Simplification
(Previous Year Questions)

Simplification (CPO-2020)

1. The value of $8 - 3 \div 6$ of $2 + \left(4 \div 4 \text{ of } \frac{1}{4}\right) \div 8 + \left(4 \times 8 \div \frac{1}{4}\right) \times \frac{1}{8}$ is :

$8 - 3 \div 6 \text{ of } 2 + \left(4 \div 4 \text{ of } \frac{1}{4}\right) \div 8 + \left(4 \times 8 \div \frac{1}{4}\right) \times \frac{1}{8}$ का मान ज्ञात करें।

(A) $-\frac{7}{4}$ (B) $\frac{7}{4}$ (C) $-\frac{97}{4}$ (D) $\frac{97}{4}$

2. The value of $\frac{6.35 \times 6.35 \times 6.35 + 3.65 \times 3.65 \times 3.65}{63.5 \times 63.5 + 36.5 - 63.5 \times 36.5}$ is equal to:

$\frac{6.35 \times 6.35 \times 6.35 + 3.65 \times 3.65 \times 3.65}{63.5 \times 63.5 + 36.5 - 63.5 \times 36.5}$ का मान ज्ञात करें।

(A) 0.01 (B) 10
(C) 1 (D) 0.1

3. The value of $\frac{40 - \frac{3}{4} \text{ of } 32}{37 - \frac{3}{4} \text{of} (34 - 6)}$ is :

$\frac{40 - \frac{3}{4} \text{ of } 32}{37 - \frac{3}{4} \text{of} (34 - 6)}$ का मान ज्ञात करें।

(A) 1 (B) 0 (C) $-\frac{1}{2}$ (D) $\frac{1}{2}$

4. The value of $\left(5\frac{1}{4} \div \frac{3}{7} \text{of} \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21} - \left(5 \div 2 \text{of} \frac{1}{2}\right)$ is :

$\left(5\frac{1}{4} \div \frac{3}{7} \text{of} \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21} - \left(5 \div 2 \text{of} \frac{1}{2}\right)$ का मान ज्ञात करें।

(A) 0 (B) $\frac{35}{24}$
(C) -2 (D) $\frac{15}{28}$

5. The value of $\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025} - \frac{0.5}{1.5}$ is:

$\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025} - \frac{0.5}{1.5}$ का मान ज्ञात करें।

(A) 3 (B) 0
(C) -1 (D) -3

6. The value of $3\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)$ is :

$3\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)$ का मान ज्ञात करें।

(A) $\frac{55}{24}$ (B) $\frac{25}{24}$
(C) $\frac{35}{24}$ (D) $\frac{5}{24}$

7. The value of $2\frac{1}{3} \div 2\frac{1}{2} \text{of} 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)$ is :

$2\frac{1}{3} \div 2\frac{1}{2} \text{of} 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)$ का मान ज्ञात करें ?

(A) $\frac{29}{24}$ (B) $\frac{25}{24}$
(C) $\frac{5}{24}$ (D) $\frac{35}{24}$

8. The value of $\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025} + \frac{0.5}{1.5}$ is/का मान ज्ञात करें ?

(A) $\frac{11}{3}$ (B) 3

(C) 0 (D) $\frac{7}{3}$

9. The value of $\left(5 \div 2 \text{ of } \frac{1}{2}\right) + \left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21}$ is :

का मान ज्ञात करें ?

(A) $\frac{35}{24}$ (B) $\frac{15}{28}$

(C) –2 (D) 8

10. The value of $\frac{4.35 \times 4.35 \times 4.35 + 3.25 \times 3.25 \times 3.25}{43.5 \times 43.5 + 32.5 \times 32.5 - 43.5 \times 32.5}$ is :

$\frac{4.35 \times 4.35 \times 4.35 + 3.25 \times 3.25 \times 3.25}{43.5 \times 43.5 + 32.5 \times 32.5 - 43.5 \times 32.5}$ का मान ज्ञात करें।

(A) 0.0076 (B) 0.76

(C) 0.076 (D) 7.6

11. The value of $\frac{2}{3} \div \frac{3}{10} \text{ of } \frac{4}{9} - \frac{4}{5} \times 1\frac{1}{9} \div \frac{8}{15} - \frac{3}{4} + \frac{3}{4} \div \frac{1}{2}$ is :

$\frac{2}{3} \div \frac{3}{10} \text{ of } \frac{4}{9} - \frac{4}{5} \times 1\frac{1}{9} \div \frac{8}{15} - \frac{3}{4} + \frac{3}{4} \div \frac{1}{2}$ का मान ज्ञात करें।

(A) $\frac{25}{6}$ (B) $\frac{14}{3}$

(C) $\frac{17}{9}$ (D) $\frac{49}{12}$

12. The value of – 7 ÷ [5 + 1 ÷ 2 – {4 + (4 of 2 ÷ 4) + (4 ÷ 4 of 2)}] is :

– 7 ÷ [5 + 1 ÷ 2 – {4 + (4 of 2 ÷ 4) + (4 ÷ 4 of 2)}] का मान ज्ञान करें ?

(A) $-\frac{7}{2}$ (B) – 7

(C) $\frac{7}{2}$ (D) 7

13. The value of $\frac{40 + \frac{3}{4} \text{ of } 32}{37 + \frac{3}{4} \text{ of } (34 - 6)}$ is :

$\frac{40 + \frac{3}{4} \text{ of } 32}{37 + \frac{3}{4} \text{ of } (34 - 6)}$ का मान ज्ञात करें।

(A) $-1\frac{3}{29}$ (B) $1\frac{9}{29}$ (C) $2\frac{3}{29}$ (D) $1\frac{3}{29}$

14. The value of $\frac{5.35 \times 5.35 \times 5.35 + 3.65 \times 3.65 \times 3.65}{53.5 \times 53.5 + 36.5 \times 36.5 - 53.5 \times 36.5}$ is equal to:

$\frac{5.35 \times 5.35 \times 5.35 + 3.65 \times 3.65 \times 3.65}{53.5 \times 53.5 + 36.5 \times 36.5 - 53.5 \times 36.5}$ का मान ज्ञात करें।

(A) 0.9 (B) 90

(C) 0.09 (D) 9

15. The value of $1 - 3 \div 6 \text{ of } 2 + (4 \div 4 \text{ of } \frac{1}{4}) \div 8 + (4 \times 8 \div \frac{1}{4}) \times \frac{1}{8}$ is:

$1 - 3 \div 6 \text{ of } 2 + (4 \div 4 \text{ of } \frac{1}{4}) \div 8 + (4 \times 8 \div \frac{1}{4}) \times \frac{1}{8}$ का मान ज्ञात करें।

(A) $\frac{69}{4}$ (B) $-\frac{7}{4}$ (C) $-\frac{69}{4}$ (D) $\frac{7}{4}$

16. The value of $\frac{427 \times 427 \times 427 + 325 \times 325 \times 325}{42.7 \times 42.7 + 32.5 \times 32.5 - 42.7 \times 32.5}$ is:

$\frac{427 \times 427 \times 427 + 325 \times 325 \times 325}{42.7 \times 42.7 + 32.5 \times 32.5 - 42.7 \times 32.5}$ का मान ज्ञात करें।

(A) 75200 (B) 75.2

(C) 7520 (D) 752

17. The value of 7 ÷ [5 +1 ÷ 2 – {4 + (4 of 2 ÷ 4) + (5 ÷ 5 of 2)}] is.

7 ÷ [5 +1 ÷ 2 – {4 + (4 of 2 ÷ 4) + (5 ÷ 5 of 2)}] का मान ज्ञात करें।

(A) $\frac{7}{2}$ (B) –7

(C) $-\frac{7}{2}$ (D) 7

18. The value of $\frac{2}{3} \div \frac{3}{10}$ of $\frac{4}{9} - \frac{4}{5} \times 1\frac{1}{9} \div \frac{8}{15} + \frac{3}{4} \div \frac{1}{2}$ is.

$\frac{2}{3} \div \frac{3}{10} \text{ of } \frac{4}{9} - \frac{4}{5} \times 1\frac{1}{9} \div \frac{8}{15} + \frac{3}{4} \div \frac{1}{2}$ का मान ज्ञात करें।

(A) $\frac{17}{9}$ (B) $\frac{29}{6}$ (C) $\frac{14}{3}$ (D) $\frac{49}{12}$

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Solution

1. (D) $8-3\div 6 \text{ of } 2+(4\div 4 \text{ of } \frac{1}{4})\div 8+(4\times 8 \text{ of } \frac{1}{4})$

$8-3\div 6\times 2+(4\div 4 \text{ of } \frac{1}{4})\div 8+\left(\frac{32\times 4}{8}\right)$

$8-3\div 12\times 4\div 8+16$

$8-3\div 12+\frac{1}{2}+16$

$8-\frac{1}{4}+\frac{1}{2}+16$

$24+\frac{1}{4}$

$\frac{96+1}{4}=\frac{97}{4}$

2. (D) $\frac{1}{100}\frac{(6.35)^3+(3.65)^3}{(6.35)^2+(3.65)^2-6.35\times 3.65}$

$\frac{a^3+b^3}{a^2+b^2-ab}$

$\frac{(a+b)(a^2+b^2-ab)}{a^2+b^2-ab}$

$= a+b = 6.35+3.65$

$=\frac{10}{100}=0.1$

3. (A) $\frac{40-\frac{3}{4}\times 32}{37-\frac{3}{4}\times 28}=\frac{40-24}{37-21}=\frac{16}{16}=1$

4. (C) $\left(\frac{21}{4}\div\frac{3}{14}\right)\div\left(\frac{46}{9}-\frac{63}{8}\times\frac{20}{189}\right)\frac{11}{21}-5$

$\frac{49}{2}\div\left[\frac{46}{9}-\frac{5}{6}\right]\frac{11}{21}-5$

$=\frac{49}{2}\times\frac{18}{77}\times\frac{11}{21}-5$

$=3-5=-2$

5. (A) $\frac{0.325\times 0.325+0.175\times 0.175+25\times 0.00455}{5\times 0.0065+3.25-7\times 0.175\times 0.025}$

$-\frac{0.5}{1.5}$

$=\frac{[0.325+0.175]^2}{(0.325)^2-(0.175)^2}-\frac{1}{3}$

$=\frac{(0.325+0.175)}{(0.325-0.175)}-\frac{1}{3}$

$=\frac{50}{15}-\frac{1}{3}$

$=\frac{50-5}{15}=\frac{45}{15}=3$

6. (C) $3\frac{1}{3}\div 2\frac{1}{2} \text{ of } 1\frac{1}{3}+\left(\frac{3}{8}+\frac{1}{7}\times 1\frac{3}{4}\right)$

$\frac{10}{3}\div\frac{5}{2} \text{ of } \frac{8}{5}+\left(\frac{3}{8}+\frac{1}{4}\right)$

$\frac{10}{3}\times\frac{1}{4}+\frac{5}{8}$

$\frac{5}{6}+\frac{5}{8}=\frac{20+15}{24}$

$=\frac{35}{24}$

7. (A) $\frac{7}{3}\div\frac{5}{2}\times\frac{8}{5}+\left(\frac{3}{8}+\frac{1}{4}\right)$

$\Rightarrow\frac{7}{3}\times\frac{1}{4}+\frac{5}{8}$

$\Rightarrow\frac{7}{12}+\frac{5}{8}=\frac{29}{24}$

8. (A) $\frac{(0.325)^2+(0.175)^2+2(0.325\times 0.175)}{(0.325)^2-(.175)^2}$

$\Rightarrow\frac{a^2+b^2+2ab}{a^2-b^2}\Rightarrow\frac{(a+b)^2}{(a+b)(a-b)}$

$=\frac{a+b}{a-b}$

$\therefore\frac{.500}{.150}+\frac{.5}{1.5}$

$\Rightarrow\frac{50}{15}+\frac{5}{15}\qquad\Rightarrow\frac{55}{15}=\frac{11}{3}$

9. (D) $(5 \div 1) + \left(\frac{21}{4} \div \frac{3}{14}\right) \div \left(\frac{46}{9} - \frac{63}{8} \div \frac{189}{20}\right) \times \frac{11}{21}$

$\Rightarrow 5 + \frac{49}{2} \div \left(\frac{46}{9} - \frac{5}{6}\right) \times \frac{11}{21}$

$\Rightarrow 5 + \frac{49}{2} \div \left(\frac{77}{18}\right) \times \frac{11}{21}$

$\Rightarrow 5 + \frac{49}{2} \times \frac{18}{77} \times \frac{11}{21}$

$\Rightarrow 5 + \frac{63}{21} \Rightarrow 5 + 3 = 8$

10. (C) $\frac{a^3 + b^3}{a^2 + b^2 - ab}$

$= \frac{(a+b)(a^2 + b^2 - ab)}{(a^2 + b^2 - ab)}$

$= \frac{4.35 \times 4.35 \times 4.35 + 3.25 \times 3.25 \times 3.25}{10(4.35 \times 4.35 + 3.25 \times 3.25 - 4.35 \times 3.25)}$

$= \frac{(4.35 + 3.25)}{10}$

$= 7.6$

11. (D) $\frac{2}{3} \div \frac{3}{10} \times \frac{4}{9} - \frac{4}{5} \times \frac{10}{9} \div \frac{8}{15} - \frac{3}{4} + \frac{3}{4} \div \frac{1}{2}$

$\frac{2}{3} \div \frac{4}{30} - \frac{4}{5} \times \frac{10}{9} \div \frac{8}{15} - \frac{3}{4} + \frac{3}{4} \div \frac{1}{2}$

$\frac{2}{3} \times \frac{30}{4} - \frac{4}{5} \times \frac{10}{9} \times \frac{15}{8} - \frac{3}{4} + \frac{3}{4} \times \frac{2}{1}$

$5 - \frac{8}{9} \times \frac{15}{8} - \frac{3}{4} + \frac{3}{2}$

$5 - \frac{5}{3} - \frac{3}{4} + \frac{3}{2}$

$\frac{60 - 20 - 9 - 18}{12} = \frac{49}{12}$

12. (D) $-7 \div \left[[5 + 1 \div 2 - \left\{4 + (2) + \frac{1}{2}\right\}\right]$

$= -7 \div \left[5 + \frac{1}{2} - \frac{13}{2}\right]$

$= -7 \div [5 - 6]$

$= -7 \div (-1)$

$= 7$

13.(D) $\frac{40 + 3 \times 8}{37 + 3 \times 7} = \frac{64}{58} = 1\frac{3}{29}$

14.(C) $\frac{5.35 \times 5.35 \times 5.35 + 3.65 \times 3.65 \times 3.65}{100[5.35 \times 5.35 + 3.65 \times 3.65 - 5.35 \times 3.65]}$

$= \frac{a^3 + b^3}{(a^2 + b^2 - ab)100} \Rightarrow \frac{a+b}{100}$

$\Rightarrow \frac{(5.35 + 3.65)}{100} = 0.09$

15.(A) $1 - 3 \div 12 + (4 \div (1)) \div 8 + (4 \times 8 \times 4) \times \frac{1}{8}$

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

$\Rightarrow \frac{4 - 1 + 2 + 64}{4} = \frac{69}{4}$

16. (A) $\frac{a^3 + b^3}{\frac{a^2}{100} + \frac{b^2}{100} - \frac{ab}{100}} = (a + b)$

$\Rightarrow (427 + 325)100$

$= 75200$

17. (B) $7 \div \left[5 + 1 - 2 - \left\{4 + \left(8 \times \frac{1}{4}\right) + \left(5 \times \frac{1}{10}\right)\right\}\right]$

$= 7 \div \left[5 + \frac{1}{2} - \left\{(4 + 2) + \frac{1}{2}\right\}\right]$

$= 7 \div \left[\frac{11}{2} - 6 - \frac{1}{2}\right]$

$= 7 \div \left[\frac{11 - 12 - 1}{2}\right]$

$= \frac{7}{-1} = -7$

18. (B) $\frac{2}{3} \times \frac{90}{12} - \frac{4}{5} \times \frac{10}{9} \times \frac{15}{8} + \frac{3}{4} \times 2$

$= 5 - \frac{15}{9} + \frac{3}{2} \Rightarrow 5 - \frac{5}{3} + \frac{3}{2}$

$= \frac{30 - 10 + 9}{6} = \frac{29}{6}$

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Simplification (CPO — 2019)

1. What is the simplified value of/सरल मान ज्ञात करो :

$$7\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} - \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right) - \frac{5}{24}$$

(A) 2 (B) $\frac{1}{24}$ (C) 1 (D) $\frac{1}{12}$

2. What is the simplified value of/ सरल मान ज्ञात करो:

$$\left(1 - \frac{1}{4 - \frac{2}{1 + \frac{1}{\frac{1}{3} + 2}}}\right) \times \frac{15}{16} \div \frac{2}{3} \text{ of } 2\frac{1}{4} - \frac{3+4}{3^3 + 4^3}$$

(A) $\frac{6}{13}$ (B) $\frac{8}{13}$ (C) $\frac{5}{13}$ (D) $\frac{4}{13}$

3. (320 + 342 + 530 + 915)÷(20 + 22 – x + 18) = 43, then the value of x is :
यदि (320 + 342 + 530 + 915) ÷ (20 + 22 – x + 18) = 43 है, तो x का मान क्या होगा ?
(A) 11 (B) 23
(C) 26 (D) 15

4. The value of $\frac{1}{\sqrt{7-4\sqrt{3}}}$ is closest to :

$\frac{1}{\sqrt{7-4\sqrt{3}}}$ का मान इनमें से किसके निकटतम है ?
(A) 4.1 (B) 4.2
(C) 1.2 (D) 3.7

5. The value of lies between :

$$\frac{0.325 \times 0.325 + 0.175 \times 0.175 - 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.0175 \times 0.025}$$

$\frac{0.325 \times 0.325 + 0.175 \times 0.175 - 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.0175 \times 0.025}$ का मान किसके मध्य है ?
(A) 0.25 and 0.35 (B) 0.05 and 0.15
(C) 0.15 and 0.25 (D) 0.35 and 0.45

6. The value of 5 ÷ [5 + 8 – {4 + (4 of 2 ÷ 4) – (2 ÷ 4 of 2)}] is :
5 ÷ [5 + 8 – {4 + (4 of 2 ÷ 4) – (2 ÷ 4 of 2)}] का मान ज्ञात कीजिए।
(A) $\frac{5}{8}$ (B) $\frac{5}{7}$
(C) $\frac{20}{29}$ (D) $\frac{20}{23}$

7. The value of $\left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21} + \left(2 \div 2 \text{ of } \frac{1}{2}\right)$ is :
$\left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21} + \left(2 \div 2 \text{ of } \frac{1}{2}\right)$ का मान ज्ञात कीजिए।
(A) $\frac{9}{4}$ (B) 5 (C) 3 (D) $\frac{7}{2}$

8. What is the value of $\frac{0.74 \times 1.23 \times 0.13}{(0.37)^3 + (0.41)^3 - 8(0.39)^3}$?

$\frac{0.74 \times 1.23 \times 0.13}{(0.37)^3 + (0.41)^3 - 8(0.39)^3}$ का मान ज्ञात कीजिये ?
(A) $\frac{-1}{3}$ (B) 1 (C) –1 (D) $\frac{1}{3}$

9. A student was asked to find the value of

$$\left[\frac{4}{9} \div \left(\frac{3}{5} \div \frac{3}{2}\right) \times \frac{9}{25}\right] \times \frac{\left[\frac{2}{3} \text{ of } \frac{4}{9} \div \left(3 \times \frac{3}{5} \text{ of } \frac{4}{5}\right)\right]}{\frac{2}{3} \div \frac{3}{4} \text{ of } \frac{5}{6}}$$ his answer was $\frac{2}{9}$. What is the difference between his answer and the difference between his answer and the correct answer?

एक विद्यार्थी को $\left[\frac{4}{9} \div \left(\frac{3}{5} \div \frac{3}{2}\right) \times \frac{9}{25}\right] \times \frac{\left[\frac{2}{3} \text{ of } \frac{4}{9} \div \left(3 \times \frac{3}{5} \text{ of } \frac{4}{5}\right)\right]}{\frac{2}{3} \div \frac{3}{4} \text{ of } \frac{5}{6}}$ का मान निकालने के लिए कहा गया

था। उसका उत्तर $\frac{2}{9}$ था। उसके उत्तर और सही उत्तर के बीच का अंतर ज्ञात कीजिये ?

(A) $\frac{1}{12}$ (B) $\frac{1}{4}$ (C) $\frac{1}{6}$ (D) $\frac{47}{324}$

10. The value of $\frac{5-\left[2+3\left(2-2\times2+5\right)\right]\div5}{4\times4\div4\,\text{of}\left(4+4\div4\,\text{of}\,4\right)}$ is

$\frac{5-\left[2+3\left(2-2\times2+5\right)\right]\div5}{4\times4\div4\,\text{of}\left(4+4\div4\,\text{of}\,4\right)}$ का मान ज्ञात कीजिये ?

(A) $4\frac{3}{80}$ (B) $7\frac{3}{5}$

(C) $3\frac{3}{16}$ (D) $\frac{2}{5}$

11. The value of $9\times[(9-4)\div\{(8\div8\text{ of }4)+(4\div4\text{ of }2)\}]$ is

$9\times[(9-4)\div\{(8\div8\text{ of }4)+(4\div4\text{ of }2)\}]$ का मान ज्ञात कीजिये।

(A) 20 (B) 60 (C) $\frac{15}{4}$ (D) $\frac{15}{2}$

12. The value of

$\frac{4.669\times4.669-9\times(0.777)^2}{(4.669)^2+(2.331)^2+14(0.667)(2.331)}$ is (1 – k), where k = ?

$\frac{4.669\times4.669-9\times(0.777)^2}{(4.669)^2+(2.331)^2+14(0.667)(2.331)}$ का मान (1 – k) है, जिसमें k = ?

(A) 0.666 (B) 0.647

(C) 0.467 (D) 0.768

13. The value of $\frac{\frac{1}{3}-\left[4\frac{3}{4}-\left(3\frac{1}{6}-2\frac{1}{3}\right)\right]}{\left(\frac{1}{5}\text{ of }\frac{1}{5}\div\frac{1}{5}\right)\div\left(\frac{1}{5}\div\frac{1}{5}\times\frac{1}{5}\right)}$ lies between :

$\frac{\frac{1}{3}-\left[4\frac{3}{4}-\left(3\frac{1}{6}-2\frac{1}{3}\right)\right]}{\left(\frac{1}{5}\text{ of }\frac{1}{5}\div\frac{1}{5}\right)\div\left(\frac{1}{5}\div\frac{1}{5}\times\frac{1}{5}\right)}$ का मान किसके मध्य में होगा ?

(A) 10.2 and 10.8 (B) 4.2 and 4.4

(C) 8.2 and 8.8 (D) 0.4 and 0.9

14. The value of $\sqrt{11+2\sqrt{18}}$ is closest to :

$\sqrt{11+2\sqrt{18}}$ का मान किसके निकटतम है ?

(A) 4.8 (B) 4.4

(C) 3.8 (D) 4.1

15. The value of/का मान ज्ञात कीजिए।

$\frac{\left(3\frac{1}{3}-2\frac{1}{2}\right)\div\frac{1}{4}\,of\,1\frac{1}{4}}{\frac{3}{10}+\frac{1}{6}\times\frac{1}{3}}$ of $\frac{4}{15}\div\frac{\frac{1}{3}\div\frac{1}{3}\,of\,\frac{1}{9}}{\frac{1}{9}\times\frac{1}{3}\div\frac{1}{6}}$?

(A) $\frac{9}{2}$ (B) $\frac{2}{9}$ (C) $\frac{4}{41}$

(D) $\frac{27}{8}$

16. The value of $\frac{(0.13)^2+(0.21)^2}{(0.39)^2+81(0.07)^2}\div\frac{(2.4)^4+3\times(11.52)+9}{(2.4)^6+6(2.4)^4+3\times(17.28)}$ lies between:

$\frac{(0.13)^2+(0.21)^2}{(0.39)^2+81(0.07)^2}\div\frac{(2.4)^4+3\times(11.52)+9}{(2.4)^6+6(2.4)^4+3\times(17.28)}$ का मान किसके बीच स्थित है ?

(A) 0.4 and 0.5

(B) 0.7 and 0.8

(C) 0.5 and 0.6 (D) 0.6 and 0.7

17. The value of $\sqrt{6-\sqrt{17-2\sqrt{72}}}$ is closest to:

$\sqrt{6-\sqrt{17-2\sqrt{72}}}$ का मान किसके निकतम है ?

(A) 2.4

(B) 2.7

(C) 2.1 (D) 1.7

18. The value of $8\div[(9-5)\div\{(4\div2\text{ of }4)-(8\div8\text{ of }16)+(4\times2\div8)\}]$ is: $8\div[(9-5)\div\{(4\div2\text{ of }4)-(8\div8\text{ of }16)+(4\times2\div8)\}]$ का मान ज्ञात कीजिए।

(A) $\frac{21}{2}$ (B) $\frac{12}{23}$ (C) $\frac{32}{23}$ (D) $\frac{23}{8}$

19. The value of

$\frac{17.35+\frac{7}{5}\text{of }55-7}{(42\div6\times8.35)-\frac{3}{7}\text{of}\left(\frac{2}{3}-\frac{1}{5}\right)+[291\div(80\div8)]}$:

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$\frac{17.35+\frac{7}{5}\text{of}\,55-7}{(42\div 6\times 8.35)-\frac{3}{7}\text{of}\left(\frac{2}{3}-\frac{1}{5}\right)+[291\div(80\div 8)]}$ का मान है –

(A) 1 (B) 3
(C) 2 (D) 4

20. Find out the value of $\frac{56+\frac{2}{3}\text{of}\,27-8}{15-\frac{3}{5}\text{of}\,(29-14)}$:

$\frac{56+\frac{2}{3}\text{of}\,27-8}{15-\frac{3}{5}\text{of}\,(29-14)}$ का मान ज्ञात कीजिए।

(A) 12 (B) 11 (C) 10 (D) 15

21. If $\sqrt{0.00576\times y}=2.4$, then what is the value of y?

यदि $\sqrt{0.00576\times y}=2.4$ है, तो y का मान क्या है ?

(A) 2400 (B) 3600
(C) 1200 (D) 1000

22. What is the value of $\frac{(2.8)^3+(2.2)^3}{(28)^2-28\times 22+484}$?

$\frac{(2.8)^3+(2.2)^3}{(28)^2-28\times 22+484}$ का मान क्या है ?

(A) 0.5 (B) 0.01
(C) 0.05 (D) 0.02

23. The value of $\frac{(0.321)^3+(0.456)^3-(0.777)^3}{0.9\times(0.107)(0.76)(0.777)}$

का मान ज्ञात कीजिए ?

(A) 60 (B) – 6
(C) – 3 (D) 30

24. The value of

$\frac{5-2\div 4\times\left[5-(3-4)\right]+5\times 4\div 2\ of\ 4}{4+4\div 8\ of\ 2\times(8-5)\times 2\div 3-8\div 2 of\ 8}$ is

का मान बताइए ?

(A) $\frac{9}{8}$ (B) $\frac{9}{4}$ (C) $\frac{15}{32}$ (D) $\frac{89}{4}$

25. A student was asked to find the value of $\frac{\left(2\frac{1}{3}+2\frac{1}{2}-\frac{1}{6}\right)\div 2\frac{1}{3}\times 5\frac{2}{3}\div 1\frac{2}{3}of\ 4\frac{1}{4}}{3\frac{1}{5}\div 4\frac{1}{2}\ of\ 5\frac{1}{3}+5\frac{1}{3}\times\frac{3}{4}\div 2\frac{2}{3}}$. His answer was 6/7. What is the difference between the correct answer and his answer?

एक विद्यार्थी को $\frac{\left(2\frac{1}{3}+2\frac{1}{2}-\frac{1}{6}\right)\div 2\frac{1}{3}\times 5\frac{2}{3}\div 1\frac{2}{3}of\ 4\frac{1}{4}}{3\frac{1}{5}\div 4\frac{1}{2}\ of\ 5\frac{1}{3}+5\frac{1}{3}\times\frac{3}{4}\div 2\frac{2}{3}}$ का मान निकालने के लिए कहा गया था। उसका उत्तर 6/7 था। सही उत्तर और उसके उत्तर के बीच अंतर ज्ञात कीजिए।

(A) $\frac{9}{14}$ (B) $\frac{5}{14}$ (C) $\frac{11}{49}$ (D) $\frac{6}{49}$

26. The value of $\sqrt{9-2\sqrt{11-6\sqrt{2}}}$ is closest to:

$\sqrt{9-2\sqrt{11-6\sqrt{2}}}$ का मान किसके निकटतम है ?

(A) 2.7 (B) 2.9
(C) 2.4 (D) 2.1

27. The value of

$\frac{4-3\div 2\times(4-2)-3+4\times 3\div 2+4}{4+3\div 4\times(2-4)\times 4+3\div 4\text{of}\,3}$ is .....

$\frac{4-3\div 2\times(4-2)-3+4\times 3\div 2+4}{4+3\div 4\times(2-4)\times 4+3\div 4\text{of}3}$ का मान ज्ञात कीजिए।

(A) – 32 (B) 32 (C) $\frac{-32}{7}$ (D) $\frac{32}{7}$

28. The value of $\frac{1}{\sqrt{17+12\sqrt{2}}}$ is closest to ..... .

$\frac{1}{\sqrt{17+12\sqrt{2}}}$ का मान किसके निकटतम है ?

(A) 1.4 (B) 1.2
(C) 0.14 (D) 0.17

29. The value of $\frac{(0.013)^3+(0.007)(0.000049)}{(0.007)^2+0.013(0.013-0.007)}$ is .....

$\frac{(0.013)^3+(0.007)(0.000049)}{(0.007)^2+0.013(0.013-0.007)}$ का मान ज्ञात कीजिए।

(A) 0.06 (B) 0.02
(C) 0.07 (D) 0.04

Solution

1. (C) $7\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} - \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right) - \frac{5}{24}$

Using BODMAS Rule

$\frac{22}{3} \div \frac{5}{2} \times \frac{8}{5} - \left(\frac{3}{8} + \frac{1}{7} \times \frac{7}{4}\right) - \frac{5}{24}$

$\frac{22}{3} \div 4 - \left(\frac{3}{8} + \frac{1}{4}\right) - \frac{5}{24}$

$\frac{22}{12} - \left(\frac{5}{8}\right) - \frac{5}{24}$

$\frac{22}{12} - \frac{20}{24}$

$\Rightarrow \frac{24}{24} = 1$

2. (D) $\left(1 - \frac{1}{4 - \frac{2}{1 + \frac{1}{\frac{1}{3} + 2}}}\right) \times \frac{15}{16} \div \frac{2}{3} \text{ of } \frac{9}{4} - \frac{7}{27 + 64}$

..... I .....

