbers in ascending order:

$$\overset{A}{\sqrt{2}}, \overset{B}{\sqrt[3]{3}}, \overset{C}{\sqrt[6]{6}}$$

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

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

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

Multiply all powers by 6

$$2^3$$

$$3^2$$

$$6^1$$

$$8$$

$$9$$

$$6$$

$$C < A < B$$

Ans. $\sqrt[6]{6} < \sqrt[3]{3} < \sqrt{2}$

Q22. If the numbers $\overset{A}{\sqrt[3]{9}}$, $\overset{B}{\sqrt[4]{20}}$, $\overset{C}{\sqrt[6]{25}}$ are arranged in ascending order, then the right arrangement is

$$9^{1/3} \quad 20^{1/4} \quad 25^{1/6}$$

$$9^4, 20^3, 25^2$$

$$6561, 8000, 625$$

$$C < A < B$$

(a) $\sqrt[6]{25} < \sqrt[4]{20} < \sqrt[3]{9}$

(b) $\sqrt[3]{9} < \sqrt[4]{20} < \sqrt[6]{25}$

(c) $\sqrt[4]{20} < \sqrt[6]{25} < \sqrt[3]{9}$

(d) $\sqrt[6]{25} < \sqrt[3]{9} < \sqrt[4]{20}$

Q23. Arrange the numbers in ascending order:

$$\begin{matrix} A & B & C & D \\ 5^{120}, & 7^{96}, & 11^{72}, & 35^{48} \end{matrix}$$

HCF of 120, 96, 72
48

→ (24)

$$5^{\frac{120}{24}}, \quad 7^{\frac{96}{24}}, \quad 11^{\frac{72}{24}}, \quad 35^{\frac{48}{24}}$$

Divide all power by 24

$$5^5, \quad 7^4, \quad 11^3, \quad 35^2$$

$$3125, \quad 2401, \quad 1331, \quad 1225$$

$$D < C < B < A$$

Ans. $35^{48} < 11^{72} < 7^{96} < 5^{120}$

Q24. The value of $999\frac{995}{999} \times 999$ is

(a) 990809

(c) 999824

☒ (b) 998996

(d) 998999

$$\left(\underline{\underline{999}} + \frac{995}{999} \right) \times \underline{\underline{999}}$$

$$\underline{\underline{999}} \times \underline{\underline{999}} + 995$$

$$999(1000-1) + 995$$

$$999000 - 999$$

$$\underline{\underline{998996}}$$

Q25. $\underline{999}\frac{1}{7} + \underline{999}\frac{2}{7} + \underline{999}\frac{3}{7} + \underline{999}\frac{4}{7} + \underline{999}\frac{5}{7} + \underline{999}\frac{6}{7}$ is simplified to :

(a) 5997

(b) 5979

(c) 5994

(d) 2997

$$999 \times 6 + \left(\frac{1}{7} + \frac{2}{7} + \frac{2}{7} + \frac{4}{7} + \frac{5}{7} + \frac{6}{7} \right)$$

$$5994 + 3$$

$$= \underline{\underline{5997}}$$

Q26. The value of $4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$ is

(a) $\frac{1}{8}$

(b) $\frac{1}{64}$

(c) $\frac{1}{16}$

(d) $\frac{1}{32}$

Q27. The value of $(11111)^2$ is

(a) 12344321

(b) 121212121

(c) 123454321

(d) 11344311

Q28. 12345679×72 is equal to :

(a) 88888888

(b) 999999998

(c) 888888888

(d) 898989898

Q29. If $\frac{37}{13} = 2 + \frac{1}{x + \frac{1}{y + \frac{1}{z}}}$,

where x, y, z are natural numbers, then

x, y, z are:

(a) 1, 2, 5

(b) 1, 5, 2

(c) 5, 2, 11

(d) 11, 2, 5

Ans. (b)

SQUARE ROOT OF IRRATIONAL NUMBERS

$$\text{Eg. } \sqrt{7 + 4\sqrt{3}} = ??$$

$$\text{Eg. } \sqrt{37 + 20\sqrt{3}} = ??$$

$$\text{Eg. } \sqrt{33 - 20\sqrt{2}} = ??$$

Q30. If $M = \sqrt{3 - \sqrt{5}} + \sqrt{9 - 4\sqrt{5}}$
and $N = \sqrt{\sqrt{7} - 1} - \sqrt{11 - 4\sqrt{7}}$

What is the value of $\frac{M - N}{M + N}$?