Solving Ist column

$\left(1 - \frac{1}{4 - \frac{2}{1 + \frac{3}{7}}}\right) = \left(1 - \frac{1}{4 - \frac{7}{5}}\right)$

$= \left(1 - \frac{5}{13}\right) = \left(\frac{8}{13}\right)$

Using this value in original equation

$\frac{8}{13} \times \frac{15}{16} \div \frac{2}{3} \times \frac{9}{4} - \frac{7}{91}$

$\frac{8}{13} \times \frac{15}{16} \div \frac{3}{2} - \frac{1}{13}$

$\frac{8}{13} \times \frac{15}{16} \times \frac{2}{3} - \frac{1}{13}$

$\frac{5}{13} - \frac{1}{13} = \frac{4}{13}$

3. (A) $\left(\frac{2107}{60 - x}\right) = 43$

$49 = 60 - x$

$\Rightarrow x = 11$

4. (D) $\frac{1}{\sqrt{7 - 4\sqrt{3}}}$

$\Rightarrow \frac{1}{\sqrt{(2 - \sqrt{3})^2}} = \frac{1}{2 - \sqrt{3}} \times \frac{2 + \sqrt{3}}{2 + \sqrt{3}}$

$\Rightarrow 2 + \sqrt{3} \ (\because \sqrt{3} = 1.73)$

$\Rightarrow 2 + 1.73 = 3.73$

5. (A) $\frac{(0.325)^2 + (0.175)^2 - 2 \times 0.175 \times 0.325}{(0.325)^2 - (0.175)^2}$

$\Rightarrow \frac{(0.325 - 0.175)^2}{(0.325)^2 - (0.175)^2} = \frac{(0.325 - 0.175)}{(0.325 + 0.175)}$

$\Rightarrow \frac{0.15}{0.5} = 0.3$

6. (C) $5 \div [4 + (4 \text{ og } 2 \div 4) - (2 \div 40f2)]$

Using BODMAS Rule

$5 \div [13 - \{4 + (2) - \left(\frac{1}{4}\right)\}]$

$5 \div [13 - \{6 - \frac{1}{4}\}]$

$5 \div [14 - 6 + \frac{1}{4}]$

$5 \div [7 + \frac{1}{4}]$

$5 \div [\frac{29}{4}] \Rightarrow \frac{5 \times 4}{29} = \frac{20}{29}$

7. (B) $\left(\frac{21}{4} \div \frac{3}{7} of \frac{1}{2}\right) \div \left(\frac{46}{9} - \frac{63}{8} \div \frac{189}{20}\right) \times \frac{11}{21} +$

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$(2 \div \text{of } \frac{1}{2})$

Using BODMAS Rule

$$\left(\frac{21}{4}\times\frac{14}{3}\right)\div\left(\frac{46}{9}-\frac{63}{8}\times\frac{20}{189}\right)\times\frac{11}{21}+2$$

$$\frac{49}{2}\div\left(\frac{46}{9}-\frac{5}{6}\right)\times\frac{11}{21},+2\frac{49}{2}\div\left(\frac{77}{18}\right)\times\frac{11}{21}+2$$

$$\frac{49}{2}\times\frac{18}{77}\times\frac{11}{21}+2$$

$$\frac{7\times3}{7}+2$$

$\Rightarrow 3 + 2 = 5$

8. (A) Solving denominator

$(0.37)^3 + (0.41)^3 - 2^3 (0.39)^3$

$= (0.37)^3 + (0.41)^3 - (0.78)^3$

As we know,

$$a^3 + b^3 + c^3 - 3abc = \frac{(a+b+c)}{2}$$

$$[(a-b)^2 + (b-c)^2 + (c-a)^2]$$

If $a + b + c = 0$

$a^3 + b^3 + c^3 = 3abc$

$\Rightarrow (0.37)^3 + (0.41)^3 = (0.78)^3$

$= -3 \times (0.37) \times (0.41)\ (0.78)$

$$\Rightarrow -\frac{0.74\times1.23\times0.13}{3\times0.37\times0.41\times0.78} = \frac{-1}{3}$$

9. (D) First solving

$$\frac{2}{3}\text{of}\frac{4}{9}\div\left(3\times\frac{3}{5}\text{of}\frac{4}{5}\right)$$

$$= \frac{2}{3}\times\frac{4}{9}\div\left(3\times\frac{3}{5}\times\frac{4}{5}\right)$$

$$= \frac{8}{27}\div\left(\frac{36}{25}\right) = \frac{8}{27}\times\frac{25}{36} = \frac{50}{243}$$

Second

$$\frac{4}{9}\div\left(\frac{3}{5}\div\frac{3}{2}\right)\times\frac{9}{25}$$

$$= \frac{4}{9}\div\left(\frac{2}{5}\right)\times\frac{9}{25}$$

$$= \frac{4}{9}\times\frac{5}{2}\times\frac{9}{25} = \frac{2}{5}$$

Third

$$\frac{2}{3}\div\frac{3}{4}\text{of}\frac{5}{6} = \frac{2}{3}\div\frac{3}{4}\times\frac{5}{6}$$

$$= \frac{2}{3}\div\frac{5}{8}$$

$$= \frac{2}{3}\times\frac{8}{5} = \frac{16}{15}$$

Putting respective values at original place

$$= \frac{2}{5}\times\frac{\left(\frac{50}{243}\right)}{\left(\frac{16}{15}\right)}$$

$$= \frac{2}{5}\times\frac{50}{243}\times\frac{15}{16} = \frac{25}{324}$$

10. (A) $$\frac{5-\left[2+3(2-2\times2+5)-5\right]\div5}{4\times4\div4\text{ of }(4+4\div4\text{ of }4)}$$

Solving numerator

$5 - [2 + 3(3) - 5] \div 5$

$= 5 - [6] \div 5$

$= 5 - \frac{6}{5} \Rightarrow \frac{19}{5}$

Solving Denominator

$4 \times 4 \div 4$ of $(4 + 4 \div 16)$

$$4\times4\div4\text{ of }\left(\frac{17}{4}\right)$$

$$4\times4\div17 = \frac{16}{17}$$

$$\Rightarrow \frac{\left(\frac{19}{5}\right)}{\left(\frac{16}{17}\right)} = \frac{19\times17}{80}$$

$$= \frac{323}{80} = 4\frac{3}{80}$$

11. (B) $9[(9 - 4) \div \{8 \div 8 \text{ of } 4) + (4 \div 4 \text{ of } 2)]$

$$9\left[5\div\left[\left(\frac{1}{4}\right)+\frac{1}{(2)}\right]\right]$$

$$9\times\frac{20}{3} = 60$$

12. (A) $$\frac{4.669\times4.669-9(0.777)^2}{(4.669)^2+(2.331)^2+14(0.667)(2.331)}$$

$$\frac{(4.669)^2-(2.331)^2}{(4.669)^2+(2.331)^2+2.(4.669)(2.331)}$$

$$\left[\frac{a^2-b^2}{(a+b)^2}=\frac{a-b}{a+b}\right]$$

$$= \frac{4.669-2.331}{4.669+2.331}$$

$$= \frac{2.338}{7} = 0.334$$

Given that

$0.334 = 1 - k$

$K = 0.666$

13. (B) $$\frac{\frac{1}{3}-\left[\frac{19}{4}-\left(\frac{19}{6}-\frac{7}{6}\right)\right]}{\left(\frac{1}{5}\times\frac{1}{5}\div\frac{1}{5}\right)\div\left(\frac{1}{5}\div\frac{1}{5}\times\frac{1}{5}\right)}$$

$$= \frac{51}{12} = 4.25$$

It will lies between 4.2 and 4.4

14. (B) $x = \sqrt{11+2\sqrt{18}}$

$$x = \sqrt{3^2+\left(\sqrt{2}\right)^2+2\times3.\sqrt{2}}$$

$x = \left(3+\sqrt{2}\right)$

$x = 3 + 1.414$

$x = 4.414$

15. (C)

16. (D)

17. (A)

18. (D)

19. (A)

20. (B)

21. (D)

22. (C)

23. (B)

24. (A)

25. (D)

26. (C)

27. (C) $$\frac{4-3\div2\times(4-2)-3+4\times3\div2+4}{4+3\div4\times(2-4)\times4+3\div4 \text{ of } 3}$$

By rule of BODMAS

$$\Rightarrow \frac{4-3\div2\times2-3+4\times3\div2+4}{4+3\div4\times(2-4)\times4+3\div4 \text{ of } 3}$$

$$\Rightarrow \frac{4-3\div2\times2-3+4\times3\div2+4}{4+3\div4(-2)\times4+3\div12}$$

$$\Rightarrow \frac{4-\frac{3}{2}\times2-3+4\times\frac{3}{2}+4}{4+\frac{3}{4}\times(-2)\times4+\frac{3}{12}}$$

$$\Rightarrow \frac{4-3-3+6+4}{4-6+\frac{1}{4}} = \frac{8}{\frac{16-24+1}{4}}$$

$$\Rightarrow -\frac{8\times4}{7} = -\frac{32}{7}$$

28. (D) $$\frac{1}{\sqrt{\left(\sqrt{8}\right)^2+\left(\sqrt{9}\right)^2+2\times\sqrt{8}\sqrt{9}}} \Rightarrow \frac{1}{\sqrt{\left(\sqrt{8}+\sqrt{9}\right)^2}}$$

$$\Rightarrow \frac{1}{\sqrt{9}+\sqrt{8}}$$

$\Rightarrow$ Now we take rationalization

$$\Rightarrow \frac{1\left(\sqrt{9}-\sqrt{8}\right)}{\left(\sqrt{9}+\sqrt{8}\right)\left(\sqrt{9}-\sqrt{8}\right)}$$

$$\Rightarrow \frac{\sqrt{9}-\sqrt{8}}{1} = 3 - 2.82 = \boxed{.18} \sim \boxed{.17}$$

29. (B) $$\frac{(0.013)^3+(0.007)^3}{(0.007)^2+(0.013)^2-0.013\times0.007}$$

Now let, 0.013 = x, 0.007 = y

$$\Rightarrow \frac{x^3+y^3}{x^2+y^2-xy} \Rightarrow \frac{(x+y)\left(x^2+y^2-xy\right)}{x^2+y^2-xy}$$

$= 0.013 + 0.007 = 0.02$

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Simplification (CPO — 2018)

1. $\frac{675\times675\times675+325\times325\times325}{67.5\times67.5+32.5\times32.5-67.5\times32.5}$ is euqual to:

निम्नलिखित में से किसके बराबर है:

(A) 100 (B) 10,000

(C) 1,000 (D) 1,00,000

2. Two numbers are in the ratio 4 : 5. If their HCF is 16, then the sum of these two numbers is:

दो संख्याएँ 4 : 5 के अनुपात में हैं। यदि उनका महत्तम समापवर्तक (HCF) 16 है, तो इन दोनों संख्याओं का योग होगा:

(A) 144 (B) 124

(C) 160 (D) 150

3. $4\frac{4}{5}\div\frac{3}{7}$ of $7+\frac{4}{5}\times\frac{3}{10}-\frac{1}{5}$ is equal to:

निम्नलिखित में से किसके बराबर है:

(A) $\frac{7}{5}$ (B) $\frac{8}{5}$

(C) $\frac{34}{25}$ (D) $\frac{41}{25}$

4. Two numbers are in the ratio 4:7. If their HCF is 26. then the sum of these two numbers will be:

दो संख्याएँ 4 : 7 के अनुपात में है। यदि उनका HCF, 26 है, तो इन संख्याओं का योग होगा ?

(A) 312 (B) 364

(C) 338 (D) 286

5. The square root of which of the following is a rational number?

निम्नलिखित में से किसका वर्गमूल एक परिमेय संख्या् है ?

(A) 5823.82 (B) 22504.9

(C) 2460.14 (D) 1489.96

6. $\frac{5.75\times5.75\times5.75+3.25\times3.25\times3.25}{57.5\times57.5+32.5\times32.5-57.5\times32.5}$ is equal to:

$\frac{5.75\times5.75\times5.75+3.25\times3.25\times3.25}{57.5\times57.5+32.5\times32.5-57.5\times32.5}$ बराबर है—

(A) 0.009 (B) 0.0009

(C) 0.9 (D) 0.09

7. $5\frac{5}{6}+\left[2\frac{2}{3}-\left\{3\frac{3}{4}\left(3\frac{4}{5}\div9\frac{1}{2}\right)\right\}\right]$ is equal to:

$5\frac{5}{6}+\left[2\frac{2}{3}-\left\{3\frac{3}{4}\left(3\frac{4}{5}\div9\frac{1}{2}\right)\right\}\right]$ बराबर है-

(A) $\frac{44}{7}$ (B) 7 (C) $\frac{43}{6}$ (D) $\frac{22}{3}$

8. The value of

$3\frac{1}{5}-\left[2\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{2}{5}+\frac{3}{10}-\frac{4}{15}\right)\right\}\right]$ is :

$3\frac{1}{5}-\left[2\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{2}{5}+\frac{3}{10}-\frac{4}{15}\right)\right\}\right]$ का मान है-

(A) $\frac{6}{5}$ (B) $\frac{9}{10}$ (C) $\frac{11}{10}$ (D) $\frac{13}{5}$

9. Two numbers are in the ratio 5:11. If their HCF is 24, then the sum of two these numbers is:

दो संख्याऐं 5 : 11 के अनुपात में है। यदि उसका महत्त्म समापवर्तक (HCF) 24 है। तो इन दोनों संख्याओं का योग होगा।

(A) 384 (B) 408

(C) 120 (D) 264

10. $\frac{6.75\times6.75\times6.75-4.25\times4.25\times4.25}{67.5\times67.5+42.5\times42.5+67.5\times42.5}$ is equal to/ बराबर है —

(A) 2.5 (B) 0.25

(C) 0.0025 (D) 0.025

11. $5\frac{1}{5}-\left[3\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{3}{5}+\frac{1}{10}-\frac{4}{15}\right)\right\}\right]$ is equal to/ के बराबर है :

(A) $\frac{21}{10}$ (B) $\frac{7}{5}$

(C) $\frac{7}{3}$ (D) $\frac{8}{3}$

12. The value of $3\frac{5}{6}+\left[3\frac{2}{3}-\left\{\frac{15}{4}\left(5\frac{4}{5}\div 14\frac{1}{2}\right)\right\}\right]$ is equal to:

$3\frac{5}{6}+\left[3\frac{2}{3}-\left\{\frac{15}{4}\left(5\frac{4}{5}\div 14\frac{1}{2}\right)\right\}\right]$ का मान निम्नलिखित में से किसके बराबर है ?

(A) $\frac{37}{6}$ (B) $\frac{35}{6}$ (C) 6 (D) $\frac{19}{3}$

13. Two numbers are in the ratio 6 : 11. If their HCF is 28, then the sum of these two numbers is:

दो संख्याएं 6 : 11 के अनुपात में है। यदि उनका महत्तम समापवर्तक 28 है, तो इन दोनों संख्याओं का योग होगा:

(A) 476 (B) 448
(C) 392 (D) 420

14. $\frac{63.5\times63.5\times63.5+36.5\times36.5\times36.5}{6.35\times6.35+3.65\times3.65-6.35\times3.65}$ is equal to/ बराबर है:

(A) 10,000 (B) 1,00,000
(C) 100 (D) 1,000

15. The square root which of the following is a rational number?

निम्नलिखित में से किसका वर्गमूल एक परिमेय संख्या है ?

(A) 5535.36 (B) 3152.88
(C) 72905.2 (D) 67508.5

16. The value of

$6\frac{1}{5}-\left[4\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{3}{5}+\frac{3}{10}-\frac{7}{15}\right)\right\}\right]$ is/का मान है—

(A) 2.5 (B) 1.8 (C) 2.1 (D) 2.8

17. $\frac{17}{30}+\left[3\frac{1}{5}-\left\{\frac{5}{6}-\left(3\frac{4}{5}\div 9\frac{1}{2}\right)\right\}\right]$ is equal to/बराबर है—

(A) $\frac{3}{5}$ (B) $\frac{1}{5}$ (C) $\frac{11}{3}$ (D) $\frac{10}{3}$

18. The value of $3\times3-[6-\{12+15\div(7-2)\}]$ is equal to:

$3\times3-[6-\{12+15\div(7-2)\}]$ का मान है:

(A) –15 (B) 18
(C) 0 (D) 15

19. The value of $\frac{1}{3}\div\frac{5}{6}\times\frac{-5}{8}$ is equal to :

$\frac{1}{3}\div\frac{5}{6}\times\frac{-5}{8}$ का मान ज्ञात कीजिये ?

(A) 1 (B) $\frac{1}{4}$ (C) $\frac{-1}{4}$ (D) 0

20. To what power - 3 should be raised to get - 2187?

किस नम्बर पर – 3 की घात लगाई जाए कि – 2187 प्राप्त हो जाए ?

(A) 5 (B) 7
(C) –7 (D) –5

21. The HCF and LCM of two numbers is 6 and 5040 respectively. If one of the numbers is 210, then the other number is:

दो संख्याओं का म.स.प. और ल.स.प. क्रमशः 6 और 5040 है। यदि एक संख्या 210 है, तो दूसरी संख्या ज्ञात कीजिये ?

(A) 256 (B) 144
(C) 30 (D) 630

22. Which of the following statement is true?

निम्नलिखित में से कौनसा कथन सत्य है।

(A) LCM of two natural numbers is divisible by their HCF. /
दो प्राकृतिक संख्याओं का LCM उनके HCF से भाज्य है।

(B) HCF+LCM of two number = Product of the two numbers /
HCF+LCM दोनों संख्याओं का योग = दोनों संख्याओं का गुणनफल

(C) Two prime numbers are co-prime numbers if their LCM is 1. /
दो भाज्य संख्याएं सहभाज्य संख्याएं है यदि उनका LCM 1 है।

(D) HCF of two numbers is the smallest common divisor of both numbers. /
दो संख्याओं का HCF दोनों संख्याओं का सबसे छोटा सामान्य भाजक है।

23. 7 - {4 × 3 - (-10) × 8 ÷ (-4)} is equal to:

7 - {4 × 3 - (-10) × 8 ÷ (-4)} मान क्या है ?

(A) – 1 (B) 53
(C) 0 (D) 15

24. $\frac{3}{5}\times4\left[7-\left\{\frac{2}{5}\times(13+2)\right\}\right]$ is equal to :

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$\frac{3}{5}\times 4\left[7-\left\{\frac{2}{5}\times(13+2)\right\}\right]$ का मान है ?

(A) 1 (B) $\frac{1}{5}$ (C) $2\frac{2}{5}$ (D) 0

25. A and B start walking together from a point. Their steps measure 72 cm and 84 cm respectively. What is the minimum distance they should walk so that each takes exact number of steps?
A और B बिंदू से एक साथ चलना शुरू यकरते हैं। उनके कदमों की माप क्रमश: 72 सेमी और 84 सेमी हैं। वे न्यूनतम कितनी दूरी चलें ताकि प्रत्येक के कदमों की संख्या एकसमान संख्या हो:
(A) 2.7 m (B) 3.54 m
(C) 6.3 m (D) 5.04 m

26. $\sqrt{4+\sqrt{144}}$ is equal to:
$\sqrt{4+\sqrt{144}}$ का मान क्या हैं ?
(A) 3.74 (B) 14
(C) 12.17 (D) 4

27. The product of two numbers is 45360; if the HCF of the numbers is 36, then their LCM is:
दो संख्याओं का गुणनफल 45360 तथा म.स.प. 36 है तो उनका ल.स.प. होगा :
(A) 252 (B) 630
(C) 126 (D) 1260

28. $(-4)\times(-8)\div(-2)+3\times 5$ is equal to :
$(-4)\times(-8)\div(-2)+3\times 5$ का मान होगा :
(A) – 1 (B) 1
(C) 31 (D) – 31

29. A car consumes 5.4 litres of petrol to cover 60.48 km, how many kilometers be covered with 22 litres of petrol ?
एक कार 5.4 लीटर पेट्रोल के उपभोग से 60.48 किमी की दूरी तय करती है, तो 22 लीटर पेट्रोल के साथ कितने किलोमीटर की दूरी तय करेगी ?
(A) 246.4 (B) 238.62
(C) 240.24 (D) 243.5

30. The cube root of 3375 is equal to :
3375 का घनमूल होगा :
(A) 35 (B) 25
(C) 55 (D) 15

31. $\frac{3}{4}+\frac{5}{2}\left[\frac{1}{4}\times\left(\frac{8}{5}-\frac{4}{3}\right)\right]$ is equal to :
$\frac{3}{4}+\frac{5}{2}\left[\frac{1}{4}\times\left(\frac{8}{5}-\frac{4}{3}\right)\right]$ का मान होगा :
(A) $\frac{13}{24}$ (B) $\frac{3}{4}$
(C) $\frac{1}{4}$ (D) $\frac{11}{12}$

32. $10-\{17-12\div(5+9\times 2-17)\}$ is equal to:
$10-\{17-12\div(5+9\times 2-17)\}$ का मान क्या होगा ?
(A) – 5 (B) 5
(C) 7 (D) – 7

33. $13\div\{4 \text{ of } 2-3+4\times(6-4)\}$ is equal to:
$13\div\{4 \text{ of } 2-3+4\times(6-4)\}$ का मान क्या होगा ?
(A) $-2\frac{1}{13}$ (B) 0 (C) 1.3 (D) 1

34. The smallest number that should be added to 8212 to obtain a perfect square is:
एक पूर्ण वर्ग (perfect square) प्राप्त करने के लिए, ₹ 8212 में कौन-सी सबसे छोटी संख्या जोड़ी जानी चाहिए :
(A) 123 (B) 69
(C) 112 (D) 54

35. $\frac{14-6\times 2}{15\div 3+3}$ is equal to:
$\frac{14-6\times 2}{15\div 3+3}$ बराबर है:
(A) 2 (B) $\frac{4}{5}$ (C) $\frac{1}{4}$ (D) $6\frac{2}{5}$

36. $(24\div 6-2)+(3\times 2+4)$ is equal to:
$(24\div 6-2)+(3\times 2+4)$ बराबर है :
(A) 12 (B) 24
(C) 16 (D) 20

37. A, B और C एक बिंदु से एक साथ चलना शुरू करते हैं। उनके कदम क्रमश: 42 cm, 56 cm और 64 cm है। वे न्यूनतम कितनी दूरी तय करे ताकि प्रत्येक के कदमों की संख्या पूर्णांक हो ?
(A) 15.60 m (B) 14.06 m
(C) 14.58 m (D) 13.44 m

38. The product of HCF and LCM two numbers is 3321. If one of the numbers is 369, the HCF of the numbers is:
दो संख्याओं के म.स. (HCF) और (LCM) का गुणनफल 3321 है। यदि संख्याओं में से एक 369 है, तो संख्याओं का म.स. (HCF) है:
(A) 27 (B) 3
(C) 21 (D) 9

39. $15-\{5+24\div(3\times9-15)\}$ is equal to :
$15-\{5+24\div(3\times9-15)\}$ के बराबर है :
(A) – 2 (B) $11\frac{1}{3}$ (C) $6\frac{1}{4}$ (D) 8

40. An oil merchant has 3 varieties of oil of volumes 432, 594 and 702 litres respectively. The number of cans of equal size that would be required to fill the oil separately is :
एक तेल व्यापारी के पास क्रमश: 432, 594 और 702 लीटर के तेल की 3 किस्में हैं। तेल को अलग से भरने के लिए आवश्यक समान आकार के डिब्बे की संख्या है :
(A) 13, 15, 17 (B) 8, 11, 13
(C) 8, 13, 15 (D) 6, 9, 11

41. (– 4) × {1020 ÷ 85 × 3 – 22} is equal to :
(– 4) × {1020 ÷ 85 × 3 – 22} के बराबर है :
(A) – 402 (B) – 56
(C) 912 (D) 72

42. A gardener planted 1936 saplings in a garden such that there were as many rows of saplings as the columns. The number of rows planted is:
एक माली ने एक बगीचे में 1936 पौधे इस तरह लगाता है कि पौधों की पंक्तियों की संख्या व स्तम्भों की संख्या समान हो। तो लगाई गई पंक्तियों की संख्या ज्ञात करें।
(A) 46 (B) 44
(C) 48 (D) 42

43. $\dfrac{0.72\times0.72\times0.72-0.39\times0.39\times0.39}{0.72\times0.72+0.72\times0.39+0.39\times0.39}$
is equal to/ के बराबर होगा ?
(A) 0.39 (B) 0.36
(C) 0.33 (D) 0.45

Solution

1. (D) $\dfrac{a^3+b^3}{a^2+b^2-ab}=a+b$

$\Rightarrow$ $a+b=675+325=1000$

But, $\left[\dfrac{675\times675\times675+325\times325\times325}{(675)^2+(325)^2-(675\times325)}\right]\times100$

$\Rightarrow$ $1000\times100=100000$

2. (A) Ist no. $\rightarrow 16\times4$
IInd no. $\rightarrow 16\times5$
Sum of numbers = 16 (4 + 5) = 16 × 9 = 144

3. (D) $=\dfrac{24}{5}\div\dfrac{3}{7}\times7+\dfrac{4}{5}\times\dfrac{3}{10}-\dfrac{1}{5}$

$=\dfrac{24}{5}\times\dfrac{1}{3}+\dfrac{6}{25}-\dfrac{1}{5}$

$=\dfrac{8}{5}+\dfrac{1}{25}\Rightarrow\dfrac{41}{25}$

4. (D) Ist no. = 26 × 4
IInd no. = 26 × 7
Sum of these no. = 26 × 4 + 26 × 7
= 26 (4 + 7)
= 26 × 11 = 286

5. (D) 1489.96

6. (D) $\dfrac{\left[(5.75)^3+(3.25)^3\right]}{\left[(5.75)^2+(3.25)^2-(5.75\times3.25)\right]\times100}$

$=[5.75+3.25]\times\dfrac{1}{100}$

$=9\times\dfrac{1}{100}=0.09$

7. (B) $\dfrac{35}{6}+\left[\dfrac{8}{3}-\left\{\dfrac{15}{4}\left[\dfrac{19}{5}\div\dfrac{19}{2}\right]\right\}\right]$

$\dfrac{35}{6}+\left[\dfrac{8}{3}-\dfrac{15}{4}\times\dfrac{2}{5}\right]$

$=\dfrac{35}{6}+\dfrac{8}{3}-\dfrac{3}{2}$

$=\dfrac{35+16-9}{6}=\dfrac{42}{6}=7$

8. (C) $\dfrac{16}{5}-\left[\dfrac{5}{2}-\left[\dfrac{5}{6}-\left[\dfrac{2}{5}+\dfrac{3}{10}-\dfrac{4}{15}\right]\right]\right]$

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$$\frac{16}{5}-\left[\frac{5}{2}-\left[\frac{5}{6}-\left[\frac{12+9-8}{30}\right]\right]\right]$$

$$\frac{16}{5}-\left[\frac{5}{2}-\left[\frac{5}{6}-\frac{13}{30}\right]\right]$$

$$\frac{16}{5}-\left[\frac{5}{2}-\frac{12}{30}\right]$$

$$\frac{16}{5}+\frac{12}{30}-\frac{5}{2}=\frac{16}{5}+\frac{6}{15}-\frac{5}{2}$$

$$=\frac{54}{15}-\frac{5}{2}=\frac{33}{30}=\frac{11}{10}$$

9. (A) Number are

5×24, 11×24

Sum of nos. = 24(5+11)

= 24×16

= 384

10. (D) $\dfrac{(6.75)^3-(4.25)^3}{100\times[(6.75)^2+(4.25)^2+(6.75)(4.25)]}$

$\Rightarrow \dfrac{6.75-4.25}{100}$ [Using $a^3-b^3=(a-b)(a^2+b^2+ab)$]

$\Rightarrow \dfrac{2.50}{100}=0.025$

11. (A) $=\dfrac{26}{5}-\left[\dfrac{7}{2}-\left\{\dfrac{5}{6}-\left(\dfrac{7}{10}-\dfrac{4}{15}\right)\right\}\right]$

$=\dfrac{26}{5}-\left[\dfrac{7}{2}-\left\{\dfrac{5}{6}-\dfrac{13}{30}\right\}\right]$

$=\dfrac{26}{5}-\left[\dfrac{7}{2}-\dfrac{12}{30}\right]$

$=\dfrac{26}{5}-\dfrac{93}{30}$

$=\dfrac{63}{30}=\dfrac{21}{10}$

12. (C) $3\dfrac{5}{6}+\left[3\dfrac{2}{3}-\left\{\dfrac{15}{4}\left(5\dfrac{4}{5}\div14\dfrac{1}{5}\right)\right\}\right]$

Using BODMAS Rule

$=\dfrac{23}{6}+\left[\dfrac{11}{3}-\left\{\dfrac{15}{4}\left(\dfrac{29}{5}\div\dfrac{29}{2}\right)\right\}\right]$

$=\dfrac{23}{6}+\left[\dfrac{11}{3}-\left\{\dfrac{15}{4}\left(\dfrac{29}{5}\times\dfrac{2}{29}\right)\right\}\right]$

$=\dfrac{23}{6}+\left[\dfrac{11}{3}-\left\{\dfrac{15}{4}\times\dfrac{2}{5}\right\}\right]$

$=\dfrac{23}{6}+\left[\dfrac{11}{3}-\dfrac{3}{2}\right]=\dfrac{23+22-9}{6}=\dfrac{36}{6}=6$

13. (A) Let both nos. are 6x, 11x

HCF is 28

$\Rightarrow$ x = 28

$\Rightarrow$ both nos. are 6×28, 11×28

$\Rightarrow$ Sum of both nos. are

$= 6\times28+11\times28$

$= 28(6+11)$

$= 28\times17=476$

14. (A) $\dfrac{a^3+b^3}{a^2+b^2-ab}=\dfrac{(a+b)(a^2+b^2-ab)}{a^2+b^2-ab}$

= a + b

Similarly, here

a = 63.5

b = 36.5

$\dfrac{\left[(63.5)^3+(36.5)^3\right]\times100}{\left[(63.5)^2+(36.5)^2-(63.5\times36.5)\right]}=$

([63.5 + 36.5] × 100 = 10000

15. (A) 5535.36

16. (C) $6\dfrac{1}{5}-\left[4\dfrac{1}{2}-\left\{\dfrac{5}{6}-\left(\dfrac{3}{5}+\dfrac{3}{10}-\dfrac{7}{15}\right)\right\}\right]$

$=\dfrac{31}{5}-\left[\dfrac{9}{2}-\left\{\dfrac{5}{6}-\left(\dfrac{18+9-14}{30}\right)\right\}\right]$

Using BODMAS

$=\dfrac{31}{5}-\left[\dfrac{9}{2}-\left\{\dfrac{5}{6}-\dfrac{13}{30}\right\}\right]$

$= \frac{31}{5} - \left[\frac{9}{2} - \frac{12}{30}\right]$

$= \frac{31}{5} - \frac{9}{2} + \frac{6}{15}$

$= \frac{186 - 135 + 12}{30} = \frac{198 - 135}{30} = \frac{63}{30}$

$= \frac{21}{10} = 2.1$

17. (D) $\frac{17}{30} + \left[\frac{16}{5} - \left\{\frac{5}{6} - \left(\frac{19}{5} \div \frac{19}{2}\right)\right\}\right]$

$= \frac{17}{30} + \left[\frac{16}{5} - \left\{\frac{5}{6} - \frac{2}{5}\right\}\right]$

$= \frac{17}{30} + \left[\frac{16}{5} - \frac{5}{6} + \frac{2}{5}\right]$

$= \frac{17}{30} + \frac{18}{5} - \frac{5}{6}$

$= \frac{17 + 108 - 25}{30} = \frac{125 - 25}{30} = \frac{100}{30} = \frac{10}{3}$

18. (B) $3\times3 - [6-\{12 + 15 \div 5\}]$
Using BODMAS
$= 9 - [6 - \{12 + 15 \div 5\}]$
$= 9 - [6 - \{12 + 3\}]$
$= 9 - [6 - 15]$
$= 9 - 6 + 15 \Rightarrow 24 - 6 \Rightarrow 18.$

19. (C) $\frac{1}{3} \div \frac{5}{6} \times \frac{-5}{8}$
Using BODMAS

$\left(\frac{1}{3} \times \frac{6}{5}\right) \times \frac{-5}{8}$

$\frac{2}{5} \times \frac{-5}{8} \Rightarrow \frac{-1}{4}$

20. (B) $(-3)^x = -2187$

$\Rightarrow (-3)^x = (-3)^7$

$\Rightarrow \boxed{x = 7}$

21. (B) As we know,
First No. × Second No. = LCM × HCF
$210 \times b = 6 \times 5040$

$\Rightarrow b = \frac{6 \times 5040}{210}$

$= 144$

22. (A)

23. (D) $7 - (4 \times 3 - (-10) \times 8 \div (-4))$
$= 7 - [12 - (-10) \times (-2)]$
$= 7 - [12 - 20]$
$= 7 + 8$
$= 15$

24. (C) $\frac{3}{5} \times 4\left[7 - \left\{\frac{2}{5} \times (13 + 2)\right\}\right]$
Using BODMAS

$\Rightarrow \frac{3}{5} \times 4\left[7 - \left\{\frac{2}{5} \times 15\right\}\right] \Rightarrow \frac{3}{5} \times 4[7 - 6]$

$\Rightarrow \frac{3}{5} \times 4 = \frac{12}{5} = 2\frac{2}{5}$

25. (D) Required Answer
= LCM (72, 84)
= 504 cm
= 5.04 meter

26. (D) $\sqrt{4 + \sqrt{144}} = \sqrt{4 + 12} = \sqrt{16} = 4$

27. (D) As we know,
Product of both numbers = LCM × HCF
45360 = LCM × 36

$\Rightarrow$ LCM = $\frac{45360}{36} = 1260$

28. (A) $(-4) \times (-8) \div (-2) + 3 \times 5$
Using BODMAS Rule
$(-4) \times (4) + 3 \times 5$
$= -16 + 15$
$= -1$

29. (A) 5.4 Lt. to Cover = 60.48 km.

1 Lt. to Cover = $\frac{60.48}{5.4}$ km.

= 22 Lt. to cover = $\frac{60.48}{5.4} \times 22$ km

= 246.4 km

30. (D) $(15)^3 = 3375$

31. (D) $\frac{3}{4} + \frac{5}{2}\left[\frac{1}{4} \times \left(\frac{8}{5} - \frac{4}{3}\right)\right]$
Using BODMAS

$= \frac{3}{4} + \frac{5}{2}\left[\frac{1}{4} \times \frac{4}{15}\right] = \frac{3}{4} + \frac{5}{2} \times \frac{1}{15}$

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$= \frac{3}{4} + \frac{1}{6} = \frac{11}{12}$

32. (A) $10 - \{17 - 12 \div (5 + 9 \times 2 - 17)\}$
Using BODMAS
$= 10 - \{17 - 12 \div (5 + 18 - 17)\}$
$= 10 - \{17 - 12 \div 6\}$
$= 10 - \{17 - 2\}$
$= 10 - 17 + 2 = -7 + 2 = -5$

33. (D) $13 \div \{4 \text{ of } 2 - 3 + 4 \times (6-4)\}$
$= 13 \div \{4 \times 2 - 3 + 4 \times 2\}$
$= 13 \div \{8 - 3 + 8\}$
$= 13 \div \{13\}$
$= 1$

34. (B) 69
$= 8212 + 69$
$= \sqrt{8281}$
$= 91$

35. (C) $\frac{14 - 6 \times 2}{15 \div 3 + 3} = \frac{14 - 12}{5 + 3}$

$= \frac{2}{8} = \frac{1}{4}$

36. (A) $(24 \div 6 - 2) + (3 \times 2 + 4)$
Using BODMAS
$= (4 - 2) + (6 + 4)$
$= 2 + 10 = 12$

37. (D) Minimum Steps
$= \text{LCM}(42, 56, 64)$
$= 1344$ cm
$= 13.44$ m

38. (D) As we know,
Multiplication of number = LCM × HCF
$369 \times b = 3321$
$b \rightarrow$ Second unknown number

$\Rightarrow b = \frac{3321}{369} = 9$

39. (D) $15 - \{5 + 24 \div (3 \times 9 - 15)\}$
$15 - \{5 + 24 \div (12)\}$
$15 - (7) = 8$

40. (B) HCF of (432, 594, 702) = 54
Required number of cars

$= \frac{432}{54} = 8, \frac{594}{54} = 11, \frac{702}{54} = 13$

41. (B) $(-4) \times \{1020 \div 85 \times 3 - 22\}$
$-4 \times \{12 \times 3 - 22\}$
$-4 \times 14 \Rightarrow -56$

42. (B) Let no. of rows = no. of columns = x
$\Rightarrow x^2 = 1936$
$\Rightarrow x = 44$

43. (C) $\frac{a^3 - b^3}{a^2 + b^2 + ab} = \frac{(a-b)(a^2 + b^2 + ab)}{a^2 + b^2 + ab}$
$= a - b$
$\Rightarrow$ Here, $a = (0.72)^3$, $b = (0.39)^3$
$\Rightarrow$ Required Answer $= 0.72 - 0.39$
$= 0.33$

Simplification (CPO — 2017)

1. If $N = (\sqrt{7} - \sqrt{3})/(\sqrt{7} + \sqrt{3})$, then what is the value of $N + (1/N)$?
यदि $N = (\sqrt{7} - \sqrt{3})/(\sqrt{7} + \sqrt{3})$ है, तो $N + (1/N)$ का मान क्या होगा ?
(A) $2\sqrt{2}$ (B) 5
(C) 10 (D) 13

2. What is the simplified value of $(2 + 1)(2^2 + 1)(2^4 + 1)(2^8 + 1)$?
$(2 + 1)(2^2 + 1)(2^4 + 1)(2^8 + 1)$ का सरलीकृत मान क्या है ?
(A) 2^8-1 (B) $2^{16}-1$
(C) $2^{32}-1$ (D) $2^{64}-1$

3. Which one among $\sqrt{10}+\sqrt{4}$, $\sqrt{11}+\sqrt{3}$, $\sqrt{7}+\sqrt{7}$ is the smallest number?
$\sqrt{10}+\sqrt{4}$, $\sqrt{11}+\sqrt{3}$, $\sqrt{7}+\sqrt{7}$ में सबसे छोटी संख्या कौन सी है ?
(A) $\sqrt{10}+\sqrt{4}$
(B) $\sqrt{11}+\sqrt{3}$
(C) $\sqrt{7}+\sqrt{7}$
(D) All are equal/सभी बराबर हैं

4. What is the value of $2^2 + 6^2 + 10^2 + 14^2 - 1^2 - 5^2 - 9^2 - 13^2$?
$2^2 + 6^2 + 10^2 + 14^2 - 1^2 - 5^2 - 9^2 - 13^2$ का मान क्या है ?
(A) 0 (B) 15
(C) 30 (D) 60

5. If $N = (\sqrt{6} - \sqrt{5})/(\sqrt{6} + \sqrt{5})$, then what is the value of $N + (1/N)$?
यदि $N = (\sqrt{6} - \sqrt{5})/(\sqrt{6} + \sqrt{5})$ है, तो $N + (1/N)$ का मान क्या है ?
(A) 10 (B) 11
(C) 12 (D) 22

6. What is the simplified value of $(3 + 1)(3^2 + 1)(3^4+1)(3^8+1)(3^{16}+1)$?
$(3 + 1)(3^2 + 1)(3^4+1)(3^8+1)(3^{16}+1)$ का सरलीकृत मान क्या है ?
(A) $(3^{32}-1)/2$ (B) $(3^{16}-1)/2$
(C) $(3^{64}-1)/2$ (D) $(3^{128}-1)/2$

7. Which value among $\sqrt{11} + \sqrt{5}$, $\sqrt{14} + \sqrt{2}$, $\sqrt{8} + \sqrt{8}$ is the largest?
$\sqrt{11} + \sqrt{5}$, $\sqrt{14} + \sqrt{2}$, $\sqrt{8} + \sqrt{8}$ में सबसे बड़ी संख्या कौन सी है ?
(A) $\sqrt{11} + \sqrt{5}$
(B) $\sqrt{14} + \sqrt{2}$
(C) $\sqrt{8} + \sqrt{8}$
(D) All are equal/सभी बराबर हैं

8. What is the value of $\dfrac{(0.5)^3 - (0.1)^3}{(0.5)^2 + 0.5 \times 0.1 + (0.1)^2}$?
$\dfrac{(0.5)^3 - (0.1)^3}{(0.5)^2 + 0.5 \times 0.1 + (0.1)^2}$ का मान क्या है ?
(A) 0.1 (B) 0.4
(C) 0.5 (D) 0.6

9. If $P = \dfrac{(\sqrt{7} - \sqrt{6})}{(\sqrt{7} + \sqrt{6})}$, then what is the value of $P + (1/P)$?
यदि $P = \dfrac{(\sqrt{7} - \sqrt{6})}{(\sqrt{7} + \sqrt{6})}$ है, तो $P + (1/P)$ का मान क्या होगा ?
(A) 12 (B) 13
(C) 24 (D) 26

10. Which value among 3^{200}, 2^{300} and 7^{100} is the largest?
3^{200}, 2^{300} और 7^{100} में सबसे बड़ी संख्या कौन सी है ?
(A) 3^{200} (B) 2^{300}
(C) 7^{100} (D) All are equal

11. What is the value of $3^2 + 7^2 + 11^2 + 13^2 + 17^2 - 1^2 - 5^2 - 9^2 - 11^2 - 15^2$?
$3^2 + 7^2 + 11^2 + 13^2 + 17^2 - 1^2 - 5^2 - 9^2 - 11^2 - 15^2$ का मान क्या है ?
(A) 5 (B) 72
(C) 92 (D) 184

12. What is the value of $\dfrac{(0.7)^3 - (0.4)^3}{(0.7)^2 + 0.7 \times 0.4 + (0.4)^2}$?
$\dfrac{(0.7)^3 (0.4)^3}{(0.7)^3 + 0.7 \times 0.4 + (0.4)^2}$ का मान क्या है ?

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(A) 0.3 (B) 0.4
(C) 0.7 (D) 1.1

13. If $1/N = (\sqrt{6} + \sqrt{5})/(\sqrt{6} - \sqrt{5})$, then what is the value of N?
यदि $1/N = (\sqrt{6} + \sqrt{5})/(\sqrt{6} - \sqrt{5})$ है, तो N का मान क्या है ?

(A) $6 - \sqrt{30}$ (B) $6 + \sqrt{30}$
(C) $11 - 2\sqrt{30}$ (D) $11 + 2\sqrt{5}$

14. What is the value of positive square root of $69 + 28\sqrt{5}$?
$69 + 28\sqrt{5}$ का धनात्मक वर्गमूल का मान क्या है ?

(A) $7 + 2\sqrt{5}$ (B) $7 - 2\sqrt{5}$
(C) $2 + 7\sqrt{5}$ (D) $2 - 7\sqrt{5}$

15. $3^{11} + 3^{12} + 3^{13} + 3^{14}$ is divisible by _____.
$3^{11} + 3^{12} + 3^{13} + 3^{14}$ _____ से विभाज्य है।
(A) 7 (B) 8
(C) 11 (D) 14

16. Which value among $\sqrt[4]{7}$, $\sqrt[3]{11}$ and $\sqrt[12]{1257}$ is the largest?
$\sqrt[4]{7}$, $\sqrt[3]{11}$ तथा $\sqrt[12]{1257}$ में सबसे बड़ी संख्या कौन सी है ?

(A) $\sqrt[3]{11}$ (B) $\sqrt[4]{7}$
(C) $\sqrt[12]{1257}$ (D) All are equal

17. What is the value of

$$\sqrt{1+\frac{1}{2^2}+\frac{1}{3^2}}+\sqrt{1+\frac{1}{3^2}+\frac{1}{4^2}}+\sqrt{1+\frac{1}{4^2}+\frac{1}{5^2}}\ ?$$

$\sqrt{1+\frac{1}{2^2}+\frac{1}{3^2}}+\sqrt{1+\frac{1}{3^2}+\frac{1}{4^2}}+\sqrt{1+\frac{1}{4^2}+\frac{1}{5^2}}$ का मान क्या है ?

(A) $\frac{18}{5}$ (B) $\frac{4}{3}$ (C) $\frac{7}{3}$ (D) $\frac{33}{10}$

18. What is the value of $(203 + 107)^2 - (203 - 107)^2$?
$(203 + 107)^2 - (203 - 107)^2$ का मान क्या है ?
(A) 85886 (B) 86884
(C) 43442 (D) 87884

19. $4^{11} + 4^{12} + 4^{13} + 4^{14}$ is divisible by _____.
$4^{11} + 4^{12} + 4^{13} + 4^{14}$ _____ से विभाजित होगा।
(A) 7 (B) 14
(C) 17 (D) 9

20. What is the value of $\frac{(1.1)^3 + (0.7)^3}{(1.1)^2 - 1.1 \times 0.7 + (0.7)^2}$?

$\frac{(1.1)^3 + (0.7)^3}{(1.1)^2 - 1.1 \times 0.7 + (0.7)^2}$ का मान क्या है ?

(A) 0.4 (B) 0.7
(C) 1.1 (D) 1.8

21. What is the value of $999\frac{1}{2} + 999\frac{1}{6} + 999\frac{1}{12} + 999\frac{1}{20} + 999\frac{1}{30}$?

$999\frac{1}{2} + 999\frac{1}{6} + 999\frac{1}{12} + 999\frac{1}{20} + 999\frac{1}{30}$ का मान क्या होगा ?

(A) $999\frac{1}{6}$ (B) $999\frac{5}{6}$
(C) $4995\frac{1}{6}$ (D) $4995\frac{5}{6}$

22. If $N = (\sqrt{7} - \sqrt{5})/(\sqrt{7} + \sqrt{5})$, then what is the value of $1/N$?
यदि $N = (\sqrt{7} - \sqrt{5})/(\sqrt{7} + \sqrt{5})$ है, तो $1/N$ का मान क्या है ?

(A) $6 - \sqrt{35}$ (B) $6 + \sqrt{35}$
(C) $7 + \sqrt{35}$ (D) $7 - \sqrt{35}$

23. What is the value of

$111\frac{1}{2} + 111\frac{1}{6} + 111\frac{1}{12} + 111\frac{1}{20} + 111\frac{1}{30}$?

$111\frac{1}{2} + 111\frac{1}{6} + 111\frac{1}{12} + 111\frac{1}{20} + 111\frac{1}{30}$ का मान क्या होगा ?

(A) $111\frac{1}{6}$ (B) $111\frac{5}{6}$
(C) $555\frac{5}{6}$ (D) $555\frac{1}{6}$

24. If $N = (\sqrt{8} + \sqrt{6})/(\sqrt{8} - \sqrt{6})$, then what is the value of $N - (1/N)$?
यदि $N = (\sqrt{8} + \sqrt{6})/(\sqrt{8} - \sqrt{6})$ है, तो $N - (1/N)$ का मान क्या होगा ?

(A)$8\sqrt{3}$ (B)14
(C)7 (D)0

25. Which one among $\sqrt[3]{6}$, $\sqrt[2]{5}$ and $\sqrt[6]{12}$ is the largest?
$\sqrt[3]{6}$, $\sqrt[2]{5}$ तथा $\sqrt[6]{12}$ में से सबसे बड़ा कौन है ?
(A) $\sqrt[3]{6}$ (B) $\sqrt[2]{5}$
(C) $\sqrt[6]{12}$ (D) All are equal/सभी बराबर हैं

26. What is the value of positive square root of $14 + 6\sqrt{5}$?
$14 + 6\sqrt{5}$ का धनात्मक वर्गमुल का मान क्या है ?
(A)$3+\sqrt{5}$ (B)$3-\sqrt{5}$
(C)$5+\sqrt{3}$ (D)$5-\sqrt{3}$

27. What is the value of $\frac{(0.7)^3+(0.3)^3}{(0.7)^2-0.7\times0.3+(0.3)^2}$?
$\frac{(0.7)^3+(0.3)^3}{(0.7)^2-0.7\times0.3+(0.3)^2}$ का मान क्या है ?
(A) 2.2 (B) 0.8 (C)1 (D) 1.4

28. If $x=7+2\sqrt{10}$, then what is the value of $\sqrt{x}+\frac{1}{\sqrt{x}}$?
यदि $x=7+2\sqrt{10}$ हो, तो $\sqrt{x}+\frac{1}{\sqrt{x}}$ का मान क्या है ?
(A) $2\sqrt{2}$ (B) $\frac{2}{3}\left(2\sqrt{5}+\sqrt{2}\right)$
(C) $-2\sqrt{2}$ (D) $\frac{2}{3}\left(2\sqrt{2}+\sqrt{5}\right)$

29. Which of the following relation(s) is/are true?
निम्नलिखित में से कौन सा/से संबंध सही है/ हैं ?
I. $\sqrt{7}+\sqrt{3}>\sqrt{5}+\sqrt{5}$
II. $\sqrt{5}+\sqrt{5}>\sqrt{2}+\sqrt{8}$
III. $\sqrt{5}+\sqrt{5}>\sqrt{7}+\sqrt{3}$
(A) Only/केवल I
(B) Only II and III/केवल II तथा III दोनों
(C) Only I and III/केवल I तथा III दोनों
(D) All I, II and III/I, II तथा III सभी

30. If $a = 1+\sqrt{3}$, $b = 1-\sqrt{3}$, then what is the value of $a^2 + b^2$?
यदि $a = 1+\sqrt{3}$, $b = 1-\sqrt{3}$ हो, तो $a^2 + b^2$ का मान क्या है ?
(A) 4 (B) 8
(C) 0 (D) 2

31. What is the unit's place of 12^{123}?
12^{123} का इकाई अंक क्या है ?
(A) 2 (B) 4
(C) 6 (D) 8

32. If $(3+2\sqrt{5})^2 = 29 + K\sqrt{5}$, then what is the value of K?
यदि $(3+2\sqrt{5})^2 = 29 + K\sqrt{5}$ हो, तो K का मान क्या है ?
(A) 12 (B) 6
(C) 29 (D) 39

33. what is the simplified value of $3+\sqrt{3}+\frac{1}{3-\sqrt{3}}+\frac{1}{3+\sqrt{3}}$?
$3+\sqrt{3}+\frac{1}{3-\sqrt{3}}+\frac{1}{3+\sqrt{3}}$ का सरलीकृत मान क्या है ?
(A) $2+\sqrt{3}$ (B) $2-\sqrt{3}$
(C) $4-\sqrt{3}$ (D) $4+\sqrt{3}$

34. If $x=5+2\sqrt{6}$ then what is the value of $\sqrt{x}+\frac{1}{\sqrt{x}}$?
यदि $x=5+2\sqrt{6}$ हो, तो $\sqrt{x}+\frac{1}{\sqrt{x}}$ का मान क्या है ?/ ?
(A) $2\sqrt{3}$ (B) $3\sqrt{2}$
(C) $2\sqrt{6}$ (D) $6\sqrt{2}$

35. Which of the following relation(s) is/are true?
I. $3^{33} > 33^3$
II. $33^3 > 333$
III. $3^{33} > 333$
निम्नलिखित में से कौन सा/से संबंध सही है/ हैं ?
(A) Only I and II/केवल I तथा II
(B) Only II and III/केवल II तथा III
(C) Only/केवल II
(D) All I, II and III/सभी I, II तथा III

36. Which of the following expression(s) is/are true?

I. $\sqrt{5} + \sqrt{5} > \sqrt{2} + \sqrt{8}$

II. $\sqrt{3} + \sqrt{7} > \sqrt{2} + \sqrt{8}$

III. $\sqrt{5} + \sqrt{5} > \sqrt{3} + \sqrt{7}$

निम्नलिखित में से कौन सा/कौन से व्यंजक सही है/ हैं ?

(A) Only I/केवल I

(B) Only I and III/केवल I और III

(C) Only II/केवल II

(D) All expressions are true/सभी व्यंजक सही हैं

37. Which value among $\sqrt[3]{8}$, $\sqrt[2]{4}$, $\sqrt[6]{64}$ is greatest?

$\sqrt[3]{8}$, $\sqrt[2]{4}$, $\sqrt[6]{64}$ में से सबसे बड़ी संख्या कौन सी है ?

(A) $\sqrt[3]{8}$ (B) $\sqrt[2]{4}$ (C) $\sqrt[6]{64}$

(D) All are equal/सभी बराबर हैं

38. What is the value of $(1004)^2 - (998)^2$?

$(1004)^2 - (998)^2$ का मान क्या है ?

(A) 11012 (B) 12012

(C) 120012 (D) 1212

39 If $165^2 = 27225$, then what is the value of $\sqrt{272.25} + \sqrt{2.7225} + \sqrt{0.027225}$?

यदि $165^2 = 27225$ है, तो $\sqrt{272.25} + \sqrt{2.7225} + \sqrt{0.027225}$ का मान क्या है ?

(A) 12.25 (B) 34.65

(C) 19.8 (D) 18.315

40. What is the value of $\sqrt{37+20\sqrt{3}} - \sqrt{61+28\sqrt{3}}$?

$\sqrt{37+20\sqrt{3}} - \sqrt{61+28\sqrt{3}}$ का मान क्या है ?

(A) –1 (B) 1

(C) 2 (D) –2

41. Which of the following relation(s) is/are false?

I. $(27)^{1/3} > (13)^{1/2} < (47)^{1/6}$

II. $(23)^{1/3} < (49)^{1/2} < (52)^{1/6}$

III. $(53)^{1/6} < (41)^{1/3} < (37)^{1/2}$

(A) Only III / केवल III

(B) Both I and II / दोनों I और II

(C) II and III only / II तथा III

Solution

1. (B) $N = \dfrac{\left(\sqrt{7}-\sqrt{3}\right)}{\left(\sqrt{7}+\sqrt{3}\right)}$

then $\dfrac{1}{N} = \dfrac{\left(\sqrt{7}+\sqrt{3}\right)}{\left(\sqrt{7}-\sqrt{3}\right)}$

$N + \dfrac{1}{N} = \dfrac{\left(\sqrt{7}-\sqrt{3}\right)}{\left(\sqrt{7}+\sqrt{3}\right)} + \dfrac{\left(\sqrt{7}+\sqrt{3}\right)}{\left(\sqrt{7}-\sqrt{3}\right)}$

$= \dfrac{\left(\sqrt{7}-\sqrt{3}\right)^2 + \left(\sqrt{7}+\sqrt{3}\right)^2}{\left(\sqrt{7}+\sqrt{3}\right)\left(\sqrt{7}-\sqrt{3}\right)}$

$= \dfrac{20}{4}$

$= 5$

2. (B) $(2 + 1)(2^2 + 1)(2^4 + 1)(2^8 + 1)$

Multiply $\dfrac{(2-1)}{(2-1)}$

$\dfrac{1}{(2-1)}\left[(2-1)(2+1)\left(2^2+1\right)\left(2^4+1\right)\left(2^8+1\right)\right]$

$= (2^2 - 1)(2^2 + 1)(2^4 + 1)(2^8 + 1)$

$= (2^4 - 1)(2^4 + 1)(2^8 + 1)$

$= (2^8 - 1)(2^8 + 1)$

$= (2^{16} - 1)$

3. (B) $\left(\sqrt{10}+\sqrt{4}\right)^2 = 14 + 2\sqrt{40}$

$= 14 + 2\sqrt{40}$

$\left(\sqrt{11}+\sqrt{3}\right)^2 = 14 + 2\sqrt{33}$

$= \left(\sqrt{7}+\sqrt{7}\right)^2 = 14 + 2\sqrt{49}$

4. (D) $2^2 + 6^2 + 10^2 + 14^2 - 1^2 - 5^2 - 9^2 - 13^2$

$2^2 - 1^2 + 6^2 - 5^2 + 10^2 - 9^2 + 14^2 - 13^2$

$(2 + 1)(2-1) + (6 + 5)(6 - 5) + (10 + 9)(10 - 9)$

$+ (14 + 13)(14 - 13)$

$3 + 11 + 19 + 27$

$= 60$

5. (D) $N = \dfrac{\left(\sqrt{6}-\sqrt{5}\right)}{\left(\sqrt{6}+\sqrt{5}\right)}$

$N + \frac{1}{N} = ?$

$\frac{1}{N} = \frac{(\sqrt{6}+\sqrt{5})}{(\sqrt{6}-\sqrt{5})}$

$N + \frac{1}{N} = \frac{(\sqrt{6}-\sqrt{5})}{(\sqrt{6}+\sqrt{5})} + \frac{(\sqrt{6}+\sqrt{5})}{(\sqrt{6}-\sqrt{5})}$

$= \frac{(\sqrt{6}-\sqrt{5})^2 + (\sqrt{6}+\sqrt{5})^2}{(\sqrt{6}+\sqrt{5})(\sqrt{6}-\sqrt{5})}$

$= \frac{6+5+2\sqrt{30}+6+5+2\sqrt{30}}{1} = 22$

6. (A) $(3 + 1)(3^2 + 1)(3^4 + 1)(3^8 + 1)(3^{16} + 1)$ .... (i)

Eqn. (1) multiply and divided $(3 - 1)$

$= \frac{(3^2 - 1)(3^4 + 1)(3^8 + 1)(3^{16} + 1)}{(3 - 1)}$

$= \frac{1}{2}(3^4 - 1)(3^4 + 1)(3^8 + 1)(3^{16} + 1)$

$= \frac{1}{2}(3^8 - 1)(3^8 + 1)(3^{16} + 1)$

$= \frac{1}{2}(3^{16} - 1)(3^{16} + 1) = \frac{(3^{32} - 1)}{2}$

7. (C) $\sqrt{11}+\sqrt{5}, \sqrt{14}+\sqrt{2}, \sqrt{8}+\sqrt{8}$

$(\sqrt{11}+\sqrt{5})^2 = 16 + 2\sqrt{55}$

$(\sqrt{14}+\sqrt{2})^2 = 16 + 2\sqrt{28}$

$(\sqrt{8}+\sqrt{8})^2 = 16 + 2\sqrt{64}$

$= 32$

8. (B) $\frac{(0.5)^3 - (0.1)^3}{(0.5)^2 + 0.5 \times 0.1 + (0.1)^2}$

$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

$= \frac{(0.5 - 0.1)\left[(0.5)^2 + 0.5 \times 0.1 + (0.1)^2\right]}{(0.5)^2 + 0.5 \times 0.1 + (0.1)^2}$

$= (0.5 - 0.1)$

$= 0.4$

9. (D) $P = \frac{\sqrt{7}-\sqrt{6}}{\sqrt{7}+\sqrt{6}}$

$P + \frac{1}{P} = \frac{\sqrt{7}-\sqrt{6}}{\sqrt{7}+\sqrt{6}} + \frac{\sqrt{7}+\sqrt{6}}{\sqrt{7}-\sqrt{6}}$

$= \frac{7+6-2\sqrt{42}+7+6+2\sqrt{42}}{1}$

$P + \frac{1}{P} = 26$

10. (A) $3^{200}, 2^{300}, 7^{100}$

$(9)^{100}, (8)^{100}, (7)^{100}$

$(3^{200} > 2^{300} > 7^{100}$

11. (D) $3^2 + 7^2 + 11^2 + 13^2 + 17^2 - 1^2 + 5^2 - 9^2 - 11^2 - 15^2$

$9 + 49 + 121 + 169 + 289 - 1 - 25 - 81 - 121 - 225$

$516 - 332 = 184$

12. (A) $\frac{(0.7)^3 + (0.4)^3}{(0.7)^2 + 0.7 \times 0.4 + (0.4)^2}$

$\frac{(0.3) + \left[(0.7)^2 + 0.7 \times 0.4 + (0.4)^2\right]}{(0.7)^2 + (0.7 \times 0.4) + (0.4)^2}$

$[a^3 - b^3 = (a - b)(a^2 + ab + b^2)]$

$= 0.3$

13. (C) $\frac{1}{N} = \frac{(\sqrt{6}+\sqrt{5})}{(\sqrt{6}-\sqrt{5})}$

then,

$N = \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} \times \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}-\sqrt{5}}$

$\frac{6 - \sqrt{30} - \sqrt{30} + 5}{6 - \sqrt{30} + \sqrt{30} - 5}$

$= 11 - 2\sqrt{30}$

14. (A)

15. (B) $3^{11} + 3^{12} + 3^{13} + 3^{14}$

$3^{11}(1 + 3^1 + 3^2 + 3^3)$

$3^{11} \times 40 \rightarrow$ Divided by 8

16. (A) $\sqrt[4]{7}, \sqrt[3]{11}, \sqrt[12]{1257}$

$(7)^{\frac{12}{3}} . (11)^{\frac{12}{4}} (1257)^{\frac{12}{12}}$

$(7)^3, (11)^4, (1257)^1$

343, 14641, 1257

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17. (D) $\sqrt{1+\frac{1}{4}+\frac{1}{9}}+\sqrt{1+\frac{1}{9}+\frac{1}{16}}+\sqrt{1+\frac{1}{16}+\frac{1}{25}}$

$\sqrt{\frac{49}{36}}+\sqrt{\frac{169}{144}}+\sqrt{\frac{441}{400}}$

$\frac{7}{6}+\frac{13}{12}+\frac{21}{20}=\frac{33}{10}$

18. (B) $(203+107)^2-(203-107)^2$

$203^2+107^2+2+203\times107-230^2-107^2+2\times107\times203=86884$

19. (C) $4^{11}+4^{12}+4^{13}+4^{14}$

$4^{11}[1+4+16+64]$

$4^{11}\times85$

$\therefore$ 85 is completly divided by 17

20. (D) $a^3+b^3=(a+b)(a^2+b^2-ab)$

$\frac{(1.1)^3+(0.7)^3}{(1.1)^2-1.1\times0.7+(0.7)^2}$

$\frac{a^3+b^3}{a^2-ab+b^2}=\frac{(a+b)(a^2+b^2-ab)}{(a^2-ab+b^2)}$

$=a+b=1.1+0.7=1.8$

21. (D) $999\frac{1}{2}+999\frac{1}{6}+999\frac{1}{12}+999\frac{1}{20}+999\frac{1}{30}$

$(999+999+999+999+999)+\left(\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}\right)$

$4995+\left(\frac{30+10+5+3+2}{60}\right)$

$4995+\frac{50}{60}=4995\frac{5}{6}$

22. (B) $N=\frac{(\sqrt{7}-\sqrt{5})}{\sqrt{7}+\sqrt{5}}$, $\frac{1}{N}=?$

$\frac{1}{N}=\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}}\times\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}+\sqrt{5}}=\frac{12+2\sqrt{35}}{7-5}$

$\frac{1}{N}=6+\sqrt{35}$

23. (C) $(111\times5)+\left(\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}\right)$

$(555)+\left(\frac{30+10+5+3+2}{60}\right)$

$555\frac{5}{6}$

24. (A) $N=\frac{(\sqrt{8}+\sqrt{6})}{\sqrt{8}-\sqrt{6}}$

Find out $N-\frac{1}{N}=?$

So that $\frac{1}{N}=\frac{\sqrt{8}-\sqrt{6}}{\sqrt{8}+\sqrt{6}}$

$N-\frac{1}{N}=\frac{\sqrt{8}+\sqrt{6}}{\sqrt{8}-\sqrt{6}}-\frac{\sqrt{8}-\sqrt{6}}{\sqrt{8}+\sqrt{6}}$

$=\frac{(\sqrt{8}+\sqrt{6})^2-(\sqrt{8}-\sqrt{6})^2}{2}=\frac{16\sqrt{3}}{2}=8\sqrt{3}$

25. (B) $3\sqrt{6},\ 2\sqrt{5},6\sqrt{12}$

L.C.M. = 6

$(6)^{\frac{1}{3}},\ (5)^{\frac{1}{2}},\ (12)^{\frac{1}{6}}$

So that,

$(6)^2, (5)^3, (12)^1$

36, 125, 12

26. (A) $14+6\sqrt{5}=?$

$(9+5+6\sqrt{5})$

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

27. (C) $\frac{(0.7)^3+(0.3)^3}{(0.7)^2-0.7\times0.3+(0.3)^2}$

$a^3+b^3=(a+b)(a^2-ab+b^2)$

So that

$\frac{(0.7+0.3)[(0.7)^2-0.7\times0.3+(0.3)^2]}{(0.7)^2-0.7\times0.3+(0.3)^2}$

$=0.7+0.3=1$

28. (B) $x=7+2\sqrt{10}$

$\sqrt{x}=\sqrt{7+2\sqrt{10}}$

$\sqrt{x}=\sqrt{5}+\sqrt{2}$ and $\frac{1}{x}\Rightarrow\frac{1}{\sqrt{5}+\sqrt{2}}\times\frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}-\sqrt{2}}$

$=\frac{\sqrt{5}-\sqrt{2}}{3}$

A.T.Q.