(a) 0

(b) 1

(c) -1

(d) None of these

Ans. (b)

Note :

$$\sqrt{2 + \sqrt{3}} = \frac{\sqrt{3} + 1}{\sqrt{2}}$$

$$\sqrt{2 - \sqrt{3}} = \frac{\sqrt{3} - 1}{\sqrt{2}}$$

PRACTICE QUESTIONS

Q1. $\sqrt{1 + \sqrt{1 + \sqrt{1 + \dots}}}$

- (a) equals 1
- (b) lies between 0 and 1
- (c) lies between 1 and 2
- (d) is greater than 2

Ans. (c)

Q2. If $m = \sqrt{5 + \sqrt{5 + \sqrt{5 + \dots}}}$ and $n = \sqrt{5 - \sqrt{5 - \sqrt{5 - \dots}}}$, then among the following the relation between m and n holds is

(a) $m - n + 1 = 0$

(b) $m + n - 1 = 0$

(c) $m + n + 1 = 0$

(d) $m - n - 1 = 0$

Ans. (d)

Q3. Find the value of $\sqrt{63 - 2\sqrt{63 - 2\sqrt{63 - 2\sqrt{63 - \dots}}}}$??

Ans. 7

Q4. The value of $\frac{1}{\sqrt{(12-\sqrt{140})}} - \frac{1}{\sqrt{(8-\sqrt{60})}} - \frac{2}{\sqrt{10+\sqrt{84}}}$ is :

(a) 0 (b) 1 (c) 2 (d) 3

Ans. ()

Q5. If $x = 5 - \sqrt{21}$, then the value of $\frac{\sqrt{x}}{\sqrt{32-2x} - \sqrt{21}}$

(a) $\frac{1}{\sqrt{2}}(\sqrt{3} - \sqrt{7})$ (b) $\frac{1}{\sqrt{2}}(\sqrt{7} - \sqrt{3})$

(c) $\frac{1}{\sqrt{2}}(\sqrt{7} + \sqrt{3})$ (d) $\frac{1}{\sqrt{2}}(7 - \sqrt{3})$

Ans. ()

Q6. Find the value of $\frac{1}{5} + 999\frac{494}{495} \times 99$

(a) 90000

(b) 99000

(c) 90900

(d) 99990

Ans. ()

Q7. $\left(999\frac{999}{1000} \times 7\right)$ is equal to:

(a) $6993\frac{7}{1000}$

(b) $7000\frac{7}{1000}$

(c) $6633\frac{7}{1000}$

(d) $6999\frac{993}{1000}$

Ans. ()

Q8. The value of $1 - \frac{a}{1 - \frac{1}{1 + \frac{a}{1 - a}}}$ is

(a) a

(b) $1 - a$

(c) 1

(d) 0

Ans. ()

Q9. The smallest of $\sqrt{8} + \sqrt{5}$, $\sqrt{7} + \sqrt{6}$, $\sqrt{10} + \sqrt{3}$ and

$\sqrt{11} + \sqrt{2}$ is :

(a) $\sqrt{8} + \sqrt{5}$

(b) $\sqrt{7} + \sqrt{6}$

(c) $\sqrt{10} + \sqrt{3}$

(d) $\sqrt{11} + \sqrt{2}$

Ans. ()

Q10. The greatest among $\sqrt{7} - \sqrt{5}$, $\sqrt{5} - \sqrt{3}$, $\sqrt{9} - \sqrt{7}$, $\sqrt{11} - \sqrt{9}$ is