$\sqrt{x}-\frac{1}{\sqrt{x}}$

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

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

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

29. (B) I = $\sqrt{7}+\sqrt{3}\Rightarrow\sqrt{5}+\sqrt{5}$ Both side square

$=\left(\sqrt{7}+\sqrt{3}\right)^2>\left(\sqrt{5}+\sqrt{5}\right)^2$

$=7+3+2\sqrt{10}>5+5+2\sqrt{25}$

$=10+2\sqrt{10}\neq10+2\sqrt{25}$

So statement (i) is incorrect

Equation II = $\sqrt{5}+\sqrt{5}>\sqrt{2}+\sqrt{8}$

$\left(\sqrt{5}+\sqrt{5}\right)^2>\left(\sqrt{2}+\sqrt{8}\right)^2$

$=5+5+2\sqrt{25}>2+8+8$

$=20>18$

$\sqrt{5}+\sqrt{5}>\sqrt{7}+\sqrt{3}$ Both side Square

$=5+5+2\sqrt{25}>7+3+2\sqrt{21}$

$=20>10+2\sqrt{21}$

30. (B) $a=1+\sqrt{3}, b=1-\sqrt{3}$

A.T.Q.

$a+b=1+\sqrt{3}+1-\sqrt{3}$ or $ab=(1+\sqrt{3})(1-\sqrt{3})$

$ab=-2$

$a+b=2$ Both side square

$(a+b)^2=(2)^2$

$a^2+b^2+2ab=4$

$a^2+b^2+2\times(-2)=4$

$a^2+b^2=8$

31. (D) $(12)^{123}$ Unit Digit $(2)^3$ unit digit

$2^1=2$

$2^2=4$

$2^3=8$

$2^4=16$

This cycle will continue

Divided the power by 4 = $\frac{123}{4}$ =Remainder is = 3 = Unit digit = 8

32. (A) $\left(3+2\sqrt{5}\right)^2=29\times12\sqrt{5}$

A.T.Q.

$\left(3+2\sqrt{5}\right)^2=9+20+12\sqrt{5}$

$\left(3+2\sqrt{5}\right)^2=29+12\sqrt{5}$

Then k = 12

33. (D) $3+\sqrt{3}+\frac{1}{3-\sqrt{3}}+\frac{1}{3+\sqrt{3}}$

$=3+\sqrt{3}+\left[\left(\frac{1}{3-\sqrt{3}}\times\frac{3+\sqrt{3}}{3+\sqrt{3}}\right)+\left(\frac{1}{3+\sqrt{3}}\times\frac{3-\sqrt{3}}{3-\sqrt{3}}\right)\right]$

$=3+\sqrt{3}+\left[\left(\frac{3+\sqrt{3}}{6}+\frac{3-\sqrt{3}}{6}\right)\right]$

$=3+\sqrt{3}+\left[\frac{3+\sqrt{3}+3-\sqrt{3}}{6}\right]$

$=4+\sqrt{3}$

34. (A) $x=5+2\sqrt{6}$

$\sqrt{x}=\sqrt{5+2\sqrt{6}}$

$\sqrt{x}=\left(\sqrt{3}+\sqrt{2}\right)$

and $\frac{1}{\sqrt{x}}=\frac{1}{\sqrt{3}+\sqrt{2}}\times\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

A.T.Q.

$=\sqrt{x}+\frac{1}{\sqrt{x}}$

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

35. (D) Eq. I = $33^3>33^3$

$(3^{11})^3>33^3$

as $3^{11}>33$ So $(3^{11})^3>(33)^3$

Eq. II = $33^3>333$

Eq. III = $3^{33}>333$

$(3^{11})^3>333$

36. (D) Eq. I $\sqrt{5}+\sqrt{5}>\sqrt{2}+\sqrt{8}$

Both side square

$\left(\sqrt{5}+\sqrt{5}\right)^2>\left(\sqrt{2}+\sqrt{8}\right)^2$

$5+5+2\sqrt{25}>2+8+2\sqrt{16}$

$20>18$

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Eq. II $\sqrt{3}+\sqrt{7}>\sqrt{2}+\sqrt{8}$

Both side square

$\left(\sqrt{3}+\sqrt{7}\right)^2>\left(\sqrt{2}+\sqrt{8}\right)^2$

$3+7+2\sqrt{21}>2+8+2\sqrt{16}$

$10+2\sqrt{21}>18$

Eq. III $\sqrt{5}+\sqrt{5}>\sqrt{3}+\sqrt{7}$

Both side square

$\left(\sqrt{5}+\sqrt{5}\right)^2>\left(\sqrt{3}+\sqrt{7}\right)^2$

$5+5\ 2\sqrt{25}>3+7+2\sqrt{21}$

$20>10+2\sqrt{21}$

37. (D) $\sqrt[3]{8},\ \sqrt[2]{4},\ \sqrt[6]{64}$

A.T.Q.

LCM – 6

$8^{\frac{1}{3}\times 6}=64$

$4^{\frac{1}{2}\times 6}=64$

$64^{\frac{1}{6}\times 6}=64$

38. (B) $(1004)^2-(998)^2$

$\therefore a^2-b^2=(a+b)(a-b)$

$(1004+998)(1004-998)$

$(2002)(6)=12012$

39. (D) $\sqrt{272.25}+\sqrt{2.7225}+\sqrt{0.027225}$

$=16.5+1.65+.165=18.315$

40. (D) $\sqrt{37+20\sqrt{3}}-\sqrt{61+28\sqrt{3}}$

$=\sqrt{(5)^2+\left(\sqrt{12}\right)^2}-\sqrt{7^2+\left(\sqrt{12}\right)^2}$

$=5+\sqrt{12}-7-\sqrt{12}$

$=-2$

41. (B) Eq. I = $(27)^{\frac{1}{3}}>(13)^{\frac{1}{2}}<(47)^{\frac{1}{6}}$ L.C.M. = 6

$(27)^{\frac{1}{3}\times 6}>(13)^{\frac{1}{2}\times 6}<(47)^{\frac{1}{6}\times 6}$

$27^2>13^3<47$ = False

Eq. II = $(23)^{\frac{1}{3}}<(49)^{\frac{1}{2}}<(52)^{\frac{1}{6}}$ L.C.M. = 6

$(23)^{\frac{1}{3}\times 6}<(49)^{\frac{1}{2}\times 6}<(52)^{\frac{1}{6}\times 6}$

$23^2<49^3<52$ = False

Eq. III = $(53)^{\frac{1}{6}}<(41)^{\frac{1}{3}}<(37)^{\frac{1}{2}}$ L.C.M. = 6

$(53)^{\frac{1}{6}\times 6}<(41)^{\frac{1}{3}\times 6}<(37)^{\frac{1}{2}\times 6}$

$53>41^2<37^3$ = True

Simplification (MAINS — 2020)

1. The value of $\left(1\frac{1}{3} \div 2\frac{6}{7} \text{ of } 5\frac{3}{5}\right) \times \left(6\frac{2}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3}\right) \div \left(\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9} \text{ of } 1\frac{1}{5}\right) = k$, where k lies between:

$\left(1\frac{1}{3} \div 2\frac{6}{7} \text{ of } 5\frac{3}{5}\right) \times \left(6\frac{2}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3}\right) \div \left(\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9} \text{ of } 1\frac{1}{5}\right) = k$ है, जहाँ k का मान _____ के मध्य स्थित है।

(A) 0.07 and 0.08
(B) 0.007 and 0.008
(C) 0.0007 and 0.0008
(D) 0.7 and 0.8

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

$\left(2\frac{6}{7} \text{ of } 4\frac{1}{5} \div \frac{2}{3}\right) \times 5\frac{1}{9} \div \left(\frac{3}{4} \times 2\frac{2}{3} \text{ of } \frac{1}{2} \div \frac{1}{4}\right)$ का मान ज्ञात करें।

(A) 25 (B) 19
(C) 23 (D) 21

3. The value of $\frac{1}{4} + \frac{\left[(20.35)^2 - (8.35)^2\right] \times 0.0175}{(1.05)^2 + (1.05)(27.65)}$ is:

$\frac{1}{4} + \frac{\left[(20.35)^2 - (8.35)^2\right] \times 0.0175}{(1.05)^2 + (1.05)(27.65)}$ का मान ज्ञात करें।

(A) $\frac{9}{20}$ (B) $\frac{7}{20}$

(C) $\frac{3}{20}$ (D) $\frac{3}{10}$

4. If $x = \sqrt{1+\frac{\sqrt{3}}{2}} - \sqrt{1-\frac{\sqrt{3}}{2}}$, then the value of $\frac{\sqrt{3}-x}{\sqrt{3}+x}$ (corrected to two decimal places) is:

यदि $x = \sqrt{1+\frac{\sqrt{3}}{2}} - \sqrt{1-\frac{\sqrt{3}}{2}}$ है, तो $\frac{\sqrt{3}-x}{\sqrt{3}+x}$ का मान ज्ञात करें। (दशमलव के दो स्थानों तक सही)

(A) 0.25 (B) 0.17
(C) 0.19 **(D)** 0.27

5. If $\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{3+\sqrt{5}}} = a + \sqrt{5}\,b$, with a, b > 0, then what is the value of (ab) : (a + b)?

यदि $\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{3+\sqrt{5}}} = a + \sqrt{5}\,b$ है, जहां a, b > 0, है, तो (ab) : (a + b) का मान क्या होगा?

(A) 7:8 (B) 7:4
(C) 4:7 (D) 8:7

6. The value of $\frac{(2.53)^3 + (2.47)^3}{25.3 \times 25.3 - 624.91 + 24.7 \times 24.7}$ is 5×10^k, where the value of k is:

$\frac{(2.53)^3 + (2.47)^3}{25.3 \times 25.3 - 624.91 + 24.7 \times 24.7}$ का मान 5×10^k है। k का मान कितना होगा?

(A) –2 (B) –1
(C) 1 (D) 2

7. The value of

$9 \div \left\{\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{6} \div \left(\frac{3}{4} - \frac{1}{3}\right) of \frac{2}{9}\right\}$ is:

का मान ज्ञात करें।

(A) $\frac{540}{173}$ (B) $\frac{340}{173}$

(C) $\frac{480}{173}$ (D) $\frac{2540}{173}$

8. The value of $\frac{3}{70} + \frac{1}{42} + \frac{1}{66} + \frac{3}{286} + \frac{1}{130} + \frac{1}{170}$ is:

$\frac{3}{70} + \frac{1}{42} + \frac{1}{66} + \frac{3}{286} + \frac{1}{130} + \frac{1}{170}$ का मान कितना होगा?

(A) $\frac{7}{85}$ (B) $\frac{11}{85}$ **(C)** $\frac{9}{85}$ (D) $\frac{3}{85}$

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9. The value of $15 \div 8 - \frac{5}{4}$ of $\left(\frac{8}{3}\times\frac{9}{16}\right)+\left(\frac{9}{8}\times\frac{3}{4}\right)-\left(\frac{5}{32}\div\frac{5}{7}\right)+\frac{3}{8}$ is:

$15 \div 8 - \frac{5}{4}$ of $\left(\frac{8}{3}\times\frac{9}{16}\right)+\left(\frac{9}{8}\times\frac{3}{4}\right)-\left(\frac{5}{32}\div\frac{5}{7}\right)+\frac{3}{8}$ का मान कितना होगा ?

(A) 0 **(B)** 1
(C) 2 (D) 3

10. If $\frac{\sqrt{26-7\sqrt{3}}}{\sqrt{14+5\sqrt{3}}}=\frac{b+a\sqrt{3}}{11}$, $b>0$, then what is the value of $\sqrt{(b-a)}$?

यदि $\frac{\sqrt{26-7\sqrt{3}}}{\sqrt{14+5\sqrt{3}}}=\frac{b+a\sqrt{3}}{11}$, $b>0$ हो, तो $\sqrt{(b-a)}$ का मान कितना होगा ?

(A) 5 (B) 25
(C) 12 (D) 9

11. If $\frac{\sqrt{38-5\sqrt{3}}}{\sqrt{26+7\sqrt{3}}}=\frac{a+b\sqrt{3}}{23}$, $b>0$, then the value of $(b-a)$ is:

यदि $\frac{\sqrt{38-5\sqrt{3}}}{\sqrt{26+7\sqrt{3}}}=\frac{a+b\sqrt{3}}{23}$, $b>0$ हो, तो $(b-a)$ का मान कितना होगा ?

(A) 7 (B) 18
(C) 29 (D) 11

Solution

1. (B) $\left(1\frac{1}{3}\div 2\frac{6}{7}\,of\,5\frac{3}{5}\right)\times\left(6\frac{2}{5}\div 4\frac{1}{2}\,of\,5\frac{1}{3}\right)\div\left(\frac{3}{4}\times 2\frac{2}{3}\div\frac{5}{9}\,of\,1\frac{1}{5}\right)=k$

$\left(\frac{4}{3}\div\frac{20}{7}\,of\,\frac{28}{5}\right)\times\left(\frac{32}{5}\div\frac{9}{2}\,of\,\frac{16}{3}\right)\div\left(\frac{3}{4}\times\frac{8}{3}\div\frac{5}{9}\,of\,\frac{6}{5}\right)$

$=\left(\frac{4}{3}\div 16\right)\times\left(\frac{32}{5}\div 24\right)\div\left(2\div\frac{2}{3}\right)$

$=\left(\frac{1}{12}\right)\times\left(\frac{4}{15}\right)\div(3)$

$=\frac{4}{12\times 15}\times\frac{1}{3}=\frac{1}{135}=0.0074$

2. (C) $\left(2\frac{6}{7}\,of\,4\frac{1}{5}\div\frac{2}{3}\right)\times 5\frac{1}{9}\div\left(\frac{3}{4}\times 2\frac{2}{3}\,of\,\frac{1}{2}\div\frac{1}{4}\right)$

$=\left(\frac{20}{7}\,of\,\frac{21}{5}\div\frac{2}{3}\right)\times\frac{46}{9}\div\left(\frac{3}{4}\times\frac{8}{3}\,of\,\frac{1}{2}\div\frac{1}{4}\right)$

$=\left(12\times\frac{3}{2}\right)\times\frac{46}{9}\div\left(\frac{3}{4}\times\frac{4}{3}\div\frac{1}{4}\right)$

$=18\times\frac{46}{9}\div 4=18\times\frac{46}{9}\times\frac{1}{4}=23$

3. (A) $\frac{1}{4}+\frac{\left[(20.35)^2-(8.35)^2\right]\times 0.0175}{(1.05)^2+(1.05)(27.65)}$

$\frac{1}{4}+\frac{12\times 28.7\times 175}{1.05(1.05+27.65)\times 10000}$

$\frac{1}{4}+\frac{12\times 28.7\times 175}{1.05\times 28.7\times 10000}=\frac{1}{4}+\frac{1}{5}=\frac{9}{20}$

4. (D) $x=\sqrt{1+\frac{\sqrt{3}}{2}}-\sqrt{1-\frac{\sqrt{3}}{2}}$

$x=\sqrt{\frac{2+\sqrt{3}}{2}}-\sqrt{\frac{2-\sqrt{3}}{2}}$

$x=\sqrt{\frac{4+2\sqrt{3}}{4}}-\sqrt{\frac{4-2\sqrt{3}}{2}}$

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

$x=1$

$\Rightarrow\frac{\sqrt{3}-x}{\sqrt{3}+x}=\frac{\sqrt{3}-1}{\sqrt{3}+1}=\frac{\left(\sqrt{3}-1\right)^2}{2}$

$=2-\sqrt{3}=2-1.732$

$=0.268$

5. (A) $\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{3}+\sqrt{5}}=a+\sqrt{5}b$

$=\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{\frac{2\left(3+\sqrt{5}\right)}{2}}}$

$=\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{\frac{6+2\sqrt{5}}{\sqrt{2}}}}$

$= \frac{44}{8-\sqrt{\left(\sqrt{5}+1\right)^2}} = \frac{44}{8-\left(\sqrt{5}-1\right)}$

$= \frac{44}{7-\sqrt{5}} = a+\sqrt{5}b \Rightarrow \frac{44\times\left(7+\sqrt{5}\right)}{7^2-5}$

$= \frac{44}{24}\left(7+\sqrt{5}\right) = a+\sqrt{5}\,b$

$\Rightarrow a = \frac{11}{6}\times 7, b = \frac{11}{6}$

ab : a + b = 7 : 8

6. (A) $\frac{(2.53)^3+(2.47)^3}{25.3\times 25.3-25.3\times 24.7+24.7\times 24.7}$

$= \frac{(2.53)^3+(2.47)^3}{100\times[2.53\times 2.53-2.53\times 2.47+2.47\times 2.47]}$

since $a^3+b^3 = (a+b)(a^2+b^2-ab)$

$= \frac{2.53+2.47}{100} = \frac{5}{100} = 5\times 10^{-2}$

k = –2

7. (A) $9\div\left[\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{6}\div\left(\frac{5}{12}\times\frac{2}{9}\right)\right]$

$= 9\div\left[\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{6}\times\frac{12\times 9}{10}\right]$

$= 9\div\left[\frac{5}{6}+\frac{1}{4}+\frac{9}{5}\right] = 9\div\left[\frac{50+15+108}{60}\right]$

$= 9\div\left[\frac{173}{60}\right] = 9\times\frac{60}{173} = \frac{540}{173}$

8. (C) $\frac{3}{70}+\frac{1}{42}+\frac{1}{66}+\frac{3}{286}+\frac{1}{130}+\frac{1}{170}$

$= \frac{9}{210}+\frac{5}{210}+\frac{1}{66}+\frac{3}{286}+\frac{1}{130}+\frac{1}{170}$

$= \frac{9}{110}+\frac{3}{286}+\frac{1}{130}+\frac{1}{170}$

$= \frac{132}{11\times 130}+\frac{1}{130}+\frac{1}{170} = \frac{132+11}{11\times 130}+\frac{1}{170}$

$= \frac{17}{170}+\frac{1}{170} = \frac{18}{170} = \frac{9}{85}$

9. (B) $\frac{15}{8}-\frac{5}{4}\left(\frac{8}{3}\times\frac{9}{16}\right)+\left(\frac{9}{8}\times\frac{3}{4}\right)-\left(\frac{5}{32}\times\frac{7}{5}\right)+\frac{3}{8}$

$= \frac{15}{8}-\frac{15}{8}+\frac{27}{32}-\frac{7}{32}+\frac{3}{8}$

$= \frac{20}{32}+\frac{3}{8} = \frac{5}{8}+\frac{3}{8} = 1$

10. (A) $\frac{\sqrt{26-7\sqrt{3}}}{\sqrt{14+5\sqrt{3}}} = \frac{b+a\sqrt{3}}{11}$

$\Rightarrow \frac{\sqrt{52-14\sqrt{3}}}{\sqrt{28+10\sqrt{3}}} = \frac{b+a\sqrt{3}}{11}$

$\Rightarrow \frac{\sqrt{49+3-2\times 7\times\sqrt{3}}}{\sqrt{25+3+2\times 5\times\sqrt{3}}} = \frac{b+a\sqrt{3}}{11}$

$\Rightarrow \frac{\sqrt{\left(7-\sqrt{3}\right)^2}}{\sqrt{\left(5+\sqrt{3}\right)^2}} = \frac{b+a\sqrt{3}}{11}$

$\Rightarrow \frac{7-\sqrt{3}}{5+\sqrt{3}} = \frac{b+a\sqrt{3}}{11}$

$\Rightarrow \frac{\left(7-\sqrt{3}\right)\left(5-\sqrt{3}\right)}{22} = \frac{b+a\sqrt{3}}{11}$

$\Rightarrow b+a\sqrt{3} = \frac{35+3-12\sqrt{3}}{2} = 19-6\sqrt{3}$

$\Rightarrow$ b = 19, a = – 6

$\sqrt{b-a} = \sqrt{19-(-6)} = 5$

11. (C) $\frac{\sqrt{38-5\sqrt{3}}}{\sqrt{26+7\sqrt{3}}} = \frac{a+b\sqrt{3}}{23}$

$\Rightarrow \frac{\sqrt{76-2\times 1\times\sqrt{75}}}{\sqrt{52+2\times 7\times\sqrt{3}}} = \frac{a+b\sqrt{3}}{23}$

$\Rightarrow \frac{\sqrt{(\sqrt{75}-1)^2}}{\sqrt{(7+\sqrt{3})^2}} = \frac{a+b\sqrt{3}}{23}$

$\Rightarrow \frac{5\sqrt{3}-1}{7+\sqrt{3}} = \frac{a+b\sqrt{3}}{23}$

$\Rightarrow \frac{(5\sqrt{3}-1)(7-\sqrt{3})}{46} = \frac{a+b\sqrt{3}}{23}$

$\Rightarrow \frac{35\sqrt{3}-7-15+\sqrt{3}}{46} = \frac{a+b\sqrt{3}}{23}$

$\Rightarrow \frac{36\sqrt{3}-22}{2} = a+b\sqrt{3}$

$\Rightarrow a+b\sqrt{3} = -11+18\sqrt{3}$

on comparing,

a = – 11, b = 18

b – a = 18 – (– 11) = 29

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Simplification (MAINS — 2019)

1. If $\frac{1}{4-\sqrt{8}}+\frac{3+2\sqrt{2}}{3-2\sqrt{2}}-\frac{3-2\sqrt{2}}{3+2\sqrt{2}}=a+b\sqrt{2}$, then what is the value of (3a + 4b) ?

यदि $\frac{1}{4-\sqrt{8}}+\frac{3+2\sqrt{2}}{3-2\sqrt{2}}-\frac{3-2\sqrt{2}}{3+2\sqrt{2}}=a+b\sqrt{2}$ है, तो $(3a+4b)$ का मान ज्ञात कीजिए।

(A) $98\frac{1}{2}$ (B) 97

(C) $99\frac{1}{2}$ (D) 98

2. The value of 3 ÷ 18 of 3 × 6 + 21 × 6 ÷ 18 – 3 ÷ 2 + 3 – 3 ÷ 9 of 3 × 9 is:

3 ÷ 18 of 3 × 6 + 21 × 6 ÷ 18 – 3 ÷ 2 + 3 – 3 ÷ 9 of 3 × 9 का मान ज्ञात कीजिए।

(A) $\frac{29}{6}$ (B) $\frac{47}{6}$

(C) $\frac{35}{9}$ (D) $\frac{41}{9}$

3. Let $x=\left(\frac{\sqrt{1875}}{\sqrt{3888}}\div\frac{\sqrt{1200}}{\sqrt{768}}\right)\times\frac{\sqrt{175}}{\sqrt{1792}}$. Then $\sqrt{x}$ is equal to:

माना $x=\left(\frac{\sqrt{1875}}{\sqrt{3888}}\div\frac{\sqrt{1200}}{\sqrt{768}}\right)\times\frac{\sqrt{175}}{\sqrt{1792}}$ है। तो $\sqrt{x}$, ... के बराबर है।

(A) $\frac{5}{12}$ (B) $\frac{4}{9}$

(C) $\frac{7}{12}$ (D) $\frac{5}{9}$

4. The Value of $\left[\frac{4}{7}\text{of}2\frac{4}{5}\times1\frac{2}{3}-\left(3\frac{1}{2}-2\frac{1}{6}\right)\right]\div\left(3\frac{1}{5}\div4\frac{1}{2}\text{of}5\frac{1}{3}\right)$ is :

$\left[\frac{4}{7}\text{of}2\frac{4}{5}\times1\frac{2}{3}-\left(3\frac{1}{2}-2\frac{1}{6}\right)\right]\div\left(3\frac{1}{5}\div4\frac{1}{2}\text{of}5\frac{1}{3}\right)$ का मान ज्ञात कीजिए।

(A) 10 (B) 15

(C) $1\frac{1}{3}$ (D) $7\frac{1}{2}$

5. If $\frac{45}{53}=\frac{1}{a+\frac{1}{b+\frac{1}{c-\frac{2}{5}}}}$ Where a, b and c are positive intergers, then what is the value of (4a – b + 3c) ?

यदि $\frac{45}{53}=\frac{1}{a+\frac{1}{b+\frac{1}{c-\frac{2}{5}}}}$ है, जहाँ a, b और c धनात्मक पूर्णांक हैं, तो (4a – b + 3c) का मान ज्ञात कीजिए।

(A) 6 (B) 4

(C) 5 (D) 7

6. The Value of $\frac{0.0203\times2.92}{0.7\times0.0365\times2.9}\div\frac{(12.12)^2-(8.12)^2}{(0.25)^2+(0.25)(19.99)}$ is:

$\frac{0.0203\times2.92}{0.7\times0.0365\times2.9}\div\frac{(12.12)^2-(8.12)^2}{(0.25)^2+(0.25)(19.99)}$ का मान ज्ञात कीजिए।

(A) 0.05 (B) 0.1

(C) 0.5 (D) 0.01

7. The expression $\frac{15\left(\sqrt{10}+\sqrt{5}\right)}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$ is equal to :

व्यंजक $\frac{15\left(\sqrt{10}+\sqrt{5}\right)}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$ ..... के बराबर है।

(A) $5+2\sqrt{2}$ (B) $5-2\sqrt{5}$

(C) $5\left(3+2\sqrt{2}\right)$ (D) $10\left(3+2\sqrt{5}\right)$

8. If $\sqrt{11-3\sqrt{8}}=a+b\sqrt{2}$, then what is the value of (2a + 3b) ?

यदि $\sqrt{11-3\sqrt{8}} = a+b\sqrt{2}$ है, तो (2a + 3b) का मान ज्ञात कीजिए।

(A) 5 (B) 7
(C) 9 (D) 3

9. If $\cfrac{1}{x+\cfrac{1}{y+\cfrac{2}{z+\cfrac{1}{4}}}} = \cfrac{29}{79}$, where x, y and z are natural numbers, then the value of (2x + 3y – z) is :

यदि $\cfrac{1}{x+\cfrac{1}{y+\cfrac{2}{z+\cfrac{1}{4}}}} = \cfrac{29}{79}$ है, जहाँ x, y और z प्राकृतिक संख्याएं हैं, तो (2x + 3y – z) का मान ज्ञात कीजिए।

(A) 1 (B) 4
(C) 0 (D) 2

10. The value of $3\frac{1}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3} + \frac{1}{8} \div \frac{1}{2} \text{ of } \frac{1}{4} - \frac{1}{4}\left(\frac{1}{2} \div \frac{1}{8} \times \frac{1}{4}\right)$ is :

$3\frac{1}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3} + \frac{1}{8} \div \frac{1}{2} \text{ of } \frac{1}{4} - \frac{1}{4}\left(\frac{1}{2} \div \frac{1}{8} \times \frac{1}{4}\right)$ का मान ज्ञात कीजिए।

(A) $\frac{53}{60}$ (B) $\frac{13}{15}$
(C) $\frac{7}{8}$ (D) $\frac{3}{4}$

11. The value of 4 ÷ 12 of [3 ÷ 4 of {(4 – 2) × 6 ÷ 2}] – 2 × 6 ÷ 8 + 3 is :
4 ÷ 12 of [3 ÷ 4 of {(4 – 2) × 6 ÷ 2}] – 2 × 6 ÷ 8 + 3 का मान ज्ञात कीजिए।

(A) $4\frac{1}{6}$ (B) $7\frac{1}{6}$
(C) $2\frac{1}{3}$ (D) $3\frac{1}{3}$

12. The value of $\cfrac{27\times(0.25)^3+125(0.05)^2}{(0.75)^2-0.25\times0.5}$ is :

$\cfrac{27\times(0.25)^3+125(0.05)^2}{(0.75)^2-0.25\times0.5}$ का मान ज्ञात कीजिए।

(A) 1 (B) 0.25
(C) 0.75 (D) 0.5

13. The value of $\cfrac{7+3\sqrt{5}}{3+\sqrt{5}} - \cfrac{7-3\sqrt{5}}{3-\sqrt{5}}$ lies between :

$\cfrac{7+3\sqrt{5}}{3+\sqrt{5}} - \cfrac{7-3\sqrt{5}}{3-\sqrt{5}}$ का मान ..... के बीच होगा।

(A) 2 and/और 2.5 (B) 3 and/और 3.5
(C) 1.5 and/और 2 (D) 2.5 and/और 3

14. If $\frac{b}{a} = 0.7$, find the value of $\frac{a-b}{a+b} + \frac{11}{34}$.

यदि $\frac{b}{a} = 0.7$ है, तो $\frac{a-b}{a+b} + \frac{11}{34}$ का मान कितना कीजिए।

(A) 1 (B) 0.2
(C) 0.5 (D) 0.3

15. If $\frac{8+2\sqrt{3}}{3\sqrt{3}+5} = a\sqrt{3} - b$, then the value of a + b is equal to :

यदि $\frac{8+2\sqrt{3}}{3\sqrt{3}+5} = a\sqrt{3} - b$ है, तो a + b का मान ज्ञात कीजिए।

(A) 18 (B) 15
(C) 16 (D) 24

16. If $2 = x + \cfrac{1}{1+\cfrac{1}{5+\frac{1}{2}}}$, then the value of x is equal to :

यदि $2 = x + \cfrac{1}{1+\cfrac{1}{5+\frac{1}{2}}}$ है, तो x का मान ज्ञात कीजिए।

(A) $\frac{14}{13}$ (B) 1
(C) $\frac{15}{13}$ (D) $\frac{13}{15}$

17. Evaluate : $\frac{1}{15} + \frac{1}{35} + \frac{1}{63} + \frac{1}{99} + \frac{1}{143}$.

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$\frac{1}{15}+\frac{1}{35}+\frac{1}{63}+\frac{1}{99}+\frac{1}{143}$ का मान ज्ञात कीजिए।

(A) $\frac{4}{39}$ (B) $\frac{7}{39}$

(C) $\frac{5}{39}$ (D) $\frac{10}{39}$

18. If $\frac{1}{4.263}=0.2346$, find the value of $\frac{1}{0.0004263}$.

यदि $\frac{1}{4.263}=0.2346$ है, तो $\frac{1}{0.0004263}$ का मान ज्ञात कीजिए।

(A) 4.263 (B) 2.346
(C) 2346 (D) 4263

19. If $x=\sqrt{-\sqrt{3}+\sqrt{3+8\sqrt{7+4\sqrt{3}}}}$ where $x>0$, then the value of x is equal to :

यदि $x=\sqrt{-\sqrt{3}+\sqrt{3+8\sqrt{7+4\sqrt{3}}}}$ जहाँ $x>0$ है, तो x का मान ज्ञात कीजिए।

(A) 2 (B) 3
(C) 4 (D) 1

20. The value of $5-\frac{8+2\sqrt{15}}{4}-\frac{1}{8+2\sqrt{15}}$ is equal to :

$5-\frac{8+2\sqrt{15}}{4}-\frac{1}{8+2\sqrt{15}}$ का मान ज्ञात कीजिए।

(A) $\frac{2}{3}$ (B) 1

(C) $\frac{1}{2}$ (D) $\frac{1}{4}$

21. Evaluate the following :
5 – [96 ÷ 4 of 3 – (16 – 55 ÷ 5)]
5 – [96 ÷ 4 of 3 – (16 – 55 ÷ 5)] का मान ज्ञात कीजिए।

(A) 0 (B) 3
(C) 2 (D) 4

Solution

1. (C) $\frac{1}{4-\sqrt{8}}+\frac{3+2\sqrt{2}}{3-2\sqrt{2}}-\frac{3-2\sqrt{2}}{3+2\sqrt{2}}=a+b\sqrt{2}$

$$\frac{4+\sqrt{8}}{16-8}+\frac{\left(3+2\sqrt{2}\right)^2}{3^2-\left(2\sqrt{2}\right)^2}-\frac{\left(3+2\sqrt{2}\right)^2}{3^2-\left(2\sqrt{2}\right)^2}$$

$$\frac{4+\sqrt{8}}{8}+\frac{9+8+12\sqrt{2}}{1}-\frac{\left(9+8-12\sqrt{2}\right)}{1}$$

$$\frac{4+\sqrt{8}}{8}+17+12\sqrt{2}-17+12\sqrt{2}$$

$$=\frac{1}{2}+\frac{1}{\sqrt{8}}+24\sqrt{2}$$

$$=\frac{1}{2}+\frac{1}{2\sqrt{2}}+24\sqrt{2}$$

$$=\frac{1}{2}+\frac{1+96}{2\sqrt{2}}$$

$$=\frac{1}{2}+\frac{97}{2\sqrt{2}}\frac{\sqrt{2}}{\sqrt{2}}$$

$$\frac{1}{2}+\frac{97\sqrt{2}}{4}$$

$a=\frac{1}{2}$ $b=\frac{97}{4}$

3a + 4b

$$\frac{3}{2}+4\times\frac{97}{4}=98\frac{1}{2}$$

2. (D) $3\div54\times6+21\times\frac{6}{18}-\frac{3}{2}+3-3\div27\times9$

$$\frac{3\times6}{54}+21\times\frac{6}{18}-\frac{3}{2}+3-\frac{3}{27}\times9$$

$$\frac{1}{3}+7-\frac{3}{2}+3-1$$

$$=\frac{1}{3}+9-\frac{3}{2}$$

$$=\frac{2+54-9}{6}=\frac{47}{6}$$

3. (C) $\frac{25\sqrt{3}}{4\sqrt{243}}\times\frac{16\sqrt{3}}{20\sqrt{3}}\times\frac{5\sqrt{7}}{16\sqrt{7}}$

$$= \frac{25}{16} \times \sqrt{\frac{3}{243}}$$

$$x = \frac{25}{16} \times \frac{1}{9}$$

$$\sqrt{x} = \frac{5}{4 \times 3}$$

$$= \frac{5}{12}$$

4.(A) $\left[\frac{4}{7}\text{of}\,2\frac{4}{5} \times 1\frac{2}{3} - \left(3\frac{1}{2} - 2\frac{1}{6}\right)\right] \div \left(3\frac{1}{5} \div 4\frac{1}{2}\text{of}\,5\frac{1}{3}\right)$

$$\left[\frac{4}{7} \times \frac{14}{5} \times \frac{5}{3} - \left(\frac{7}{2} - \frac{13}{6}\right)\right] \div \left(\frac{16}{5} \div \frac{9}{2} \times \frac{16}{3}\right)$$

$$\left[\frac{8}{3} - \left(\frac{8}{6}\right)\right] \div \left(\frac{16}{5} \div 24\right)$$

$$\left[\frac{8}{3} - \frac{4}{3}\right] \div \left(\frac{16}{5 \times 24}\right)$$

$$\frac{4}{3} \div \frac{2}{15}$$

$$\frac{4}{3 \times 2} \times 15 = 10$$

5. (C) $\begin{vmatrix} 1 & 5 & 2 \\ a & b & c \end{vmatrix}$

$4(1) - 5 + 3(2)$
$4 - 5 + 6$
$= 5$

6. (A) $\frac{0.059276}{0.074095} \times \frac{0.0625 + 4.9975}{4 \times 20.24}$

$$0.8 \times \frac{5.06}{4 \times 20.24}$$

$= 0.05$

7. (C) $\frac{15\left(\sqrt{10} + \sqrt{5}\right)}{\sqrt{10} + 2\sqrt{5} + 2\sqrt{10} - \sqrt{5} - 4\sqrt{5}}$

$$= \frac{15\left(\sqrt{10} + \sqrt{5}\right)}{\left(\sqrt{10} - \sqrt{5}\right)}$$

$$= \frac{5\left(\sqrt{10} + \sqrt{5}\right)}{\sqrt{10} - \sqrt{5}} \times \frac{\sqrt{10} + \sqrt{5}}{\sqrt{10} + \sqrt{5}}$$

$$= \frac{5\left(\sqrt{10} + \sqrt{5}\right)^2}{10 - 5}$$

$$= 10 + 5 + 2\sqrt{10 \times 5}$$

$$= 15 + 10\sqrt{2}$$

$$= 5\left(3 + 2\sqrt{2}\right)$$

8. (D) $\left(3 - \sqrt{2}\right)^2 = 3 - \sqrt{2}$

$a + b\sqrt{2}$
$a = 3, b = -1$
$2a + 3b$
$2 \times 3 + 3 \times (-1)$
$6 - 3 = 3$

9. (D) $x = 2, y = 1, z = 5$

$$\frac{29}{79} = \frac{7}{\frac{79}{29}} = \frac{1}{2 + \frac{21}{29}} = \frac{1}{2 + \frac{1}{\frac{29}{21}}}$$

$$= \frac{1}{2 + \frac{1}{1 + \frac{8}{21}}} = \frac{1}{2 + \frac{1}{1 + \frac{2}{\frac{21}{4}}}}$$

$$= \frac{21}{4} = 5 + \frac{1}{4}$$

$x = 2, y = 1, z = 5$
$= 2 \times 2 + 3 \times 1 - 5 = 2$

10. (A) $\frac{16}{5} \div \frac{9}{2} \times \frac{16}{3} + \frac{1}{8} \div \left(\frac{1}{8}\right) - \frac{1}{4}\left(\frac{1}{2} \times 8 \times \frac{1}{4}\right)$

$$\frac{16}{5} \times \frac{1}{24} - \frac{1}{4} + 1$$

$$1 + \frac{2}{15} - \frac{1}{4} = \frac{60 + 8 - 15}{60} = \frac{53}{60}$$

11. (A) $4 \div 12\text{of}\,[3 \div 4\,\text{of}\,\{6\}] - 2 \times 6 \div 8 + 3$

$$4 \div \frac{12}{8} - 2 \times \frac{6}{8} + 3$$

$$\frac{8}{3} - \frac{3}{2} + 3 = \frac{25}{6} = 4\frac{1}{6}$$

12. (A) $\frac{(0.75)^3 + (.25)^3}{(0.75)^2 - 0.25 \times 0.5}$

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$$\frac{(0.75+0.25)((0.75)^2+(0.25)^2-0.75\times0.25)}{(0.75)^2-0.25\times0.5}$$

$0.75 + 0.25 = 1$

13. (A) $\frac{(7+3\sqrt{5})(3-\sqrt{5})-(7-3\sqrt{5})(3+\sqrt{5})}{9-5}$

$\frac{1}{4}\left[21-7\sqrt{5}+9\sqrt{5}-15-(21+7\sqrt{5}-9\sqrt{5}-15)\right]$

$\frac{1}{4}(21-7\sqrt{5}+9\sqrt{5}-15-21-7\sqrt{5}+9\sqrt{5}+15)$

$\frac{1}{4}(-14\sqrt{5}+18\sqrt{5})$

$\frac{4\sqrt{5}}{4}=\sqrt{5}$

14. (C) $\frac{b}{a}=\frac{7}{10}$

$\frac{a}{b}=\frac{10}{7}$

$\frac{a+b}{a-b}=\frac{17}{3}$

$\frac{a-b}{a+b}=\frac{3}{17}$

$\frac{3}{17}+\frac{11}{34}=\frac{17}{34}=\frac{1}{2}$

$= 0.5$

15. (A) $\frac{8+2\sqrt{3}}{3\sqrt{3}+5}\times\frac{3\sqrt{3}-5}{3\sqrt{3}-5}$

$= \frac{24\sqrt{3}+18-40-10\sqrt{3}}{2}$

$= \frac{14\sqrt{3}-22}{2}=7\sqrt{3}-11$

$a = 7$
$b = 11$
$a + b = 18$

16. (C) $2 = x+\frac{1}{1+\frac{2}{11}}$

$2 = x + \frac{1}{\frac{13}{11}}$

$2 = x + \frac{11}{13}$

$x = \frac{26-11}{13}=\frac{15}{13}$

17. (C) $= \frac{1}{15}+\frac{1}{35}+\frac{1}{63}+\frac{1}{99}+\frac{1}{143}$

$= \frac{10}{105}+\frac{1}{63}+\frac{1}{99}+\frac{1}{143}$

$= \frac{2}{27}+\frac{1}{63}+\frac{1}{99}+\frac{1}{143}$

$= \frac{7}{63}+\frac{1}{99}+\frac{1}{143}$

$= \frac{1}{9}+\frac{1}{99}+\frac{1}{143}$

$= \frac{12}{99}+\frac{1}{143}$

$= \frac{156+9}{1287}=\frac{165}{1287}=\frac{5}{39}$

18. (C) $\frac{1}{0.0004263}=\frac{10000}{4.263}$ = 10000 × 0.2346

19. (A) $= \sqrt{-\sqrt{3}+\sqrt{3+8\sqrt{7+4\sqrt{3}}}}$

$= \sqrt{-\sqrt{3}+\sqrt{3+16+8\sqrt{3}}}$

$= \sqrt{-\sqrt{3}+\sqrt{\left(\sqrt{16}+\sqrt{3}\right)^2}}$

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

$= \sqrt{4} = 2$

20. (B) $5-\frac{8+2\sqrt{15}}{4}-\frac{1}{8+2\sqrt{15}}$

$= \frac{20\left(8+2\sqrt{15}\right)-\left(8+2\sqrt{15}\right)^2-4}{4\left(8+2\sqrt{15}\right)}$

$= \frac{160+40\sqrt{15}-60-60-32\sqrt{15}-4}{4\left(8+2\sqrt{15}\right)}$

$= \frac{4\left(8+2\sqrt{15}\right)}{4\left(8+2\sqrt{15}\right)} = 1$

21. (C) $5 - [96 \div 4 \text{ of } 3 - 5]$
$5 - [96 \div 12 - 5]$
$5 - 3 = 2$

Simplification (MAINS — 2018)

1. The value of $\frac{7+8\times8\div8 \text{ of } 8+8\div8\times4 \text{ of } 4}{4\div4 \text{ of } 4+4\times4\div4-4\div4 \text{ of } 2}$ is –

$\frac{7+8\times8\div8 \text{ of } 8+8\div8\times4 \text{ of } 4}{4\div4 \text{ of } 4+4\times4\div4-4\div4 \text{ of } 2}$ का मान है :

(A) 7.8 (B) 4.6
(C) 8.7 (D) 6.4

2. The value of $22.\overline{4}+11.5\overline{67}-33.5\overline{9}$ is :

$22.\overline{4}+11.5\overline{67}-33.5\overline{9}$ का मान है :

(A) $0.\overline{32}$ (B) $0.\overline{412}$
(C) $0.3\overline{1}$ (D) $0.4\overline{12}$

3. The value of $\frac{(253)^3+(247)^3}{25.3\times25.3-624.91+24.7\times24.7}$ is 50×10^k, where the value of k is :

$\frac{(253)^3+(247)^3}{25.3\times25.3-624.91+24.7\times24.7}$ का मान 50×10^k है, जहां k का मान है :

(A) 3 (B) 4
(C) 2 (D) –3

4. If $\left(\sqrt{2}+\sqrt{5}-\sqrt{3}\right)\times k=-12$, then what will be the value of k ?

यदि $\left(\sqrt{2}+\sqrt{5}-\sqrt{3}\right)\times k=-12$, तो k का मान क्या होगा ?

(A) $\sqrt{2}+\sqrt{5}+\sqrt{3}$

(B) $\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)\left(2-\sqrt{10}\right)$

(C) $\left(\sqrt{2}+\sqrt{5}-\sqrt{3}\right)\left(2+\sqrt{5}\right)$

(D) $\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)\left(2-\sqrt{5}\right)$

5. The value of $\left(2\frac{6}{7}\text{of}4\frac{1}{5}\div\frac{2}{3}\right)\times1\frac{1}{9}\div\left(\frac{3}{4}\times2\frac{2}{3}\text{ of }\frac{1}{2}\div\frac{1}{4}\right)$ is :

$\left(2\frac{6}{7}\text{of}4\frac{1}{5}\div\frac{2}{3}\right)\times1\frac{1}{9}\div\left(\frac{3}{4}\times2\frac{2}{3}\text{ of }\frac{1}{2}\div\frac{1}{4}\right)$ का मान है :

(A) 5 (B) 8
(C) $\frac{1}{8}$ (D) $\frac{1}{5}$

6. The value of $\left(1\frac{1}{3}\div2\frac{6}{7}\text{ of }5\frac{3}{5}\right)\div\left(6\frac{2}{5}\div4\frac{1}{2}\text{ of }5\frac{1}{3}\right)\times\left(\frac{3}{4}\times2\frac{2}{3}\div\frac{5}{9}\text{of}1\frac{1}{5}\right)=1+k$, where k lies between :

$\left(1\frac{1}{3}\div2\frac{6}{7}\text{ of }5\frac{3}{5}\right)\div\left(6\frac{2}{5}\div4\frac{1}{2}\text{ of }5\frac{1}{3}\right)\times\left(\frac{3}{4}\times2\frac{2}{3}\div\frac{5}{9}\text{of}1\frac{1}{5}\right)=1+k$ है, तो k का मान किसके बीच आएगा ?

(A) –0.07 and/और –0.06
(B) –0.08 and/और –0.07
(C) –0.06 and/और –0.05
(D) –0.05 and/और –0.04

7. The expression $\sqrt{10+2\left(\sqrt{6}-\sqrt{15}-\sqrt{10}\right)}$ is equal to :

व्यंजक $\sqrt{10+2\left(\sqrt{6}-\sqrt{15}-\sqrt{10}\right)}$ निम्नलिखित में से किसके बराबर है ?

(A) $\sqrt{3}+\sqrt{2}-\sqrt{5}$ (B) $\sqrt{3}-\sqrt{2}-\sqrt{5}$
(C) $\sqrt{3}-\sqrt{2}+\sqrt{5}$ (D) $\sqrt{2}-\sqrt{3}-\sqrt{5}$

8. The value of $\frac{(0.545)(0.081)(0.51)(5.2)}{(0.324)^3+(0.221)^3-(0.545)^3}$ is :

$\frac{(0.545)(0.081)(0.51)(5.2)}{(0.324)^3+(0.221)^3-(0.545)^3}$ का मान है :

(A) –1 (B) 1
(C) 3 (D) –3

9. The value of $0.5\overline{6}-0.7\overline{23}+0.3\overline{9}\times0.\overline{7}$ is :

$0.5\overline{6}-0.7\overline{23}+0.3\overline{9}\times0.\overline{7}$ का मान है :

(A) $0.1\overline{54}$ (B) $0.\overline{154}$
(C) $0.1\overline{58}$ (D) $0.15\overline{8}$

10. The value of 9 × 6 ÷ 24 + 8 ÷ 2 of 5 – 30 ÷ 4 of 4 + 27 × 5 ÷ 9 is :

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$9 \times 6 \div 24 + 8 \div 2$ of $5 - 30 \div 4$ of $4 + 27 \times 5 \div 9$ का मान है :

(A) $\frac{647}{40}$ (B) $\frac{243}{8}$

(C) $\frac{493}{8}$ (D) $\frac{259}{8}$

11. If $\sqrt{10-2\sqrt{21}}+\sqrt{8+2\sqrt{15}}=\sqrt{a}+\sqrt{b}$, where a and b are positive integers, then the value of $\sqrt{ab}$ is closest to :

यदि $\sqrt{10-2\sqrt{21}}+\sqrt{8+2\sqrt{15}}=\sqrt{a}+\sqrt{b}$ में a और b धनात्मक पूर्णांक है, तो $\sqrt{ab}$ का निकटतम मान है :

(A) 4.6 (B) 5.9
(C) 6.8 (D) 7.2

12. The value of $\sqrt{28+10\sqrt{3}}-\sqrt{7-4\sqrt{3}}$ is closest to :

$\sqrt{28+10\sqrt{3}}-\sqrt{7-4\sqrt{3}}$ का मान निम्नलिखित में से किसके सबसे अधिक निकट है ?

(A) 7.2 (B) 6.1
(C) 6.5 (D) 5.8

13. The value of $0.4\overline{7}+0.5\overline{03}-0.3\overline{9}\times 0.\overline{8}$ is :

$0.4\overline{7}+0.5\overline{03}-0.3\overline{9}\times 0.\overline{8}$ का मान क्या है ?

(A) $0.6\overline{15}$ (B) $0.\overline{615}$
(C) $0.61\overline{5}$ (D) $0.6\overline{25}$

14. The value of $\frac{2\sqrt{10}}{\sqrt{5}+\sqrt{2}-\sqrt{7}}-\sqrt{\frac{\sqrt{5}-2}{\sqrt{5}+2}}-\frac{3}{\sqrt{7}-2}$ is :

$\frac{2\sqrt{10}}{\sqrt{5}+\sqrt{2}-\sqrt{7}}-\sqrt{\frac{\sqrt{5}-2}{\sqrt{5}+2}}-\frac{3}{\sqrt{7}-2}$ का मान क्या है ?

(A) $2+\sqrt{2}$ (B) $2\sqrt{5}$
(C) $\sqrt{2}$ (D) $\sqrt{7}$

15. The value of $24 \times 2 \div 12 + 12 \div 6$ of $2 \div (15 \div 8 \times 4)$ of $(28 \div 7$ of $5)$ is :

$24 \times 2 \div 12 + 12 \div 6$ of $2 \div (15 \div 8 \times 4)$ of $(28 \div 7$ of $5)$ का मान क्या है ?

(A) $4\frac{1}{6}$ (B) $4\frac{8}{75}$

(C) $4\frac{2}{3}$ (D) $4\frac{32}{75}$

16. A student was asked to find the value of $9\frac{4}{9}\div 11\frac{1}{3}\text{of}\frac{1}{6}+\left(1\frac{1}{3}\times 1\frac{4}{5}\div\frac{3}{5}\right)\times 2\frac{1}{6}\text{of}\frac{2}{3}\div\frac{4}{2}\text{of}\frac{2}{3}$. His answer was $19\frac{1}{4}$. What is the difference between his answer and the correct answer ?

एक विद्यार्थी को $9\frac{4}{9}\div 11\frac{1}{3}\text{of}\frac{1}{6}+\left(1\frac{1}{3}\times 1\frac{4}{5}\div\frac{3}{5}\right)\times 2\frac{1}{6}\text{of}\frac{2}{3}\div\frac{4}{2}\text{of}\frac{2}{3}$ का मान निकालने के लिए कहा गया। उसका उत्तर $19\frac{1}{4}$ आया। उसके उत्तर और सही उत्तर में कितना अंतर है ?

(A) $7\frac{3}{4}$ (B) $6\frac{2}{3}$

(C) $7\frac{1}{2}$ (D) $6\frac{1}{3}$

17. The value of $\frac{(4.6)^4+(5.4)^4+(24.84)^2}{(4.6)^2+(5.4)^2+24.84}$ is :

$\frac{(4.6)^4+(5.4)^4+(24.84)^2}{(4.6)^2+(5.4)^2+24.84}$ का मान क्या है ?

(A) 24.42 (B) 24.24
(C) 25.42 (D) 25.48

Solution

1. (D) $\dfrac{7+8\times8\div8\text{ of }8+8\div8\times4\text{ of }4}{4\div4\text{ of }4+4\times4\div4-4\div4\text{ of }2}$

$$\frac{7+1+16}{\frac{4}{16}+4\times1-\frac{4}{8}} = \frac{24}{15}\times4 = 6.4$$

2. (D) $22.\overline{4} + 11.5\overline{67} - 33.5\overline{9}$

$$= (22+11-33)+\left(\frac{4}{9}+\frac{562}{990}-\frac{54}{90}\right)$$

$$= \frac{440+562-594}{990} = \frac{408}{990} = .4\overline{12}$$

3. (A) $\dfrac{(253)^3+(247)^3}{25.3\times25.3-624.91+24.7\times24.7\times24.7}$

$= 50 \times 10^{K}$

$$\Rightarrow \frac{500\left((253)^2+(247)^2-253\times247\right)}{10^{-2}\left((253)^2+(247)^2-253\times247\right)}$$

$= 50 \times 10^{K}$

$\Rightarrow 50 \times 10^{3} = 50 \times 10^{K}$

$\Rightarrow K = 3$

4. (B) $\left(\sqrt{2}+\sqrt{5}-\sqrt{3}\right)\times K = -12$

$$\Rightarrow K = \frac{-12}{\left(\sqrt{2}+\sqrt{5}-\sqrt{3}\right)}\times\frac{\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)}{\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)}$$

$$\Rightarrow K = \frac{-12\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)}{\left[\left(7+2\sqrt{10}\right)-3\right]}$$

$$\Rightarrow K = \frac{-12\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)}{\left(4+2\sqrt{10}\right)}\times\frac{\left(2-\sqrt{10}\right)}{\left(2-\sqrt{10}\right)}$$

$$\Rightarrow K = \frac{-12\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)\left(2-\sqrt{10}\right)}{-12}$$

$$\Rightarrow K = \left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)\left(2-\sqrt{10}\right)$$

5. (A) $\left(2\frac{6}{7}\text{ of }4\frac{1}{5}\div\frac{2}{3}\right)\times1\frac{1}{9}\div\left(\frac{3}{4}\times2\frac{2}{3}\text{ of }\frac{1}{2}\div\frac{1}{4}\right)$

$$= \left[\left(\frac{20}{7}\times\frac{21}{5}\right)\div\frac{2}{3}\right]\times\frac{10}{9}\div\left(\frac{3}{4}\times\left(\frac{8}{3}\times\frac{1}{2}\right)\div\frac{1}{4}\right)$$

$$= \left(12\times\frac{3}{2}\times\frac{10}{9}\right)\div4$$

$= 5$

6. (A) $\left(\frac{4}{3}\div\frac{20}{7}\times\frac{28}{5}\right) \div \left(\frac{32}{5}\div\frac{9}{2}\times\frac{16}{3}\right) \times \left(\frac{3}{4}\times\frac{8}{3}\div\frac{5}{9}\times\frac{6}{5}\right)$

$$\left(\frac{4}{3}\times\frac{1}{16}\right)\div\left(\frac{32}{5}\times\frac{1}{24}\right)\times\left(\frac{3}{4}\times\frac{8}{3}\times\frac{3}{2}\right)$$

$$\left(\frac{1}{12}\div\frac{4}{15}\right)\times(3)$$

$$\Rightarrow \frac{1}{12}\times\frac{15}{4}\times3 = 1 + k$$

$$\frac{15}{16} = 1 + k$$

$$k = \left(1-\frac{15}{16}\right)$$

$$k = -\frac{1}{16} = -0.0625$$

7. (A) $\sqrt{10+2\left(\sqrt{6}-\sqrt{5}-\sqrt{10}\right)}$

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

here, we can write $\sqrt{10+2\left(\sqrt{6}-\sqrt{5}-\sqrt{10}\right)}$ in form of $(a + b + c)^2$ as,

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

$$= \sqrt{3+2+5+2\sqrt{6}-2\sqrt{15}-2\sqrt{10}}$$

$$= \sqrt{10+2\left(\sqrt{6}-\sqrt{5}-\sqrt{10}\right)}$$

Which is same as above expression

8. (A) $a^3 + b^3 + c^3 = 3abc$ if $a + b + c = 0$

Here,

$a = 0.324$

$b = 0.221$

$c = -0.545$

$$\Rightarrow \frac{0.545\times0.081\times0.51\times5.2}{-3\times0.324\times0.221\times0.545}$$

$\Rightarrow -1$

9. (A) $\frac{51}{90}-\frac{716}{990}+\frac{36}{90}\times\frac{7}{9}$

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$$\frac{561}{990}-\frac{716}{990}+\frac{28\times11}{990}$$

$$\frac{153}{990} = 0.1\overline{54}$$

10.(A) $9 \times 6 \div 24 + 8 \div 2$ of $5 - 30 \div 4$ of $4 + 27 \times 5 \div 9$

$9 \div 6 \div 24 + 8 \div 10 - 30 \div 16 + 27 \times 5 \div 9$

$$\frac{9\times6}{24}+\frac{8}{10}-\frac{30}{16}+\frac{27\times5}{9}$$

$$\frac{9}{4}+\frac{4}{5}-\frac{15}{8}+15$$

$$\frac{90+32-75+600}{40}=\frac{647}{40}$$

11.(B) $\sqrt{\left(\sqrt{3}\right)^2+\left(\sqrt{5}\right)^2-2\sqrt{3}\sqrt{7}}$

$$+\sqrt{\left(\sqrt{5}\right)^2+\left(\sqrt{3}\right)^2+2\sqrt{5}\sqrt{3}} = \sqrt{a}+\sqrt{b}$$

$\Rightarrow \sqrt{7}-\sqrt{3}+\sqrt{5}+\sqrt{3}=\sqrt{a}+\sqrt{b}$

$\sqrt{7}+\sqrt{5} = \sqrt{a}+\sqrt{b}$

$\Rightarrow a = 7\ b = 5 \Rightarrow \sqrt{ab} = 5.9$

12. (C) $\sqrt{28+10\sqrt{3}}-\sqrt{7-4\sqrt{3}}$

$= (5)^2+\left(\sqrt{3}\right)^2\times2\times5\times\sqrt{3}$ – $\sqrt{2^2+\left(\sqrt{3}\right)^2}$ – $2\times$

$2\sqrt{3}$

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

$= 3+\sqrt{3}\times2=3+2\times1.732$

$= 3 + 3.464$

$= 6.464 \approx 6.5$

13. (D) $\frac{43}{90}+\frac{498}{990}-\frac{36}{90}\times\frac{8}{9}$

$$\frac{971}{990}-\frac{32\times11}{990}$$

$$= \frac{619}{990} = 0.6\overline{25}$$

14. (C) $$\frac{2\sqrt{10}\left(\sqrt{5}+\sqrt{2}+\sqrt{7}\right)}{\left(\sqrt{5}+\sqrt{2}+\sqrt{7}\right)\left(\sqrt{5}+\sqrt{2}+\sqrt{7}\right)}$$

$$= \frac{2\sqrt{10}\left(\sqrt{5}+\sqrt{2}+\sqrt{7}\right)}{2\sqrt{10}}$$

$$= \left(\sqrt{5}+\sqrt{2}+\sqrt{7}\right)$$

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

$$\frac{3}{\sqrt{7}-2}\times\frac{\left(\sqrt{7}+2\right)}{\left(\sqrt{7}+2\right)}=\frac{3\left(\sqrt{7}+2\right)}{3}=\sqrt{7}+2$$

Putting values in ques.

$$= \sqrt{5}+\sqrt{2}+\sqrt{7}-\left(\sqrt{5}-2\right)-\left(\sqrt{7}+2\right)$$

$$= \sqrt{2}$$

15. (A) $24 \times 2 \div 12 + 12 \div 6$ of $2 \div (15 \div 8 \times 4)$ of $(28 \div 7$ of $5)$

$$24 \times 2 \div 12 + 12 \div 12 \div \left(\frac{15}{2}\right)\times\left(\frac{4}{5}\right)$$

$$\frac{24\times2}{12}+12\div12\div6$$

$$4+\frac{12}{12\times6}\Rightarrow4\frac{1}{6}$$

16. (A) $$\frac{85}{9}\div\frac{34}{3}\times\frac{1}{6}+\left(\frac{4}{3}\times\frac{9}{5}\times\frac{5}{3}\right)\times\frac{13}{6}\times\frac{2}{3}\div\frac{4}{3}\times\frac{2}{3}$$

$$\frac{85}{9}\times\frac{9}{17}+(4)\times\frac{13}{9}\div\frac{8}{9}$$

$$\Rightarrow 5+4\times\frac{13}{8}$$

$$\Rightarrow 5+\frac{13}{2}=\frac{23}{2}$$

Diff.$\rightarrow \frac{77}{4}-\frac{23}{2}$

$$\rightarrow \frac{31}{4}\rightarrow7\frac{3}{4}$$

17. (D) $$\frac{(4.6)^4+(5.4)^4+(24.84)^2}{(4.6)^2+(5.4)^2+24.84}$$

$$= \frac{a^4+b^4+a^2b^2}{a^2+b^2+ab}$$

$= a^2 + b^2 - ab$

$= (4.6)^2 + (5.4)^2 - 4.6 \times 5.4$

$= 25.48$

Simplification (MAINS — 2017)

1. Which of the following statement(s) is/are True ?
निम्नलिखित में से कौन-सा/ से कथन सत्य है/ हैं ?

I. $\left(\frac{0.03}{0.2}\right)+\left(\frac{0.003}{0.02}\right)+\left(\frac{0.0003}{0.002}\right)+\left(\frac{0.00003}{0.0002}\right)$ = 0.6.

II. $(0.01) + (0.01)^2 + (0.001)^2 = 0.010101$

(A) Only I/ केवल I
(B) Only II/ केवल II
(C) Neither I nor II/ न तो I न ही II
(D) Both I and II/I तथा II दोनों

2. What is the value of $\frac{1}{(0.1)^2}+\frac{1}{(0.01)^2}+\frac{1}{(0.5)^2}+\frac{1}{(0.05)^2}$?

$\frac{1}{(0.1)^2}+\frac{1}{(0.01)^2}+\frac{1}{(0.5)^2}+\frac{1}{(0.05)^2}$ का मान क्या है ?