(a) $\sqrt{7} - \sqrt{5}$

(b) $\sqrt{5} - \sqrt{3}$

(c) $\sqrt{9} - \sqrt{7}$

(d) $\sqrt{11} - \sqrt{9}$

Ans. ()

Q11. The smallest among the numbers 2^{250} , 3^{150} , 5^{100} and 4^{200}

(a) 4^{200}

(b) 5^{100}

(c) 3^{150}

(d) 2^{250}

Ans. ()

Q12. Arranging the following in ascending order 3^{34} , 2^{51} , 7^{17} we get

(a) $3^{34} > 2^{51} > 7^{17}$

(b) $7^{17} > 2^{51} > 3^{34}$

(c) $3^{34} > 7^{17} > 2^{51}$

(d) $2^{51} > 3^{34} > 7^{17}$

Ans. ()

Q13. The simplified value of :

$$\left\{ \left(1 + \frac{1}{10 + \frac{1}{10}} \right) \left(1 + \frac{1}{10 + \frac{1}{10}} \right) - \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \right\} \div \left\{ \left(1 + \frac{1}{10 + \frac{1}{10}} \right) \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \right\}$$

(a) $\frac{4040}{10101}$

(b) $\frac{100}{101}$

(c) 2

(d) $\frac{90}{101}$

Ans. ()

Q14. The ascending order of

$(2.89)^{0.5}$, $2 - (0.5)^2$, $\sqrt{3}$ and $\sqrt[3]{0.008}$ is

- (a) $2 - (0.5)^2$, $\sqrt{3}$, $\sqrt[3]{0.008}$, $(2.89)^{0.5}$
- (b) $\sqrt[3]{0.008}$, $(2.89)^{0.5}$, $\sqrt{3}$, $2 - (0.5)^2$
- (c) $\sqrt[3]{0.008}$, $\sqrt{3}$, $(2.89)^{0.5}$, $2 - (0.5)^2$
- (d) $\sqrt{3}$, $\sqrt[3]{0.008}$, $2 - (0.5)^2$, $(2.89)^{0.5}$

Ans. ()

Q15. What is the value of :

$$\left[\frac{1}{\sqrt{9} - \sqrt{8}} \right] - \left[\frac{1}{\sqrt{8} - \sqrt{7}} \right] + \left[\frac{1}{\sqrt{7} - \sqrt{6}} \right] - \left[\frac{1}{\sqrt{6} - \sqrt{5}} \right] + \left[\frac{1}{\sqrt{5} - \sqrt{4}} \right]$$

(a) 6

(b) 5

(c) -7

(d) -1

Ans. (b)

Q16. If $\frac{97}{19} = a + \frac{1}{b + \frac{1}{c}}$,

where a , b and c are positive integers, then what is the sum of a , b and c ?

(a) 16

(b) 9

(c) 20

(d) 18

Ans. (a)

Q17. Find the value of expression of :

$$\frac{4^n \times 20^{m-1} \times 12^{m-n} \times 15^{m+n-2}}{16^m \times 5^{2m+n} \times 9^{m-1}}$$

(a) 500

(b) 1

(c) 200

(d) 1/500

Ans. (d)

Q18. Find the square root of $7 + \sqrt{48}$

a $2 - \sqrt{3}$

b $2 + \sqrt{3}$

c $3 + \sqrt{2}$

d $3 - \sqrt{2}$

Ans. (b)

Q19. If $\sqrt{6} = 2.449$, then the value of

$$\frac{\sqrt{6}}{2} - \frac{12}{\sqrt{6}} + \sqrt{216} \text{ is equal to:}$$

(a) 11.021

(b) 12.067

(c) 13.079

(d) 12.187

Ans. (a)

Q20. Find the value of:

$$\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right) \dots \left(1 - \frac{1}{100}\right)$$

a $\frac{1}{5}$

b $\frac{1}{10}$

c $\frac{1}{50}$

d $\frac{2}{5}$

Ans. (c)



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