(A) 10504 (B) 10404
(C) 10004 (D) 11400

3. Which of the following statement(s) is/are true ?
निम्नलिखित में से कौन सा/ से कथन सत्य है/ हैं ?

I. $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)....\left(1+\frac{1}{998}\right)>497$

II. $14\frac{3}{4}+5\frac{1}{4}-2\frac{1}{2}>11\frac{1}{8}+12\frac{3}{8}-7\frac{1}{4}$

(A) Only I/ केवल I
(B) Only II/ केवल II
(C) Neither I nor II/ न तो I न ही II
(D) Both I and II/I तथा II दोनों

4. Which of the following statement(s) is/are true ?
निम्नलिखित में से कौन सा/ से कथन सत्य है/ हैं ?

I. $\frac{3}{110}<\frac{9}{308}<\frac{7}{225}$

II. $99\frac{1}{7}+99\frac{2}{7}+99\frac{3}{7}+.....99\frac{6}{7}=279$

(A) Only I/ केवल I
(B) Only II/ केवल II
(C) Neither I nor II/ न तो I न ही II
(D) Both I and II/I तथा II दोनों

5. If $f(x) = \frac{1}{x}-\frac{1}{x+1}$, then what is the value of f(1)+ f(2) + f(3) + ... f(10)?

यदि $f(x) = \frac{1}{x}-\frac{1}{x+1}$ है, तो f(1)+ f(2) + f(3) + ... f(10) का मान क्या है ?

(A) $\frac{9}{10}$ (B) $\frac{10}{11}$
(C) $\frac{11}{12}$ (D) $\frac{12}{13}$

6. Which of the following statement(s) is/are true ?
निम्नलिखित में से कौन सा/ से कथन सत्य है/ हैं ?

I. $\sqrt{121}+\sqrt{12321}+\sqrt{1234321}=1233$

II. $\sqrt{0.64}+\sqrt{64}+\sqrt{36}+\sqrt{0.36}>15$

(A) Only I/ केवल I (B) Only II/ केवल II
(C) Neither I nor II/ न तो I न ही II
(D) Both I and II/I तथा II दोनों

7. What is the value of $\left(2+\sqrt{2}\right)+\left(\frac{1}{2+\sqrt{2}}\right)+\left(\frac{1}{2-\sqrt{2}}\right)+\left(2-\sqrt{2}\right)$?

$\left(2+\sqrt{2}\right)+\left(\frac{1}{2+\sqrt{2}}\right)+\left(\frac{1}{2-\sqrt{2}}\right)+\left(2-\sqrt{2}\right)$ का मान क्या है ?

(A) 2 (B) 4
(C) 8 (D) 6

8. What is the value of $\frac{5.6\times0.36+0.42\times3.2}{0.8\times2.1}$?

$\frac{5.6\times0.36+0.42\times3.2}{0.8\times2.1}$ का मान क्या है ?

(A) 2 (B) 1
(C) 3 (D) $\frac{3}{2}$

9. What is the value of

$$\frac{(1.2)^3+(0.8)^3+(0.7)^3-2.016}{(1.35)\left[(1.2)^2+(0.8)^2+(0.7)^2-0.96-0.84-0.56\right]}?$$

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$\frac{(1.2)^3+(0.8)^3+(0.7)^3-2.016}{(1.35)\left[(1.2)^2+(0.8)^2+(0.7)^2-0.96-0.84-0.56\right]}$ का मान क्या है ?

(A) $\frac{1}{4}$ (B) $\frac{1}{2}$

(C) 1 (D) 2

10. What is the unit digit of $(217)^{413} \times (819)^{547} \times (41(D)^{624} \times (34(B)^{812}$?

$(217)^{413} \times (819)^{547} \times (41(D)^{624} \times (34(B)^{812}$ का इकाई अंक क्या है ?

(A) 2 (B) 4

(C) 6 (D) 8

11. What is the value of $S = \frac{1}{1\times3\times5}+\frac{1}{1\times4}+\frac{1}{3\times5\times7}+\frac{1}{4\times7}+\frac{1}{5\times7\times9}+\frac{1}{7\times10}$ + ... upto 20 terms, then what is the value of S?

$S = \frac{1}{1\times3\times5}+\frac{1}{1\times4}+\frac{1}{3\times5\times7}+\frac{1}{4\times7}+\frac{1}{5\times7\times9}+\frac{1}{7\times10}$ + ... 20 पदों तक हैं, तो S का मान क्या है ?

(A) $\frac{6179}{15275}$ (B) $\frac{6070}{14973}$

(C) $\frac{7191}{15174}$ (D) $\frac{5183}{16423}$

12. Which of the following is true ?

निम्नलिखित में से कौन-सा सत्य है ?

I. $\frac{1}{\sqrt[3]{12}} > \frac{1}{\sqrt[4]{29}} > \frac{1}{\sqrt{5}}$

II. $\frac{1}{\sqrt[4]{29}} > \frac{1}{\sqrt[3]{12}} > \frac{1}{\sqrt{5}}$

III. $\frac{1}{\sqrt{5}} > \frac{1}{\sqrt[3]{12}} > \frac{1}{\sqrt[4]{29}}$

IV. $\frac{1}{\sqrt{5}} > \frac{1}{\sqrt[4]{29}} > \frac{1}{\sqrt[3]{12}}$

(A) Only I/ केवल I

(B) Only II/ केवल II

(C) Only III/ केवल III

(D) Only IV/ केवल IV

13. Which of the following is True?

निम्नलिखित में से कौन-सा सत्य है ?

I. $\sqrt[3]{11} > \sqrt{7} > \sqrt[4]{45}$ II. $\sqrt{7} > \sqrt[3]{11} > \sqrt[4]{45}$

III. $\sqrt{7} > \sqrt[4]{45} > \sqrt[3]{11}$ IV. $\sqrt[4]{45} > \sqrt{7} > \sqrt[3]{11}$

(A) Only I/ केवल I (B) Only II/ केवल II

(C) Only III/ केवल III (D) Only IV/ केवल IV

14. What is the value of $14^3 + 16^3 + 18^3 + ... + 30^3$?

$14^3 + 16^3 + 18^3 + ... + 30^3$ का मान क्या है ?

(A) 134576 (B) 120212

(C) 115624 (D) 111672

15. What is the value of $\sqrt{4600+\sqrt{540+\sqrt{1280+\sqrt{250+\sqrt{36}}}}}$?

$\sqrt{4600+\sqrt{540+\sqrt{1280+\sqrt{250+\sqrt{36}}}}}$ का मान क्या है ?

(A) 69 (B) 68

(C) 70 (D) 72

16. If N = 0.369369369369... and M = 0.531531531531..., then what is the value of $\left(\frac{1}{N}\right)+\left(\frac{1}{M}\right)$?

यदि N = 0.369369369369... तथा M = 0.531531531531... है, तो $\left(\frac{1}{N}\right)+\left(\frac{1}{M}\right)$ का मान क्या है ?

(A) $\frac{11100}{2419}$ (B) $\frac{111}{100}$

(C) $\frac{1897}{3162}$ (D) $\frac{2419}{11000}$

17. If $A = \frac{0.216+0.008}{0.36+0.04-0.12}$ and $B = \frac{0.729-0.027}{0.81+0.09+0.27}$, then what is the value of $(A^2 + B^2)^2$?

यदि $A = \frac{0.216+0.008}{0.36+0.04-0.12}$ तथा $B = \frac{0.729-0.027}{0.81+0.09+0.27}$ हो, तो $(A^2 + B^2)^2$ का मान क्या है ?

(A) 0.8 (B) 1

(C) 1.4 (D) 2.2

18. If A = $\frac{1}{1\times2}+\frac{1}{1\times4}+\frac{1}{2\times3}+\frac{1}{4\times7}+\frac{1}{3\times4}+$ $\frac{1}{7\times10}$ ..... upto 20 terms, then what is the value of A ?

यदि A = $\frac{1}{1\times2}+\frac{1}{1\times4}+\frac{1}{2\times3}+\frac{1}{4\times7}+\frac{1}{3\times4}+$ $\frac{1}{7\times10}$ ..... 20 पदों तक हो, तो A का मान क्या है ?

(A) $\frac{379}{308}$ (B) $\frac{171}{140}$

(C) $\frac{379}{310}$ (D) $\frac{420}{341}$

19. If A = $3\frac{1}{4}\times4\frac{1}{4}\div34-\frac{47}{32}+\frac{47}{16}$ and B = $2\frac{1}{2}+5\frac{1}{2}\div55-\frac{11}{10}$, then what is the value of A – B ?

यदि A = $3\frac{1}{4}\times4\frac{1}{4}\div34-\frac{47}{32}+\frac{47}{16}$ तथा B = $2\frac{1}{2}+5\frac{1}{2}\div55-\frac{11}{10}$ हो, तो A – B का मान क्या है ?

(A) $\frac{5}{8}$ (B) 1

(C) 0 (D) $\frac{3}{8}$

20. Which of the following statement(s) is/are true?
I. $(65)^{1/6} > (17)^{1/4} > (12)^{1/3}$
II. $(17)^{1/4} > (65)^{1/6} > (12)^{1/3}$
III. $(12)^{1/3} > (17)^{1/4} > (65)^{1/6}$
निम्नलिखित कथन/ कथनों में से कौन-सा/से सही है/हैं ?
I. $(65)^{1/6} > (17)^{1/4} > (12)^{1/3}$
II. $(17)^{1/4} > (65)^{1/6} > (12)^{1/3}$
III. $(12)^{1/3} > (17)^{1/4} > (65)^{1/6}$
(A) Only I/ केवल I
(B) Only III/ केवल III
(C) Only II// केवल II
(D) None of these/ इनमें से कोई नहीं

21. What is the value of $\frac{1}{0.2}+\frac{1}{0.02}+\frac{1}{0.002}+.....$ upto 9 terms.

$\frac{1}{0.2}+\frac{1}{0.02}+\frac{1}{0.002}+.....$ 9 पदों तक का मान क्या है ?

(A) 222222222 (B) 111111111
(C) 555555555 (D) 525252525

22. What is the value of $\frac{3.6\times1.62+0.48\times3.6}{1.8\times0.8+10.8\times0.3-2.16}$?

$\frac{3.6\times1.62+0.48\times3.6}{1.8\times0.8+10.8\times0.3-2.16}$ का मान क्या है ?

(A) 2.4 (B) 2
(C) 4 (D) 3

23. If $\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{x}}}}=\frac{5}{8}$, then what is the value of x?

यदि $\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{x}}}}=\frac{5}{8}$ हो, तो x का मान क्या है ?

(A) 2 (B) 3
(C) 1 (D) 4

24. If $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{4}\right)\left(1+\frac{1}{6}\right)\left(1+\frac{1}{8}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)=1+\frac{1}{x}$, then what is the value of x ?

यदि $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{4}\right)\left(1+\frac{1}{6}\right)\left(1+\frac{1}{8}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{7}\right)=1+\frac{1}{x}$ हो, तो x का मान क्या है ?

(A) 6 (B) 8
(C) 5 (D) 7

25. What is the value of $\frac{1}{3\times7}+\frac{1}{7\times11}+\frac{1}{11\times15}+.....+\frac{1}{899\times903}$?

$\frac{1}{3\times7}+\frac{1}{7\times11}+\frac{1}{11\times15}+.....+\frac{1}{899\times903}$ का मान क्या है ?

(A) $\frac{21}{509}$ (B) $\frac{18}{403}$ (C) $\frac{25}{301}$ (D) $\frac{29}{31}$

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26. What is the value of $\sqrt{121}+\sqrt{12321}+\sqrt{1234321}+\sqrt{123454321}$?

$\sqrt{121}+\sqrt{12321}+\sqrt{1234321}+\sqrt{123454321}$ का मान क्या है ?

(A) 12345 (B) 123456
(C) 12344 (D) 123454

27. Which of the following statement(s) is/are TRUE?

निम्नलिखित में से कौन-सा/ से कथन सत्य है/ हैं ?

I. $33^3 > 3^{33}$

II. $333 > (3(^3))^3$

(A) Only I/ केवल I

(B) Only II/ केवल II

(C) Both I and II/I और II दोनों

(D) Neither I nor II/ न तो I न ही II

28. If $P = 2^2 + 6^2 + 10^2 + 14^2 + \ldots 94^2$ and $Q = 1^2 + 5^2 + 9^2 + \ldots 81^2$, then what is the value of P – Q?

यदि $P = 2^2 + 6^2 + 10^2 + 14^2 + \ldots 94^2$ तथा $Q = 1^2 + 5^2 + 9^2 + \ldots 81^2$ हैं, तो P – Q का मान क्या है ?

(A) 24645 (B) 26075
(C) 29317 (D) 31515

29. If $A = \left(\frac{1}{0.4}\right)+\left(\frac{1}{0.04}\right)+\left(\frac{1}{0.004}\right)+$ ..... upto 8 terms, then what is the value of A?

यदि $A = \left(\frac{1}{0.4}\right)+\left(\frac{1}{0.04}\right)+\left(\frac{1}{0.004}\right)+$ ... 8 पदों तक हैं, तो A का मान क्या है ?

(A) 27272727.5 (B) 25252525.5
(C) 27777777.5 (D) 25555555.5

30. If $M = 0.1 + (0.1)^2 + (0.01)^2$ and $N = 0.3 + (0.03)^2 + (0.003)^2$, then what is the value of M + N?

यदि $M = 0.1 + (0.1)^2 + (0.01)^2$ तथा $N = 0.3 + (0.03)^2 + (0.003)^2$ हैं, तो M + N का मान क्या है ?

(A) 0.411009 (B) 0.413131
(C) 0.313131 (D) 0.131313

31. If $P = \frac{96}{95\times97}$, $Q = \frac{97}{96\times98}$ and $R = \frac{1}{97}$, then which of the following is True ?

यदि $P = \frac{96}{95\times97}$, $Q = \frac{97}{96\times98}$ तथा $R = \frac{1}{97}$ हैं, तो निम्नलिखित में से कौन-सा सत्य है ?

(A) P < Q < R (B) R < Q < P
(C) Q < P < R (D) R < P < Q

32. Which of the following statement(s) is/ are true?

निम्नलिखित में से कौन-सा/ से कथन सत्य है/ हैं ?

I. $11\frac{1}{2}+17\frac{3}{4}-5\frac{1}{5}-2\frac{1}{10}=\frac{439}{20}$

II. $\frac{9}{1078}>\frac{11}{1127}>\frac{12}{1219}$

III. $\frac{149}{151}>\frac{153}{155}>\frac{157}{159}$

(A) Only I/ केवल I

(B) Only II/ केवल II

(C) Only III/ केवल III

(D) None is true/कोई सत्य नहीं है

33. Which of the following statement(s) is/ are true ?

निम्नलिखित में से कौन सा/ से कथन सत्य है/ हैं ?

I. $\frac{2}{3\sqrt{5}}<\frac{3}{2\sqrt{5}}<\frac{5}{4\sqrt{3}}$

II. $\frac{3}{2\sqrt{5}}<\frac{2}{3\sqrt{3}}<\frac{7}{4\sqrt{5}}$

(A) Only I/ केवल I

(B) Only II/ केवल II

(C) Both I and II/I और II दोनों

(D) Neither I nor II/ न तो I न ही II

34. If $M = \left(\frac{3}{7}\right)\div\left(\frac{6}{5}\right)\times\left(\frac{2}{3}\right)+\left(\frac{1}{5}\right)\times\left(\frac{3}{2}\right)$ and $N = \left(\frac{2}{5}\right)\times\left(\frac{5}{6}\right)\div\left(\frac{1}{3}\right)+\left(\frac{3}{5}\right)\times\left(\frac{2}{3}\right)\div\left(\frac{3}{5}\right)$, then what is the value of $\frac{M}{N}$?

यदि $M = \left(\frac{3}{7}\right)\div\left(\frac{6}{5}\right)\times\left(\frac{2}{3}\right)+\left(\frac{1}{5}\right)\times\left(\frac{3}{2}\right)$ तथ $N = \left(\frac{2}{5}\right)\times\left(\frac{5}{6}\right)\div\left(\frac{1}{3}\right)+\left(\frac{3}{5}\right)\times\left(\frac{2}{3}\right)\div\left(\frac{3}{5}\right)$ हैं, तो $\frac{M}{N}$ का मान क्या है ?

(A) $\frac{207}{560}$ (B) $\frac{339}{1120}$

(C) $\frac{113}{350}$ (D) $\frac{69}{175}$

35. Which of the following statement(s) is/are TRUE?
निम्नलिखित में से कौन-सा/ से कथन सत्य है/ हैं ?

I. $\sqrt{(64)} + \sqrt{(0.0064)} + \sqrt{(0.81)} + \sqrt{(0.0081)} = 9.07$

II. $\sqrt{(0.010201)} + \sqrt{(98.01)} + \sqrt{(0.25)} = 11.51$

(A) Only I
(B) Only II
(C) Both I and II
(D) Neither I nor II

36. Which of the following statement(s) is/are TRUE?
निम्नलिखित में से कौन-सा/ से कथन सत्य है/ हैं ?

I. $(0.7)^2 + (0.07)^2 + (11.(A)^2 > 123.8$

II. $(1.1(B)^2 + (10.(C)^2 + (1.05)^2 > 108.3$

(A) Only I/ केवल I
(B) Only II/ केवल II
(C) Both I and II/I और II दोनों
(D) Neither I nor II/ न तो I न ही II

37. Which of the following statement(s) is/are true?
निम्नलिखित में से कौन-सा/ से कथन सत्य है/ हैं ?

I. $\frac{1}{1\times3} + \frac{1}{3\times5} + \frac{1}{5\times7} + ... + \frac{1}{11\times13} = \frac{12}{13}$

II. $\frac{1}{1\times2} + \frac{1}{2\times3} + \frac{1}{3\times4} + ... + \frac{1}{12\times13} = \frac{12}{13}$

(A) Only I/ केवल I
(B) Only II/ केवल II
(C) Both I and II/I और II दोनों
(D) Neither I nor II/ न तो I न ही II

38. Which of the following statement(s) is/are TRUE?
निम्नलिखित में से कौन-सा/ से कथन सत्य है/ हैं ?

I. $\frac{3}{71} < \frac{5}{91} < \frac{7}{99}$

II. $\frac{11}{135} > \frac{12}{157} > \frac{13}{181}$

(A) Only I/ केवल I
(B) Only II/ केवल II
(C) Both I and II/I और II दोनों
(D) Neither I nor II/ न तो I न ही II

39. If $1 + \left(\frac{1}{2}\right) + \left(\frac{1}{3}\right) + ... + \left(\frac{1}{20}\right) = k$, then what is the value of $\left(\frac{1}{4}\right) + \left(\frac{1}{6}\right) + \left(\frac{1}{8}\right) .... + \left(\frac{1}{40}\right)$?

यदि $1 + \left(\frac{1}{2}\right) + \left(\frac{1}{3}\right) + ... + \left(\frac{1}{20}\right) = k$ है, तो $\left(\frac{1}{4}\right) + \left(\frac{1}{6}\right) + \left(\frac{1}{8}\right) .... + \left(\frac{1}{40}\right)$ का मान क्या है ?

(A) $\frac{k}{2}$ (B) 2k

(C) $\frac{(k-1)}{2}$ (D) $\frac{(k+1)}{2}$

40. Which of the following statement(s) is/are TRUE?
निम्नलिखित में से कौन-सा/ से कथन सत्य है/ हैं ?

I. $\sqrt{5} + \sqrt{5} > \sqrt{7} + \sqrt{3}$

II. $\sqrt{6} + \sqrt{7} > \sqrt{8} + \sqrt{5}$

III. $\sqrt{3} + \sqrt{9} > \sqrt{6} + \sqrt{6}$

(A) Only I/केवल I
(B) Only I and II/ केवल I तथा II
(C) Only II and III/ केवल II तथा III
(D) Only I and III/ केवल I तथा III

41. If $a = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $b = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$, then what is the value of $a^2 + b^2 = ab$?

यदि $a = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ तथा $b = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ हैं, तो $a^2 + b^2 = ab$ का मान क्या है ?

(A) 97 (B) $\left(2\sqrt{3}\right) + 2$

(C) $\left(4\sqrt{6}\right) + 1$ (D) 98

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Solution

1. (D) $\frac{0.03}{0.020}+\frac{0.003}{0.02}+\frac{0.0003}{0.002}+\frac{0.00003}{0.0002}$

$\frac{3}{20}+\frac{3}{20}+\frac{3}{20}+\frac{3}{20}$

$=\frac{12}{20}=0.6$ .... (I)

$\Rightarrow 0.01+0.0001+0.000001=0.010101$ .....

(II)

So both I and II is correct

2. (A) $\frac{1}{(0.1)^2}+\frac{1}{(.5)^2}+\frac{1}{(0.01)^2}+\frac{1}{(0.05)^2}$

$\Rightarrow (10)^2+(2)^2+(100)^2+(20)^2$

$\Rightarrow 10504$

3. (A) (I) $\frac{3}{2}\times\frac{4}{3}\times\frac{5}{4}.....\frac{999}{998}=\frac{999}{2}$

$=499.557497$ (I)

(II) $(14+5-2)+\frac{3}{4}+\frac{1}{4}-\frac{1}{2}=17\frac{1}{2}$

$(11+12-7)+\left(\frac{1}{8}+\frac{3}{8}-\frac{1}{4}\right)=16\frac{1}{4}$

So I and II both are correct

4. (A) (I) $\frac{3}{110}$ $\quad$ $\frac{9}{308}$

$924<990$ so $\frac{3}{110}<\frac{9}{308}$

$\frac{9}{308}$ $\quad$ $\frac{7}{225}$

$2025<2156$ So $\frac{9}{308}<\frac{7}{225}$

(II) $99\times 6+\left(\frac{1}{7}+\frac{2}{7}+\frac{3}{7}+....\frac{6}{7}\right)$

$594+3=597$

So only I is correct and II is false.

5. (B) $f(1)+f(2)+f(3)+.....f(10)$

$=1-\frac{1}{2}+\frac{1}{2}-\frac{1}{3}+\frac{1}{3}-\frac{1}{4}+.....\frac{1}{10}-\frac{1}{11}$

$=1-\frac{1}{11}=\frac{10}{11}$

6. (D) (I) $\sqrt{121}+\sqrt{12321}+\sqrt{1234321}$

$11+111+1111=1233$

(II) $0.8+8+6+0.6$

$=15.4>15$

So Both I & II are correct.

7. (D) $\left(2+\sqrt{2}\right)+\left(2-\sqrt{2}\right)+\frac{1}{2+\sqrt{2}}+\frac{1}{2-\sqrt{2}}$

$=4+\frac{4}{2}=6$

8. (A) $\frac{(5.6\times 0.36)+(0.42\times 3.2)}{0.8\times 2.1}$

$=\frac{.8\times 2.1(1.2+0.8)}{0.8\times 2.1}$

$=1.2+.8=2$

9. (D) $\frac{(1.2)^3+(0.8)^3+(0.7)^3-2.016}{\left\{1.35\left[(1.2)^2+(0.8)^2+(0.7)^2-0.96-0.84-0.56\right]\right\}}$

$\frac{a^3+b^3+c^3-3abc}{\frac{1}{2}(a+b+c)\left[a^2+b^2+c^2-ab-bc-ca\right]}$

$=\frac{(a+b+c)\left(a^2+b^2+c^2-ab-bc-ca\right)}{\frac{1}{2}(a+b+c)\left(a^2+b^2+c^2-ab-bc-ca\right)}$

$=2$

10. (D) $(217)^{413}\times(819)^{547}\times(414)^{624}\times(342)^{812}$

Unit digit of every numbers $=7\times 9\times 6\times 6$

$=63\times 36=18$

So, 8 = unit digit

11. (B)

12. (C) $\frac{1}{\sqrt[3]{12}},\frac{1}{\sqrt[4]{24}},\frac{1}{\sqrt{5}}$

(i) $\sqrt[3]{12}=(12)^{\frac{1}{3}}$ LCM of 3, 4, 2, = 12

(ii) $\sqrt[4]{29}=(29)^{\frac{1}{4}}$

(iii) $\sqrt{5}=(5)^{\frac{1}{2}}$

$(12)^4$ $\quad$ $(29)^3$ $\quad$ $(5)^6$

$\downarrow$ $\quad$ $\downarrow$ $\quad$ $\downarrow$

20736 $\quad$ 24389 $\quad$ 15625

$=\frac{1}{20736},\frac{1}{24389},\frac{1}{15625}$

(i) $\quad$ (ii) $\quad$ (iii)

$= \frac{1}{\sqrt{5}} > \frac{1}{\sqrt[3]{12}} > \frac{1}{\sqrt[4]{29}}$

13. (C) $\sqrt[3]{11}, \sqrt{7}, \sqrt[4]{45}$

$11^{\frac{1}{3}}, 7^{\frac{1}{2}}, 45^{\frac{1}{4}}$

LCM of 3, 4, 2 = 12

$(11)^4$	$(7)^6$	$(45)^3$
↓	↓	↓
14641	117649	191125

$\sqrt{7} > \sqrt[4]{45} > \sqrt[3]{11}$

14. (D) $14^3 + 16^3 + 18^3 \ldots\ldots 30^3$

$8(7^3 + 8^3 \ldots\ldots 15^3)$

$1^3 + 2^3 + 3^3 \ldots\ldots N^3 = \left[\left(\frac{N(N+1)}{2}\right)\right]^2$

$8\left[\left(\frac{15(15+1)}{2}\right)\right]^2 - \left[\left(\frac{6(6+1)}{2}\right)\right]^2$

$= 8\left((120)^2 - (21)^2\right)$

$= 8 \times 141 \times 99 = 111672$

15. (B) $\sqrt{4600 + \sqrt{540 + \sqrt{1280 + \sqrt{250 + \sqrt{36}}}}} = 68$

16. (A) $N = 0.\overline{369} = \frac{369}{999} \Rightarrow \frac{1}{N} = \frac{999}{369}$

$M = 0.\overline{531} = \frac{531}{999} \Rightarrow \frac{1}{M} = \frac{999}{531}$

$\frac{1}{N} + \frac{1}{M} = \frac{999}{369} + \frac{999}{531} = 999\left[\frac{900}{369 \times 531}\right]$

$= \frac{11100}{2419}$

17. (B) $A = \frac{0.216 + 0.008}{0.36 + 0.04 - 0.12} =$

$= \frac{(0.6)^3 + (0.2)^3}{(0.6)^2 + (0.2)^2 - (0.6)(0.2)} \Rightarrow A = 0.8$

$B = \frac{0.79 - 0.027}{0.81 + 0.09 + 0.27}$

$= \frac{(0.9)^3 - (0.3)^3}{(0.9)2 + (0.3)2 + (0.9)(0.3)} \Rightarrow B = 0.6$

$(A^2 + B^2)^2 = [(0.8)^2 + (0.6)^2]^2 = [1]^2 = 1$

18. (D) $A = \frac{1}{1\times2} + \frac{1}{1\times4} + \frac{1}{2\times3} + \ldots\ldots + \frac{1}{7\times10} \ldots\ldots$ upto 20 terms

$A = \left[\frac{1}{1\times2} + \frac{1}{2\times3} + \ldots\ldots \frac{1}{10\times11}\right] + \left[\frac{1}{1\times4} + \frac{1}{4\times7} + \ldots\ldots \frac{1}{27\times31}\right]$

$A = \left[1 - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \ldots\ldots \frac{1}{10} - \frac{1}{11}\right] + \frac{1}{3}\left[1 - \frac{1}{4} + \frac{1}{4} - \frac{1}{7} + \ldots\ldots + \frac{1}{27} - \frac{1}{31}\right]$

$= 1 - \frac{1}{11} + \frac{1}{3}\left[1 - \frac{1}{31}\right] = \frac{10}{11} + \frac{30}{3\times31} = \frac{420}{341}$

19. (D) $A = \frac{13}{4} \times \frac{17}{4} \times \frac{1}{34} - \frac{47}{32} + \frac{47}{16} = \frac{13 - 47 + 94}{32}$

$= \frac{60}{32} = \frac{15}{8}$

$B = \frac{5}{2} + \frac{11}{2} \times \frac{1}{55} - \frac{11}{10} = \frac{3}{2}$

$A - B = \frac{15}{8} - \frac{3}{2} = \frac{3}{8}$

20. (C) I. $(65)^{\frac{1}{6}} > (17)^{\frac{1}{4}} > (12)^{\frac{1}{3}}$

$(65)^2 > (17)^3 > (12)^4$ ×

II. $(17)^3 > (65)^2 > (12)^4$ ×

III. $(12)^4 > (17)^3 > (65)^2$

So only III is right.

21. (D) $\frac{1}{0.2} + \frac{1}{0.02} + \frac{1}{0.002} + \ldots\ldots$

Acc. of pattern

$\frac{10}{2} + \frac{100}{2} + \frac{1000}{2}$ ..... 9th term will be $\frac{1000000000}{2}$

then addition will be

$\Rightarrow$ 5 + 50 + 500 500000000

22. (D) $n = \frac{3.6\times1.62 + 0.48\times3.6}{1.8\times0.8 + 10.8\times0.3 - 2.16}$

$\Rightarrow n = \frac{36\times162 + 48\times36}{18\times8 + 108\times3 - 216} \times \frac{100}{1000}$

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$\Rightarrow n = \frac{36(162+48)}{18(8+18-22)} \times \frac{1}{10}$

$\Rightarrow n = \frac{36 \times 200}{18 \times 14} \times \frac{1}{10}$

$\Rightarrow n = 3$

23. (A) $\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{x}}}} = \frac{5}{8}$

on revercing

$\Rightarrow 1 + \frac{1}{1+\frac{1}{1+\frac{1}{x}}} = \frac{8}{5} \Rightarrow 1 + \frac{1}{1+\frac{1}{1+\frac{1}{x}}} = \left(\frac{8}{5}-1\right)$

on revercing

$\Rightarrow 1 + \frac{1}{1+\frac{1}{x}} = \frac{5}{3} \Rightarrow \frac{1}{1+\frac{1}{x}} = \frac{5}{3} - 1$

on revercing

$\Rightarrow 1 + \frac{1}{x} = \frac{3}{2} \Rightarrow x = \frac{1}{2} \Rightarrow x = 2$

24. (B) $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{4}\right)\left(1+\frac{1}{6}\right)\left(1+\frac{1}{8}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{5}\right)$

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

$\Rightarrow \frac{3}{2} \times \frac{5}{4} \times \frac{7}{6} \times \frac{9}{8} \times \frac{2}{3} \times \frac{4}{5} \times \frac{6}{7} = 1 + \frac{1}{x}$

$\Rightarrow \frac{9}{8} = 1 + \frac{1}{x} \Rightarrow \frac{1}{x} = \frac{1}{8} \Rightarrow x = 8$

25. (C) $\frac{1}{3\times7} + \frac{1}{7\times11} + \frac{1}{11\times15} \ldots\ldots \frac{1}{899\times903}$

$\Rightarrow \frac{1}{4}\left[\frac{1}{3\times7} + \frac{4}{7\times11} + \frac{4}{11\times15} \ldots\ldots \frac{4}{899\times903}\right]$

$\Rightarrow \frac{1}{4}\left[\frac{1}{3} - \frac{1}{7} + \frac{1}{7} - \frac{1}{11} + \frac{1}{11} - \frac{1}{15} \ldots\ldots \frac{1}{899} - \frac{1}{903}\right]$

$\Rightarrow \frac{1}{4}\left[\frac{1}{3} - \frac{1}{903}\right] \Rightarrow \frac{1}{4}\left[\frac{301-1}{903}\right] \Rightarrow \frac{1}{4}\left[\frac{300}{903}\right]$

$\Rightarrow \frac{25}{301}$

26. (C) $\sqrt{121} + \sqrt{12321} + \sqrt{1234321} + \sqrt{123454321}$

11 + 111 + 1111 + 11111

= 12344

27. (A) $33^3 > 3^{33}$

$33^3 > (3^3)^{11}$

$33^3 > (27)^{11} \Rightarrow (27)^{11} > 33^3$

So, I is false.

II. $333 > (3^3)^3 \Rightarrow 333 > 27^3$

$\Rightarrow 27^3 > 333$

So II is false.

So, neither I nor II.

28. (B) If $P = 2^2 + 6^2 + 10^2 + 14^2 + \ldots\ldots 94^2$ and $Q = 1^2 + 5^2 + 9^2 + \ldots\ldots 81^2$

$P - Q = (2^2 - 1^2) + (6^2 - 5^2) + (10^2 - 9^2) + \ldots\ldots (82^2 - 81^2) + 86^2 + 90^2 + 94^2$

$= \underset{\text{A.P.}}{\frac{3+11+19+\ldots\ldots\ldots163}{}} + 86^2 + 90^2 + 94^2$

$= \frac{21}{2}[6 + 20 \times 8] + + 86^2 + 90^2 + 94^2 = 26075$

29. (C) $A = \frac{10}{4} + \frac{100}{4} + \ldots\ldots + \frac{100000000}{4}$

$= \frac{11111110}{4} = 2777777.5$

30 (A) $M = 0.1 + 0.01 + 0.0001$

$N = 0.3 + 0.0009 + 0.000009$

$M + N = 0.411009$

31. (B) $P = \frac{96}{95\times97}$, $Q = \frac{97}{96\times98}$, $R = \frac{1}{97}$

From P and R

$\frac{96}{95\times97} > \frac{1}{97}$

$96 > 95$

and from Q and R

$(97)^2 > 96 \times 98$

$\Rightarrow (97)^2 > (97-1)(97+1)$

$\Rightarrow (97)^2 > (97)^2 - 1$

So, R < Q < P

32. (A) $11\frac{2}{4} + 17\frac{3}{4} - 5\frac{2}{10} - 2\frac{1}{10} = \frac{439}{20}$

$\Rightarrow 28\frac{5}{4} - 7\frac{3}{10} \Rightarrow 28\frac{25}{20} - 7\frac{6}{20}$

$\Rightarrow 21\frac{19}{20} = \frac{439}{20}$

So as per options only (1) is correct.

33. (A) Multipy $\sqrt{3}$

$\frac{2}{3\sqrt{5}} = \frac{2\sqrt{3}}{3\sqrt{15}} = \frac{8\sqrt{3}}{12\sqrt{15}}$ — Same base

(After multiplying $4\sqrt{3}$ m numerator and denominator to make same base)

$\frac{3}{2\sqrt{5}} = \frac{3\sqrt{3}}{2\sqrt{15}} = \frac{18\sqrt{3}}{12\sqrt{15}}$ — Same base

$\frac{5}{4\sqrt{3}} = \frac{5\sqrt{5}}{4\sqrt{15}} = \frac{15\sqrt{3}}{12\sqrt{15}}$ — Same base

Now comparing numerator

$\frac{2}{3\sqrt{5}} < \frac{3}{2\sqrt{5}} < \frac{5}{4\sqrt{3}}$

34. (C) $M = \frac{3}{7}\times\frac{5}{6}\times\frac{2}{3} + \frac{1}{5}\times\frac{3}{2}$

$N = \frac{2}{5}\times\frac{5}{6}\times\frac{3}{1} + \frac{3}{5}\times\frac{2}{3}\times\frac{5}{3}$

$M = \frac{5}{21} + \frac{3}{10} = \frac{113}{210}$

$N = \frac{5}{3}$

$\frac{M}{N} = \frac{113}{210}\times\frac{3}{5} = \frac{113}{350}$

35. (A) (i) $\sqrt{64} + \sqrt{0.0064} + \sqrt{.81} + \sqrt{0.0081} = 9.07$

8 + .08 + 0.9 + 0.09 = 9.07 its true

(ii) $\sqrt{0.010201} + \sqrt{98.01} + \sqrt{0.25} = 11.51$

0.0101 + 9.9 + 0.5 = 10.501 [it is not true]

So only I is follow

36. (B) (i) $(.7)^2 + (0.07)^2 + (11.1)^2 > 123.8$

.49 + 0.0049 + 123.21 = 123.70 [It is not true] 123.80

(ii) $(1.12)^2 + (10.3)^2 + (1.05)^2 > 108.3$

1.2544 + 106.09 + 1.1025 = 108.44 > 108.3

It is true.

37. (B) (i) $\frac{2}{2}\left[\frac{1}{1\times3} + \frac{1}{3\times5} + \frac{1}{5\times7} + ...\right]$

$\frac{1}{2}\left[1 - \frac{1}{3} + \frac{1}{3} - \frac{1}{5} + \frac{1}{5} ..... + \frac{1}{12} - \frac{1}{13}\right]$

$= \frac{1}{2}\left[1 - \frac{1}{13}\right]$

$= \frac{1}{2}\left[\frac{12}{13}\right]$

$= \frac{6}{13}$ but in question given $\frac{12}{13}$ not true.

Alternative

$= \frac{1}{\text{Difference}}\left[\frac{1}{\text{First}} - \frac{1}{\text{last}}\right]$

$= \frac{1}{2}\left[\frac{1}{1} - \frac{1}{13}\right] = \frac{6}{13}$

(ii) $\frac{1}{\text{Difference}}\left[\frac{1}{\text{First}} - \frac{1}{\text{last}}\right]$

$\frac{1}{2-1}\left[\frac{1}{1} - \frac{1}{13}\right] = \frac{1}{1}\left[\frac{12}{13}\right] = \frac{12}{13}$ is true

38. (C) (i) $\frac{3}{71} < \frac{5}{91} < \frac{7}{99}$

Multiply by 100

$\frac{300}{71} < \frac{500}{91} < \frac{700}{99}$

~ 4 < ~ 5 < ~ 6 [it is true]

(ii) $\frac{11}{35} > \frac{12}{157} > \frac{13}{181}$

Again multiply 100

$\frac{1100}{35} > \frac{1200}{157} > \frac{1300}{181}$

~ 8 > ~ 7.64 > ~ 7.18 [it is also true]

39. (C) $1 + \frac{1}{2} + \frac{1}{3} + ... + \frac{1}{20} = K$

$\frac{1}{2} + \frac{1}{3} + ... + \frac{1}{20} = K - 1$

Divide by 2

$\frac{1}{4} + \frac{1}{6} + ... + \frac{1}{40} = \frac{k-1}{2}$

40. (B) (i) $\sqrt{5} + \sqrt{5} > \sqrt{7} + \sqrt{3}$ → Square both side

$20 > 10 + 2\sqrt{21}$ (True)

(ii) $6 + 7 + 2\sqrt{42} + 8 + 5 + 2\sqrt{40}$

$13 + 2\sqrt{42} > 13 + 2\sqrt{40}$ (True)

(iii) $12 + 2\sqrt{27} > 24$

$6\sqrt{3} > 12$ (Wrong)

41. (A) $a = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}\times\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} = 5 + 2\sqrt{6}$

$b = 5 - 2\sqrt{6}$, ab = 1

$a^2 + b^2 - ab$

= 98 – 1 = 97

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Simplification (CHSL — 2019)

1. The difference between two numbers is 43 and their product is 50. Find the sum of their squares.
दो संख्याओं के बीच का अंतर 43 और उनका गुणनफल 50 है। उनके वर्गों का योग ज्ञात कीजिए।
(A) 1947 (B) 1946
(C) 1948 (D) 1949

2. If $\frac{1}{4}$ of $\frac{1}{5}$ of a number is 35, then find $\frac{7}{8}$ of the number.
यदि एक संख्या के $\frac{1}{4}$ का $\frac{1}{5}$, 35 है, तो उस संख्या का $\frac{7}{8}$ कितना होगा ?
(A) 624.5 (B) 723.5
(C) 715 (D) 612.5

3. Find one-fifth of three-eighth of one-third of 11760.
11760 के $\frac{1}{3}$ के $\frac{3}{8}$ का $\frac{1}{5}$ ज्ञात करें।
(A) 598 (B) 294
(C) 645 (D) 467

4. If x is the square of the number when $\left(\frac{2}{5}\text{of}6\frac{1}{4}\div\frac{3}{7}\right)$ of $1\frac{2}{7}$ is divided by $11\frac{1}{4}$, then the value of 81x is :
$\left(\frac{2}{5}\text{of}6\frac{1}{4}\div\frac{3}{7}\right)$ of $1\frac{2}{7}$ को $11\frac{1}{4}$ से विभाजित करने पर प्राप्त संख्या का वर्ग x है। तो 81x का मान ज्ञात कीजिए।
(A) 36 (B) 16
(C) 9 (D) 4

5. $\left[\left\{\left(\frac{2}{3}\right)^3\right\}^{(2x+3)}\right]^{\frac{-3}{4}} = \left[\left\{\left(\frac{2}{3}\right)^{\frac{2}{3}}\right\}^{(3x+7)}\right]^{\frac{-6}{5}}$ then the value of $\sqrt{2-42x}$ is :
यदि $\left[\left\{\left(\frac{2}{3}\right)^3\right\}^{(2x+3)}\right]^{\frac{-3}{4}} = \left[\left\{\left(\frac{2}{3}\right)^{\frac{2}{3}}\right\}^{(3x+7)}\right]^{\frac{-6}{5}}$ है, तो $\sqrt{2-42x}$ का मान ज्ञात कीजिए।
(A) 5 (B) 6
(C) 3 (D) 4

6. Find the value of x, if $21^{\sqrt{x}}+20^{\sqrt{x}} = 29^{\sqrt{x}}$.
यदि $21^{\sqrt{x}}+20^{\sqrt{x}} = 29^{\sqrt{x}}$ है, तो x का मान ज्ञात करें।
(A) 4 (B) 3
(C) 0 (D) 2

7. Simplify the expression.
$25-\left[16-\left\{14-\left(18-\overline{8+3}\right)\right\}\right]$
समीकरण $25-\left[16-\left\{14-\left(18-\overline{8+3}\right)\right\}\right]$ का मान ज्ञात करें।
(A) 14 (B) 15
(C) 17 (D) 16

8. The value of $7+[44\div4+\{9\times2-14\div7\}+5\times2]$ is :
$7+[44\div4+\{9\times2-14\div7\}+5\times2]$ का मान ज्ञात करें।
(A) 55 (B) 33
(C) 67 (D) 44

9. What is the value of the following ?
निम्न का मान क्या होगा ?
$-15+90\div[89-\{9\times8+(33-3\times7)\}]$
(A) 5 (B) 3
(C) 4 (D) 2

10. Which of the following options is completely divisible by 11
निम्न में से कौन सी संख्या 11 से पूर्णत: विभाज्य है ?
(A) 963391 (B) 116571
(C) 809781 (D) 107611

11. Find the value of $2.1+2.25\div[63-\{7.5\times8+(13-2.5\times5)\}]$.
$2.1+2.25\div[63-\{7.5\times8+(13-2.5\times5)\}]$का मान बताइए।
(A) 2.8 (B) 2.9
(C) 3.0 (D) 3.1

12. The value of $[0.9-\{2.3-3.2-(7.1-5.4-3.5)\}]$ is :
$[0.9-\{2.3-3.2-(7.1-5.4-3.5)\}]$ का मान ज्ञात करें।
(A) 0 (B) 1.8
(C) 2.6 (D) 0.18

13. If $A = \left[\frac{3}{7}\text{of}\,4\frac{1}{5} \div \frac{18}{25} + \frac{17}{24}\right]$ of $\left[\frac{289}{16} \div \left(\frac{3}{4} + \frac{2}{3}\right)^2\right]$, then the value of 8A is :

यदि $A = \left[\frac{3}{7}\text{of}\,4\frac{1}{5} \div \frac{18}{25} + \frac{17}{24}\right]$ of $\left[\frac{289}{16} \div \left(\frac{3}{4} + \frac{2}{3}\right)^2\right]$ है तो 8A का मान ज्ञात करें।

(A) 231 (B) 321
(C) 132 (D) 213

14. Evaluate 45 – 5 of (6.3 ÷ 9) + 7 × 0.5.
45 – 5 of (6.3 ÷ 9) + 7 × 0.5. का मान ज्ञात कीजिए।

(A) 40 (B) 45
(C) 50 (D) 42

15. The value of (72 + 34) ÷ 2 + [{(75 ÷ 15) + 6} × 2] is :
(72 + 34) ÷ 2 + [{(75 ÷ 15) + 6} × 2] का मान ज्ञात कीजिए।

(A) 74 (B) 75
(C) 86 (D) 78

16. The value of $4 + \left[3\left\{35 + (42 + 10 \div 2 \times 3 - 40)\right\} + 7\right]$ is:
$4 + \left[3\left\{35 + (42 + 10 \div 2 \times 3 - 40)\right\} + 7\right]$ का मान क्या होगा ?

(A) 157 (B) 167
(C) 185 (D) 163

17. The value of $\left[5\frac{4}{9} \div \left(\frac{11}{4} - \frac{13}{6}\right)^2\right] \div \left[7\frac{3}{11}\text{of}\,8\frac{4}{5} \div 1\frac{5}{7} - \frac{4}{3}\right]^2$ is :

$\left[5\frac{4}{9} \div \left(\frac{11}{4} - \frac{13}{6}\right)^2\right] \div \left[7\frac{3}{11}\text{of}\,8\frac{4}{5} \div 1\frac{5}{7} - \frac{4}{3}\right]^2$ का मान ज्ञात कीजिए।

(A) $\frac{1}{81}$ (B) $\frac{1}{61}$
(C) $\frac{1}{71}$ (D) $\frac{1}{91}$

18. Find the value of x in $\sqrt[3]{15625} - \sqrt{x} = 4$.
$\sqrt[3]{15625} - \sqrt{x} = 4$ में x का मान ज्ञात करें।

(A) 625 (B) 343
(C) 441 (D) 81

19. The value of 27 + [3(50 – 20) + 168 ÷ 4 + 2 – 11 × 2] is:
27 + [3(50 – 20) + 168 ÷ 4 + 2 – 11 × 2] का मान ज्ञात करें।

(A) 245 (B) 139
(C) 149 (D) 239

20. Find the value of $225 - \left[42 - \left\{25 - \left(18 - \overline{18+13}\right)\right\}\right]$.
$225 - \left[42 - \left\{25 - \left(18 - \overline{18+13}\right)\right\}\right]$ का मान ज्ञात कीजिए।

(A) 222 (B) 221
(C) 223 (D) 244

21. The value of 72 – 3 (2 + 24 ÷ 4 × 3 – 2 × 2) + 8 is :
72 – 3 (2 + 24 ÷ 4 × 3 – 2 × 2) + 8 का मान बताइए।

(A) 72 (B) 32
(C) 36 (D) 24

23. The value of 10 – [121 ÷ (11 × 11) – (–4) – {3 – (8 – 1)}] is :
10 – [121 ÷ (11 × 11) – (–4) – {3 – (8 – 1)}] का मान ज्ञात करें।

(A) –1 (B) 1
(C) 0 (D) 19

25. What is the value of
(9 + 3 – 16 ÷ 4 + 10) + {(3 + 5 × 2 ÷ 10)} × (18 – 4 of 5) ?
(9 + 3 – 16 ÷ 4 + 10) + {(3 + 5 × 2 ÷ 10)} × (18 – 4 of 5) का मान क्या होगा ?

(A) 15 (B) 10
(C) 5 (D) 8

26. Simplify the following.
निम्न का मान ज्ञात करें।

$4\frac{4}{5} \div \left[2\frac{1}{5} - \frac{1}{2}\left\{1\frac{1}{4} - \left(\frac{1}{4} - \frac{1}{5}\right)\right\}\right]$

(A) 1 (B) 3
(C) 2 (D) 4

27. Find the value of $309 \div \left[\left(\frac{3}{2}\right)\text{of}\,(25 + 35) - 12\frac{3}{4}\right]$.
$309 \div \left[\left(\frac{3}{2}\right)\text{of}\,(25 + 35) - 12\frac{3}{4}\right]$ का मान ज्ञात करें।

(A) 8 (B) 16
(C) 12 (D) 4

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28. The value of $1\frac{3}{4}-\left[3\frac{1}{8}\div\left\{6-\left(2\frac{3}{4}-\frac{11}{12}\right)\right\}\right]$ is :

$1\frac{3}{4}-\left[3\frac{1}{8}\div\left\{6-\left(2\frac{3}{4}-\frac{11}{12}\right)\right\}\right]$ का मान ज्ञात करें।

(A) 1 (B) 2
(C) 3 (D) 0

29. Evaluate : [7 + 7 × (7 + 7 ÷ 7)] + 7 ÷ 7.
[7 + 7 × (7 + 7 ÷ 7)] + 7 ÷ 7 का मूल्याँकन करें।

(A) 10 (B) 5
(C) 63 (D) 64

30. The value of $\frac{4}{5}\div 3\frac{1}{4}$ of $\frac{8}{13}-\frac{\frac{1}{5}-\frac{1}{8}}{\frac{1}{5}+\frac{1}{8}}\times 5\frac{1}{5}+\frac{5}{6}$ is :

$\frac{4}{5}\div 3\frac{1}{4}$ of $\frac{8}{13}-\frac{\frac{1}{5}-\frac{1}{8}}{\frac{1}{5}+\frac{1}{8}}\times 5\frac{1}{5}+\frac{5}{6}$ का मान है :

(A) $\frac{2}{15}$ (B) $\frac{7}{30}$

(C) $\frac{1}{15}$ (D) $\frac{1}{30}$

32. The value of $\frac{\frac{1}{5}\div\frac{1}{5}\times\frac{1}{5}}{\frac{1}{5}\div\frac{1}{5}\text{ of }\frac{1}{5}}-4\frac{1}{5}\div 105$ is :

$\frac{\frac{1}{5}\div\frac{1}{5}\times\frac{1}{5}}{\frac{1}{5}\div\frac{1}{5}\text{ of }\frac{1}{5}}-4\frac{1}{5}\div 105$ का मान निम्नलिखित में से कितना होगा ?

(A) 0 (B) 2
(C) 10 (D) 5

33. The value of $\frac{33}{40}+\frac{1}{5}\left[\frac{4}{5}-\frac{1}{5}\times\left(\frac{7}{8}-\frac{5}{4}\right)\right]$ is :

$\frac{33}{40}+\frac{1}{5}\left[\frac{4}{5}-\frac{1}{5}\times\left(\frac{7}{8}-\frac{5}{4}\right)\right]$ का मान है :

(A) 5 (B) 0
(C) 10 (D) 1

34. The value of

$75\frac{3}{5}\div\left[15\div 3\text{ of }5+7\div\frac{1}{14}-\left(78\div 3\frac{1}{3}\right)\right]$ is :

$75\frac{3}{5}\div\left[15\div 3\text{ of }5+7\div\frac{1}{14}-\left(78\div 3\frac{1}{3}\right)\right]$ का मान ज्ञात करो ?

(A) 1 (B) 2
(C) 5 (D) 0

35. The value of $2\frac{1}{36}\div\frac{5}{9}\text{of}\left(5\frac{1}{10}+2\frac{1}{5}\right)+\frac{2}{5}\div 3\frac{1}{5}$ is :

मान ज्ञात करो $2\frac{1}{36}\div\frac{5}{9}\text{of}\left(5\frac{1}{10}+2\frac{1}{5}\right)+\frac{2}{5}\div 3\frac{1}{5}$

(A) $\frac{3}{7}$ (B) $\frac{5}{12}$

(C) $\frac{3}{8}$ (D) $\frac{5}{8}$

36. The value of [(3 + 5 – 4) + (17 – 3 × 4)] + [4 ÷ 2 – 16 ÷ 4 + 3] is :
[(3 + 5 – 4) + (17 – 3 × 4)] + [4 ÷ 2 – 16 ÷ 4 + 3] का मान हैं।

(A) 16 (B) 10
(C) 12 (D) 14

37. The value of $3\frac{1}{3}-\left[\frac{9}{4}+\left\{\frac{5}{4}-\frac{1}{13}\times\left(\frac{5}{2}-\frac{1}{3}\right)\right\}\right]$ is :

$3\frac{1}{3}-\left[\frac{9}{4}+\left\{\frac{5}{4}-\frac{1}{13}\times\left(\frac{5}{2}-\frac{1}{3}\right)\right\}\right]$ का मान ज्ञात करें।

(A) 10 (B) 0
(C) 5 (D) 1

Solution

1. (D) ATQ

$x - y = 43$

$xy = 50$

$\Rightarrow x^2 + y^2 = (x-y)^2 + 2xy$

$= (43)^2 + 2 \times 50$

$= 1849 + 100 = 1949$

2. (D) Let Number = x

$\Rightarrow x \times \frac{1}{4} \times \frac{1}{5} = 35$

$\Rightarrow x = 35 \times 20$

So, $\frac{7}{8}x = \frac{7}{8} \times 35 \times 20 = 612.5$

3. (B) $11760 \times \frac{1}{3} \times \frac{3}{8} \times \frac{1}{5} = 294$

4. (A) $\left[\left(\frac{2}{5}\text{of}\frac{25}{4} \div \frac{3}{7}\right)\text{of}\frac{9}{7}\right] \div \frac{45}{4}$

$\Rightarrow \left[\left(\frac{5}{2} \times \frac{7}{3}\right)\text{of}\frac{9}{7}\right] \times \frac{4}{45}$

$\Rightarrow \frac{35}{6} \times \frac{9}{7} \times \frac{4}{45}$

$\Rightarrow \frac{2}{3}$

ATQ

$x = \left(\frac{2}{3}\right)^2 = \frac{4}{9}$

$\Rightarrow 81 \times \frac{4}{9} = 36$

5. (A) $\frac{2}{3}^{-\frac{9}{4}(2x+3)} = \frac{2}{3}^{-\frac{12}{15}(3x+7)}$

$\frac{-9}{4}(2x+3) = \frac{-12}{15}(3x+7)$

$\frac{-9}{4}(2x+3) = \frac{-4}{5}(3x+7)$

$-42x = 23$

$x = -\frac{23}{42}$

$\sqrt{2-42x} = \sqrt{2 + \frac{42 \times 23}{42}}$

$= \sqrt{25}$

$= 5$

6. (A) Only x = 4 satisfies the equation.

7. (D) $25 - [16 - \{14 - (18 - 11)\}]$

$25 - [16 - 7]$

$25 - 9 = 16$

8. (D) $\Rightarrow 7 + 11 + (18 - 2) + 10$

$\Rightarrow 7 + 11 + 16 + 10 = 44$

9. (B) $-15 + 90 \div [89 - \{9 \times 8 + (33 - 3 \times 7)\}]$

$= -15 + 90 \div [89 - 72 - 12]$

$= -15 + 90 \div 5 = 3$

10. (A) Apply divisibility rule of 11

11. (C) $2.1 + 2.25 \div [63 - \{7.5 \times 8 + (13 - 2.5 \times 5)\}]$

$= 2.1 + 2.25 \div [63 - 60.5]$

$= 2.1 + \frac{2.25}{2.50} = 3.0$

12. (A) $[0.9 - \{2.3 - 3.2 - (7.1 - 5.4 - 3.5)\}]$

$[0.9 - 0.9] = 0$

13. (A) $A = \left[\frac{3}{7}\text{of}4\frac{1}{5} \div \frac{18}{25} + \frac{17}{24}\right]\text{of}\left[\frac{289}{16} \div \left(\frac{3}{4} + \frac{2}{3}\right)^2\right]$

$\Rightarrow A = \left[\frac{3}{7} \times \frac{21}{5} \times \frac{25}{18} + \frac{17}{24}\right]\text{of}\left[\frac{289}{16} \times \frac{144}{289}\right]$

$\Rightarrow A = \frac{77}{24} \times 9 = \frac{231}{8}$

So, $8A = \frac{231}{8} \times 8 = 231$

14. (B) $45 - 5\text{ of}(6.3 \div 9) + 7 \times 0.5$

$45 - 3.5 + 3.5 = 45$

15. (B) $(72 + 34) \div 2 + [\{(75 \div 15) + 6\} \times 2]$

$= 106 \div 2 + 22 = 75$

16. (B) $4 + [3\{35 + (42 + 10 \div 2 \times 3 - 40)\} + 7]$

$= 4 + [3\{35 + 17\} + 7] = 167$

17. (A) $\left[5\frac{4}{9} \div \left(\frac{11}{4} - \frac{13}{6}\right)^2\right] \div \left[7\frac{3}{11}\text{of}8\frac{4}{5} \div 1\frac{5}{7} - \frac{4}{3}\right]^2$

$= \left(\frac{49}{9} \div \frac{49}{144}\right) \div \left[\frac{80}{11} \times \frac{44}{5} \times \frac{7}{12} - \frac{4}{3}\right]^2$

$= 16 \div \left[\frac{112 - 4}{3}\right]^2$

$= \frac{16}{36 \times 36} = \frac{1}{81}$

18. (C) $\sqrt[3]{15625} - \sqrt{x} = 4$

$\Rightarrow \sqrt{x} = 25 - 4 = 21$

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$\Rightarrow x = 441$

19. (B) $27 + [3(50 - 20) + 168 \div 4 + 2 - 11 \times 2]$
$= 139$

20. (B) $225 - \left[42 - \left\{25 - \left(18 - \overline{18+13}\right)\right\}\right]$
$= 225 - [42 - 25 - 13]$
$= 221$

22. (B) $72 - 3\left(2 + \frac{24}{4} \times 3 - 4\right) + 8$
$\Rightarrow 72 - (2 + 18 - 4) \times 3 + 8$
$\Rightarrow 72 - 48 + 8$
$\Rightarrow 32$

24. (B) $10 - [121 \div 121 + 4 - (3 - 7)]$
$\Rightarrow 10 - [1 + 4 + 4]$
$\Rightarrow 10 - 9$
$\Rightarrow 1$

25. (B) $\left(12 - \frac{16}{4} + 10\right) + \left(3 + 5 \times \frac{2}{10}\right) \times (18 - 20)$
$\Rightarrow (12 + 6) + 4 \times (-2)$
$\Rightarrow 18 - 8$
$\Rightarrow 10$

26. (B) $4\frac{4}{5} \div \left[2\frac{1}{5} - \frac{1}{2}\left\{1\frac{1}{4} - \left(\frac{1}{4} - \frac{1}{5}\right)\right\}\right]$

$= \frac{24}{5} \div \left[\frac{11}{5} - \frac{1}{2} \times \frac{6}{5}\right]$

$= \frac{24}{5} \times \frac{5}{8} = 3$

27. (D) $309 \div \left[\left(\frac{9}{2}\right) \text{of} (25 + 35) - 12\frac{3}{4}\right]$

$= 309 \div \left[90 - \frac{51}{4}\right]$

$= 309 \times \frac{4}{309} = 4$

28. (A) $\frac{7}{4} - \left[\frac{25}{8} \div \left\{6 - \left(\frac{11}{4} - \frac{11}{12}\right)\right\}\right]$

$\Rightarrow \frac{7}{4} - \left[\frac{25}{8} \div \left\{6 - \frac{11}{6}\right\}\right]$

$\Rightarrow \frac{7}{4} - \left[\frac{25}{8} \times \frac{6}{25}\right]$

$\Rightarrow \frac{7}{4} - \frac{3}{4}$

$\Rightarrow 1$

29. (D) $(7 + 7 \times 8) + 7 - 7$
$7 + 56 + 1$
$\Rightarrow 64$

31. (D) $\frac{4}{5} \div 3\frac{1}{4}$ of $\frac{8}{13} - \frac{\frac{1}{5} - \frac{1}{8}}{\frac{1}{5} + \frac{1}{8}} \times 5\frac{1}{5} + \frac{5}{6}$

$\frac{4}{5} \div \frac{13}{4} \times \frac{8}{13} - \frac{3}{13} \times \frac{26}{5} + \frac{5}{6}$

$\frac{4}{5} \times \frac{1}{2} - \frac{6}{5} + \frac{5}{6}$

$\frac{2}{5} - \frac{6}{5} + \frac{5}{6}$

$\frac{12 - 36 + 25}{30} = \frac{1}{30}$

32. (A) $\frac{\frac{1}{5} \times 5 \times \frac{1}{5}}{\frac{1}{5} \times 25} - \frac{21}{5} \times \frac{1}{105}$

$= \frac{1}{25} - \frac{1}{25} = 0$

33. (D) $\frac{33}{40} + \frac{1}{5}\left[\frac{4}{5} - \frac{1}{5} \times \left(\frac{-3}{8}\right)\right]$

$\frac{33}{40} + \frac{1}{5}\left[\frac{4}{5} + \frac{3}{40}\right]$

$\frac{33}{40} + \frac{1}{5} \times \frac{35}{40} = \frac{40}{40} = 1$

34. (A) $\frac{378}{5} \div \left[15 \div 15 + 7 \times 14 - \frac{234}{10}\right]$

$\frac{378}{5} \div \left[1 + 98 - \frac{234}{10}\right]$

$\frac{378}{5} \div \left[\frac{990 - 234}{10}\right]$

$\frac{378}{5} \div \frac{756}{10}$

$\frac{378}{5} \div \frac{10}{756} \Rightarrow \frac{756}{756} = 1$

35. (D) $\frac{73}{36} \div \frac{5}{9}$ of $\left(\frac{51}{10} + \frac{11}{5}\right) + \frac{2}{5} \div \frac{16}{5}$

$\frac{73}{36} \div \frac{5}{9} \times \frac{73}{10} + \frac{2}{5} \times \frac{5}{16}$

$\frac{73}{36} \times \frac{18}{73} + \frac{1}{8}$

$\frac{1}{2} + \frac{1}{8} \Rightarrow \frac{5}{8}$

36. (B) $\Rightarrow 4 + 5 + [4 \times \frac{1}{2} - 16 \times \frac{1}{4} + 3]$

$\Rightarrow 9 + [2 - 4 + 3]$

$\Rightarrow 9 + 2 - 4 + 3$

$\Rightarrow 10$

37. (B) $\frac{10}{3} - \left[\frac{9}{4} + \left\{\frac{5}{4} - \frac{1}{13} \times \frac{13}{6}\right\}\right]$

$\frac{10}{3} - \left[\frac{9}{4} + \left\{\frac{5}{4} - \frac{1}{6}\right\}\right]$

$\frac{10}{3} - \left[\frac{9}{4} + \frac{21}{24}\right]$

$\frac{10}{3} - \left[\frac{9}{4} + \frac{13}{12}\right]$

$\frac{10}{3} - \left[\frac{160}{4 \times 12}\right] = 0$

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Simplification (CHSL — 2018)

1. The value of $\frac{3\div\{5-5\div(6-7)\times 8+9\}}{4+4\times 4\div 4\text{ of }4}$ is :

$\frac{3\div\{5-5\div(6-7)\times 8+9\}}{4+4\times 4\div 4\text{ of }4}$ का मान है :

(A) $\frac{1}{45}$ (B) $\frac{1}{18}$ (C) $\frac{1}{90}$ (D) $\frac{1}{3}$

2. The value of $3\times 2\div 3$ of $12-3\div 2\times(2-3)\times 2+3\div 2$ of 3 is :

$3\times 2\div 3$ of $12-3\div 2\times(2-3)\times 2+3\div 2$ to 3 का मान है :

(A) $2\frac{1}{3}$ (B) $-2\frac{1}{3}$ (C) $-3\frac{2}{3}$ (D) $3\frac{2}{3}$

3. The simplified value of $3\times 2\div 3$ of $2\times 3\div\left(5+5\times 5\div 5\text{of}5-5\div 10\text{of}\frac{1}{5}\right)$ is :

$3\times 2\div 3$ of $2\times 3\div\left(5+5\times 5\div 5\text{of}5-5\div 10\text{of}\frac{1}{5}\right)$ का सरलीकृत मान होगा :

(A) $\frac{6}{7}$ (B) $\frac{17}{5}$ (C) $\frac{2}{3}$ (D) $\frac{30}{59}$

4. The simplified value of

$\left(\frac{7}{5}\div\frac{7}{10}\text{of}\frac{3}{4}\right)\div\frac{4}{9}-\left(\frac{7}{16}\div 10\frac{1}{2}\times 7\frac{1}{5}\right)\times\frac{5}{12}$ is :

$\left(\frac{7}{5}\div\frac{7}{10}\text{of}\frac{3}{4}\right)\div\frac{4}{9}-\left(\frac{7}{16}\div 10\frac{1}{2}\times 7\frac{1}{5}\right)\times\frac{5}{12}$ का सरलीकृत मान है :

(A) $\frac{47}{8}$ (B) $\frac{39}{4}$ (C) $\frac{49}{8}$ (D) $\frac{41}{4}$

5. What is the simplified value of $5\div 10$ of $10\times 4+4\div 4$ of $4\times 10-(10-4)\div 16\times 4$ = ?

$5\div 10$ of $10\times 4+4\div 4$ of $4\times 10-(10-4)\div 16\times 4$ का सरलीकृत मान क्या है ?

(A) 1.2 (B) 2.5
(C) 21 (D) 58.5

6. The simplified value of $3\times 6\div 4$ to $6-6\div 2\times(4-6)+4-2\times 3\div 6$ of $\frac{1}{3}$ is :

$3\times 6\div 4$ of $6-6\div 2\times(4-6)+4-2\times 3\div 6$ of $\frac{1}{3}$ का सरलीकृत मान है :

(A) $1\frac{3}{4}$ (B) $7\frac{3}{4}$ (C) $13\frac{3}{4}$ (D) $8\frac{1}{3}$

7. The simplified value of 5 of 8 – 6 + [(27 – 3) ÷ 6 – 4] is :

5 of 8 – 6 + [(27 – 3) ÷ 6 – 4] का सरलीकृत मान है :

(A) 114 (B) 120
(C) 124 (D) 116

8. The simplified value of 15 of 8 + 6 + [(27 – 3) ÷ 6 + 4] is :

15 of 8 + 6 + [(27 – 3) ÷ 6 + 4] का सरलीकृत मान है :

(A) 128 (B) 134
(C) 130 (D) 136

9. The simplified value of $\frac{\left(3\frac{1}{5}-\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{7}\div\left\{\frac{6}{7}-\left(\frac{1}{7}\div\frac{1}{5}\right)\right\}}$ is :

$\frac{\left(3\frac{1}{5}-\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{7}\div\left\{\frac{6}{7}-\left(\frac{1}{7}\div\frac{1}{5}\right)\right\}}$ का सरलीकृत मान है :

(A) $\frac{13}{64}$ (B) $\frac{13}{16}$ (C) $\frac{13}{8}$ (D) $\frac{13}{7}$

10. The simplified value of $\frac{\left(3\frac{1}{5}+\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{7}\div\left\{\frac{6}{7}-\left(\frac{1}{7}\div\frac{1}{5}\right)\right\}}$ is :

$\frac{\left(3\frac{1}{5}+\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{7}\div\left\{\frac{6}{7}-\left(\frac{1}{7}\div\frac{1}{5}\right)\right\}}$ का सरलीकृत मान है :

(A) $\frac{19}{7}$ (B) $\frac{19}{8}$ (C) $\frac{19}{16}$ (D) $\frac{19}{64}$

11. The simplified value of $\frac{\left(3\frac{1}{5}+\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{7}\div\left\{\frac{5}{7}+\left(\frac{1}{7}\div\frac{1}{3}\right)\right\}}$ is:

$\frac{\left(3\frac{1}{5}+\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{7}\div\left\{\frac{5}{7}+\left(\frac{1}{7}\div\frac{1}{3}\right)\right\}}$ का सरलीकृत मान ज्ञात कीजिये ?

(A) $\frac{19}{8}$ (B) $\frac{19}{16}$

(C) $\frac{19}{64}$ (D) $\frac{19}{7}$

12. The value of $\frac{\left(3\frac{1}{5}+\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{8}\div\left\{\frac{5}{8}+\left(\frac{1}{8}\div\frac{1}{3}\right)\right\}}$ is:

$\frac{\left(3\frac{1}{5}+\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{8}\div\left\{\frac{5}{8}+\left(\frac{1}{8}\div\frac{1}{3}\right)\right\}}$ का मान ज्ञात कीजिए ?

(A) $\frac{19}{16}$ (B) $\frac{19}{7}$ (C) $\frac{19}{9}$ (D) $\frac{19}{64}$

13. The simplified value of $\frac{46-\frac{3}{4}\text{of}\,32-6}{37-\frac{3}{4}\text{of}(34-6)}$ is :

$\frac{46-\frac{3}{4}\text{of}\,32-6}{37-\frac{3}{4}\text{of}(34-6)}$ का सरलीकृत मान है :

(A) 2 (B) $\frac{19}{16}$ (C) $\frac{19}{64}$ (D) 1

14. The simplified value of $\frac{46-\frac{3}{4}\text{of}32-6}{11+\frac{3}{4}\text{of}(34-6)}$ is:

$\frac{46-\frac{3}{4}\text{of}32-6}{11+\frac{3}{4}\text{of}(34-6)}$ का सरलीकृत मान है:

(A) $\frac{1}{7}$ (B) 1 (C) $\frac{1}{4}$ (D) $\frac{1}{2}$

15. The simplified value of $\frac{46+\frac{3}{4}\text{of}32-6}{11+\frac{3}{4}\text{of}(34-6)}$ is:

$\frac{46+\frac{3}{4}\text{of}32-6}{11+\frac{3}{4}\text{of}(34-6)}$ का मान ज्ञात कीजिए :

(A) 1 (B) $\frac{1}{4}$ (C) 2 (D) $\frac{1}{2}$

16. The simplified value of $\frac{1.0025+6.25\times10^{-6}}{0.0025+0.95}$ is:

$\frac{1.0025+6.25\times10^{-6}}{0.0025+0.95}$ का सरलीकृत मान ज्ञात कीजिये ?

(A) 1.0025 (B) 1.0525
(C) 1.0005 (D) 1.0505

17. The simplified value of $2\frac{1}{3}$ of $\left(\frac{3}{5}\div\frac{2}{9}\right)-\left(4\frac{2}{5}+\frac{19}{20}\div\frac{1}{2}\right)$ is:

$2\frac{1}{3}$ of $\left(\frac{3}{5}\div\frac{2}{9}\right)-\left(4\frac{2}{5}+\frac{19}{20}\div\frac{1}{2}\right)$ का सरलीकृत मान है:

(A) 0 (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) 1

18. The simplified value of $\left[1\frac{1}{5}\text{of}\left\{\frac{3}{7}-\left(1\frac{4}{15}-\frac{13}{15}\right)\times\frac{5}{7}\right\}\right]\div\left(\frac{6}{7}\div5\right)$ is —

$\left[1\frac{1}{5}\text{of}\left\{\frac{3}{7}-\left(1\frac{4}{15}-\frac{13}{15}\right)\times\frac{5}{7}\right\}\right]\div\left(\frac{6}{7}\div5\right)$ का सरलीकृत मान है—

(A) $\frac{2}{15}$ (B) $\frac{1}{5}$ (C) 1 (D) $\frac{4}{15}$

19. The simplified value of $\frac{1}{2}$ of $\frac{8}{5}\div\left\{2\frac{1}{5}-\left(\frac{5}{16}+\frac{3}{5}\times1\frac{7}{8}\div\frac{2}{3}\right)\right\}$ is

$\frac{1}{2}$ of $\frac{8}{5}\div\left\{2\frac{1}{5}-\left(\frac{5}{16}+\frac{3}{5}\times1\frac{7}{8}\div\frac{2}{3}\right)\right\}$ का सरलीकृत मान क्या होगा ?

(A) 1 (B) $\frac{2}{5}$ (C) $\frac{1}{5}$ (D) 4

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20. If $x = \frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15} + \dots \dots + \frac{1}{23.24}$ $y = \frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39} + \dots \dots + \frac{1}{71.72}$, then $\frac{x}{y}$ is equal to —

$x = \frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15} + \dots \dots + \frac{1}{23.24}$ $y = \frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39} + \dots \dots + \frac{1}{71.72}$ है, तो $\frac{x}{y}$ किसके समान होगा ?

(A) $\frac{1}{3}$ (B) $\frac{1}{24}$ (C) $\frac{1}{72}$ (D) 3

21. The simplified value of $\frac{0.01404}{24^2 + 6^2 - 144}$ is —

$\frac{0.01404}{24^2 + 6^2 - 144}$ का सरलीकृत मान क्या होगा ?

(A) 3×10^{-5} (B) 6×10^{-5}
(C) 2.4×10^{-4} (D) 3×10^{-4}

22. The simplified value $\frac{1}{2}$ of $\frac{8}{5} \div \left\{2\frac{1}{5} - \left(\frac{5}{16} + \frac{3}{5} \times 1\frac{7}{8} \div \frac{2}{3}\right)\right\}$ of is—

$\frac{1}{2}$ of $\frac{8}{5} \div \left\{2\frac{1}{5} - \left(\frac{5}{16} + \frac{3}{5} \times 1\frac{7}{8} \div \frac{2}{3}\right)\right\}$ का सरलीकृत मान क्या होगा ?

(A) $\frac{1}{4}$ (B) 4 (C) $\frac{1}{5}$ (D) 5

23. If $\frac{10}{7}(1 - 2.43 \times 10^{-3}) = 1.417 + x$, men x is equan to:

यदि $\frac{10}{7}(1 - 2.43 \times 10^{-3}) = 1.417 + x$ है, तो x बराबर है—

(A) 0.0417
(B) 0.417
(C) 0.0081
(D) 0.81

24. The simplified value of $\left\{1\frac{1}{4} \text{of} \left(2\frac{1}{3} \div 1\frac{2}{5}\right) - 1\frac{5}{12}\right\} + \frac{1}{9} \div 2\frac{1}{3} + \frac{2}{7} + \frac{1}{6}$ is —

$\left\{1\frac{1}{4} \text{of} \left(2\frac{1}{3} \div 1\frac{2}{5}\right) - 1\frac{5}{12}\right\} + \frac{1}{9} \div 2\frac{1}{3} + \frac{2}{7} + \frac{1}{6}$ का सरलीकृत मान है—

(A) $\frac{7}{3}$ (B) $\frac{3}{2}$ (C) $\frac{7}{6}$ (D) 1

25. The value of $\frac{18.43 \times 18.43 - 6.57 \times 6.57}{11.86}$ is —

$\frac{18.43 \times 18.43 - 6.57 \times 6.57}{11.86}$ का मान है—

(A) 23.62 (B) 25
(C) 26 (D) 24.12

26. If $(1.25)(1 - 6.4 \times 10^{-5}) = 1.2496 + a$, then a is equal to:

अगर $(1.25)(1 - 6.4 \times 10^{-5}) = 1.2496 + a$ है, तो a बराबर है:

(A) 0.0016 (B) 0.00016
(C) 0.0032 (D) 0.00032

27. The simplified value of $\frac{2}{3} \div \left\{\frac{3}{7} \text{of} \frac{14}{5} \times 1\frac{2}{3} - \left(3\frac{1}{2} - 2\frac{1}{6}\right)\right\}$ is —

$\frac{2}{3} \div \left\{\frac{3}{7} \text{of} \frac{14}{5} \times 1\frac{2}{3} - \left(3\frac{1}{2} - 2\frac{1}{6}\right)\right\}$ का सरलीकृत मान है—

(A) $\frac{1}{3}$ (B) 1 (C) 2 (D) $\frac{2}{3}$

28. The simplified value of $20 - [2.8 \times 5 \div 0.7 - 3 \div 0.9 \times 1.5 + 2]$ is equal to:

$20 - [2.8 \times 5 \div 0.7 - 3 \div 0.9 \times 1.5 + 2]$ का सरलीकृत मान क्या होगा ?

(A) 3 (B) 3.4
(C) 3.8 (D) 3.6

Solution

1. (C) $\dfrac{3\div\{5+5\times8+9\}}{4+\dfrac{4\times4}{16}}$

$= \dfrac{3\div\{14+40\}}{5} = \dfrac{3}{54\times5}$

$= \dfrac{1}{18\times5} = \dfrac{1}{90}$

2. (D) $\dfrac{3\times2}{36}+\dfrac{3}{2}\times2+\dfrac{3}{6}$

$\dfrac{1}{6}+3+\dfrac{1}{2}$

$= \dfrac{1+18+3}{6}=\dfrac{11}{3}=3\dfrac{2}{3}$

3. (A) Using BODMAS Rule

$3 \times 2 \div 6 \times 3 \div [5 + 5 \times 5 \div 25 - 5 \div 2]$

$3 \div \left[5+1-\dfrac{5}{2}\right]$

$3 \div \left[6-\dfrac{5}{2}\right]$

$= 3 \div \dfrac{7}{2}$

$= 3 \times \dfrac{2}{7}=\dfrac{6}{7}$

4. (A) $\left(\dfrac{7}{5}\div\dfrac{7}{10}\times\dfrac{3}{4}\right)\div\dfrac{4}{9}-\left(\dfrac{7}{16}\div\dfrac{21}{2}\times\dfrac{36}{5}\right)\times\dfrac{5}{12}$

$\left(\dfrac{7}{5}\times\dfrac{40}{21}\right)\times\dfrac{9}{4}-\left(\dfrac{7}{16}\times\dfrac{2}{21}\times\dfrac{36}{5}\times\dfrac{5}{12}\right)$

$= 6 - \dfrac{1}{8}$

$= \dfrac{47}{8}$

5. (A) $5 \div 10$ of $10 \times 4 + 4 \div 4$ of $4 \times 10 - (10 - 4) \div 16 \times 4$

$5 \div 10 \times 10 \times 4 + 4 \div 4 \times 4 \times 10 - 6 \div 16 \times 4$

$5 \div 100 + 4 \div 16 \times 10 - 6 \times \dfrac{1}{16} \times 4$

$\dfrac{5\times4}{100}+\dfrac{4\times10}{16}-\dfrac{3}{2}$

$\dfrac{1}{5}+\dfrac{5}{2}-\dfrac{3}{2}$

$\Rightarrow \dfrac{1}{5}+1 = \dfrac{6}{5}$

$= 1.2$

6. (B) $3 \times 6 \div 4$ of $6 - 6 \div 2 \times (4 - 6) + 4 - 2 \times 3 \div 6$ of $\dfrac{1}{3}$

$3 \times 6 \div 4 \times 6 \div 2 \times (-2) + 4 - 2 \times 3 \div 6 \times \dfrac{1}{3}$

$\dfrac{3\times6}{24}+3\times2+4-\dfrac{2\times3}{2}$

$\dfrac{3}{4} + 6 + 4 - 3$

$\dfrac{3}{4} + 7 = 7\dfrac{3}{4}$

7. (A)

8. (B) $15 \times 8 + 6 + \left[\dfrac{24}{6}+4\right]$

$= 120 + 6 + [8]$

$= 134$

9. (A) $\dfrac{\left(\dfrac{16}{5}-\dfrac{3}{5}\right)\div\dfrac{8}{5}}{\dfrac{8}{7}\div\left[\dfrac{6}{7}-\dfrac{5}{7}\right]}=\dfrac{\dfrac{13}{5}\times\dfrac{5}{8}}{\dfrac{8}{7}\times7}$

$= \dfrac{\dfrac{13}{8}}{8}=\dfrac{13}{64}$

10. (D) $\dfrac{\dfrac{19}{5}\times\dfrac{5}{8}}{\dfrac{8}{7}\div\left[\dfrac{6}{7}-\dfrac{5}{7}\right]}=\dfrac{\dfrac{19}{8}}{8} = \dfrac{19}{64}$

11. (A) $\dfrac{\left(\dfrac{16}{5}+\dfrac{3}{5}\right)\times\dfrac{5}{8}}{\dfrac{8}{7}\times\dfrac{7}{8}}=\dfrac{19}{8}$

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12. (C) $\frac{\left[\frac{19}{5}\times\frac{5}{8}\right]}{\frac{9}{8}\times 1}=\frac{\left(\frac{19}{8}\right)}{\left(\frac{9}{8}\right)}=\frac{19}{9}$

13. (D)

14. (D) $\frac{46-\frac{3}{4}\times 32-6}{11+\frac{3}{4}\times 28}$

$= \frac{46-24-6}{11+21}=\frac{16}{32}=\frac{1}{2}$

15. (C) $\frac{46+24-6}{11+21}=\frac{64}{32}=\frac{4}{2}$

$= 2$

16. (B)

17. (A)

18. (C) $\left[\frac{6}{5}\times\left\{\frac{3}{7}-\left(\frac{19}{15}-\frac{13}{15}\right)\times\frac{5}{7}\right\}\right]\div\left(\frac{6}{7}\times\frac{1}{5}\right)$

$\left[\frac{6}{5}\times\left\{\frac{3}{7}-\frac{6}{15}\times\frac{5}{7}\right\}\right]\times\frac{35}{6}$

$\frac{6}{5}\times\left\{\frac{3}{7}-\frac{2}{7}\right\}\times\frac{35}{6}$

$\frac{6}{5}\times\frac{1}{7}\times\frac{35}{6} = 1$

19. (D) $\frac{1}{2}\times\frac{8}{5}\div\left\{\frac{11}{5}-\left(\frac{5}{16}+\frac{3}{5}\times\frac{15}{8}\times\frac{3}{2}\right)\right\}$

$\frac{4}{5}\div\left\{\frac{11}{5}-\left(\frac{5}{16}+\frac{27}{16}\right)\right\}$

$\frac{4}{5}\div\left\{\frac{11}{5}-2\right\} = \frac{4}{5}\times\frac{5}{1}$

20. (D) $x = \frac{+1}{12}-\frac{1}{24}=\frac{+1}{24}$

$y = \frac{+1}{36}-\frac{1}{72}=\frac{+1}{72}$

$\frac{x}{y}=\frac{\left(\frac{1}{24}\right)}{\left(\frac{1}{72}\right)} = 3$

21. (A) $\frac{14040\times 10^{-6}}{24^2+6^2-24\times 6}$

$= \frac{\left(24^3+6^3\right)\times 10^{-6}}{24^2+6^2-24\times 6}$

$= (24 + 6) \times 10^{-6} = 3\times 10^{-5}$

22. (B) $\frac{1}{2}\times\frac{8}{5}\div\left\{\frac{11}{5}-\left(\frac{5}{16}+\frac{3}{5}\times\frac{15}{8}\times\frac{3}{2}\right)\right\}$

$\frac{4}{5}\div\left\{\frac{11}{5}-\left(\frac{5}{16}+\frac{27}{16}\right)\right\}$

$= \frac{4}{5}\div\left\{\frac{11}{5}-2\right\} = \frac{4}{5}\div\frac{1}{5} = \frac{4}{5}\times\frac{5}{1} = 4$

23. (C) $10 - 2.43 \times 10^{-2} = 1.417 \times 7 + 7x$

$\Rightarrow x = 0.0081$

24. (C) $\left\{\frac{5}{4}\times\left(\frac{7}{3}\times\frac{5}{7}\right)-\frac{17}{12}\right\}+\frac{1}{9}\times\frac{3}{7}+\frac{2}{7}+\frac{1}{6}$

$\left\{\frac{25}{12}\times-\frac{17}{12}\right\}+\frac{1}{21}+\frac{2}{7}+\frac{1}{6}$

$= \frac{2}{3}+\frac{1}{21}+\frac{2}{7}+\frac{1}{6} = \frac{21}{21}+\frac{1}{6} = \frac{7}{6}$

25. (B) Using formula of $a^2 - b^2 = (a - b)(a + b)$

$\frac{(18.43)^2-(6.57)^2}{11.86}=\frac{25\times 11.86}{11.86} = 25$

26. (D) $(1.25)(1 - 6.4 \times 10^{-5}) = 1.2496 + a$

$\Rightarrow a = 0.00032$

27. (B) $\frac{2}{3}\div\left\{\frac{3}{7}\times\frac{14}{5}\times\frac{5}{3}-\frac{4}{3}\right\}$

$\frac{2}{3}\div\left\{2-\frac{4}{3}\right\}$

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

28.(A) Using BODMAS Rule

$20 - [2.8 \times 5 \div 0.7 - 3 \div 0.9 \times 1.5 + 2]$

$= 20 - \left[\frac{2.8\times 5\times 10}{7}-\frac{3\times 10}{9}\times 1.5+2\right]$

$= 20 - [20 - 5 + 2]$

$= 3$

Simplification (CHSL — 2017)

1. Find the value of $\sqrt[3]{\frac{4913}{2197}}$

$\sqrt[3]{\frac{4913}{2197}}$ का मान ज्ञात कीजिए ?

(A) 17/13 (B) 13/17
(C) 13/7 (D) 17/7

2. What is the value of $\frac{\sqrt{96}+\sqrt{216}}{\sqrt{24}}$?

$\frac{\sqrt{96}+\sqrt{216}}{\sqrt{24}}$ का मान क्या है ?

(A) 8 (B) 4
(C) 5 (D) 10

3. Simplify: $(13)^2 - (14)^2 + (17)^2 - 250 = \sqrt{?}$

सरल कीजिए: $(13)^2 - (14)^2 + (17)^2 - 250 = \sqrt{?}$

(A) 196 (B) 169
(C) 121 (D) 144

4. If $3\sqrt{2} + \sqrt{18} + \sqrt{50} = 15.55$, then what is the value of $\sqrt{32} + \sqrt{72}$?

यदि $3\sqrt{2} + \sqrt{18} + \sqrt{50} = 15.55$ है, तो $\sqrt{32} + \sqrt{72}$ का मान क्या है ?

(A) 13.22 (B) 10.83
(C) 14.13 (D) 16.54

5. What is the simplified value of

$$\frac{1}{\sqrt{25}-\sqrt{24}} - \frac{1}{\sqrt{24}-\sqrt{23}} + \frac{1}{\sqrt{23}-\sqrt{22}} - \frac{1}{\sqrt{22}-\sqrt{21}} + \frac{1}{\sqrt{21}-\sqrt{20}}?$$

$$\frac{1}{\sqrt{25}-\sqrt{24}} - \frac{1}{\sqrt{24}-\sqrt{23}} + \frac{1}{\sqrt{23}-\sqrt{22}} - \frac{1}{\sqrt{22}-\sqrt{21}} + \frac{1}{\sqrt{21}-\sqrt{20}}?$$ का सरलीकृत मान क्या है ?

(A) $5+2\sqrt{5}$ (B) $5-5\sqrt{2}$
(C) $\sqrt{25}+\sqrt{21}$ (D) $\sqrt{25}-4$

6. What is the simplified value of

$$\frac{1}{\sqrt{17}-\sqrt{13}} - \frac{1}{\sqrt{16}-\sqrt{15}} + \frac{1}{\sqrt{15}-\sqrt{14}} - \frac{1}{\sqrt{14}-\sqrt{13}} + \frac{1}{\sqrt{13}-\sqrt{12}}?$$

$$\frac{1}{\sqrt{17}-\sqrt{13}} - \frac{1}{\sqrt{16}-\sqrt{15}} + \frac{1}{\sqrt{15}-\sqrt{14}} - \frac{1}{\sqrt{14}-\sqrt{13}} + \frac{1}{\sqrt{13}-\sqrt{12}}$$ का सरलीकृत मान क्या है ?

(A) $4-2\sqrt{3}$ (B) $\sqrt{17}-3\sqrt{2}$
(C) $\sqrt{17}+\sqrt{12}$ (D) $4+2\sqrt{3}$

7. Find the unit place digit in $71 \times 72 \times 73 \times 74 \times 76 \times 77 \times 78 \times 79$.

$71 \times 72 \times 73 \times 74 \times 76 \times 77 \times 78 \times 79$ में इकाई स्थान अंक ढूंढें ?

(A) 2 (B) 0
(C) 4 (D) 6

8. The value of $1 + 2^2 + 2^3 + 2^4 + ... + 2^9$ is ____.

$1 + 2^2 + 2^3 + 2^4 + ... + 2^8$ का मान _____ है ?

(A) 255 (B) 511
(C) 1021 (D) 2047

9. Which of the following statement(s) is/are TRUE?

निम्नलिखित में से कौन-सा/से कथन सत्य है/हैं ?

I. $\sqrt[3]{512} \times \sqrt{256} > \sqrt[3]{343} \times \sqrt{289}$

II. $\sqrt{121} + \sqrt[3]{1331} > \sqrt[3]{125} \times \sqrt{125}$

(A) Only I / केवल I
(B) Only II / केवल II
(C) Neither I nor II / न तो I न ही II
(D) Both I and II / I तथा II दोनों

10. Find the value of $\frac{6\sqrt{2}}{5\sqrt{3}}\left(\sqrt{2}+\sqrt{18}\right)$

$\frac{6\sqrt{2}}{5\sqrt{3}}\left(\sqrt{2}+\sqrt{18}\right)$ का मान ज्ञात करें ?

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(A) $\frac{16\sqrt{3}}{5}$ (B) $\frac{26\sqrt{3}}{5}$

(C) $\frac{36\sqrt{3}}{5}$ (D) $\frac{46\sqrt{3}}{5}$

11. What is the value of $\sqrt[3]{729} \times \sqrt{16} + \sqrt{676} + \sqrt{169}$?

$\sqrt[3]{729} \times \sqrt{16} + \sqrt{676} + \sqrt{169}$ का मान क्या है ?

(A) 75 (B) 64

(C) 35 (D) 60

12. Find the sum of 0.00005 + 0.88885 + 0.77775 + 0.66665 + 0.55555.

0.00005 + 0.88885 + 0.77775 + 0.66665 + 0.55555 का योग ज्ञात करें ?

(A) 3.88885 (B) 2.88875

(C) 3.6875 (D) 2.9875

13. Which of the following statement(s) is/are TRUE?

निम्नलिखित में से कौनसा/से कथन सत्य है/हैं ?

I. $\sqrt{324} + \sqrt{3.24} + \sqrt{0.0324} = 19.98$

II. $\sqrt{129 + \sqrt{121} + \sqrt{361} + \sqrt{100}} = 13$

(A) Only I / केवल I

(B) Only II / केवल II

(C) Neither I nor II / न तो I न ही II

(D) Both I and II / I तथा II दोनों

14. What is the simplified value of $2\sqrt[3]{243} + 3\sqrt[3]{9} - \sqrt[3]{1125}$?

$2\sqrt[3]{243} + 3\sqrt[3]{9} - \sqrt[3]{1125}$ का सरलीकृत का मान क्या है ?

(A) $5\sqrt[3]{9}$ (B) $4\sqrt[3]{9}$

(C) $7\sqrt[3]{9}$ (D) $11\sqrt[3]{9}$

15. Calculate the value of $\frac{\sqrt{5}}{(5-\sqrt{5})}$, if $\sqrt{5}$ = 2.236.

$\frac{\sqrt{5}}{(5-\sqrt{5})}$ का मान ज्ञात कीजिए, यदि $\sqrt{5}$ = 2.236 है।

(A) 0.809 (B) 0.89

(C) 0.089 (D) 0.807

16. If x = 1.1, then what is the value of $\sqrt{4x^2 - 4x + 1}$?

यदि $x = 1.1$ है, तो $\sqrt{4x^2 - 4x + 1}$ का मान क्या है ?

(A) 1.21 (B) 1.331

(C) 2.21 (D) 1.2

17. If $\frac{1}{3.197} = 0.3127$, find the value of $\frac{1}{0.0003197}$

यदि $\frac{1}{3.197} = 0.3127$, तो $\frac{1}{0.0003197}$ का मान ज्ञात करें ?

(A) 3127 (B) 3197

(C) 312.7 (D) 0.3127

18. If $9^x = \sqrt[11]{243}$, then what is the value of x?

यदि $9^x = \sqrt[11]{243}$ है, तो x का मान क्या है ?

(A) 5/11 (B) 5/22

(C) 5/7 (D) 5/33

19. Find the greatest number among $(2)^{\frac{1}{3}}$, $(3)^{\frac{1}{2}}$, 1, $(5)^{\frac{1}{6}}$

$(2)^{\frac{1}{3}}$, $(3)^{\frac{1}{2}}$, 1, $(5)^{\frac{1}{6}}$ में से सबसे बड़ी संख्या ज्ञात करें ?

(A) $(2)^{\frac{1}{3}}$ (B) $(3)^{\frac{1}{2}}$

(C) 1 (D) $(5)^{\frac{1}{6}}$

20. What is the value of $\frac{\sqrt[3]{64} \times \sqrt{121}}{\sqrt{289} - \sqrt{169}}$?

$\frac{\sqrt[3]{64} \times \sqrt{121}}{\sqrt{289} - \sqrt{169}}$ का मान क्या है ?

(A) 12 (B) 11

(C) 1/11 (D) 1/12

21. Find the leat number among $\frac{5}{9}$, $\sqrt{\frac{9}{49}}$, 0.43 and $(0.7)^2$

$\frac{5}{9}$, $\sqrt{\frac{9}{49}}$, 0.43 और $(0.7)^2$ में सबसे छोटी संख्या ज्ञात करें।

(A) $\frac{5}{9}$ (B) $(0.7)^2$

(C) $\sqrt{\frac{9}{49}}$ (D) 0.43

22. If $3\sqrt{7} + \sqrt{343} = 19.21$, then find the value of $\sqrt{252} + 20\sqrt{7}$

यदि $3\sqrt{7} + \sqrt{343} = 19.21$ है, तो $\sqrt{252} + 20\sqrt{7}$ का मान ज्ञात करें ?

(A) 39.4 (B) 49.9
(C) 56.8 (D) 92.3

23. If $\sqrt{20} + \sqrt{125} = 15.65$, then what is the value of $\sqrt{45} + \sqrt{5}$?

यदि $\sqrt{20} + \sqrt{125} = 15.65$ है, तो $\sqrt{45} + \sqrt{5}$ का मान क्या है ?

(A) 6.98 (B) 8.94
(C) 9.98 (D) 11.27

24. Represent the 0.000256 in vulgar fraction.

0.000256 को सामान्य अपूर्णांक में बदलिए।

(A) $\frac{4}{15625}$ (B) $\frac{2}{15625}$
(C) $\frac{16}{15625}$ (D) $\frac{8}{15625}$

25. Assum 57 + 59 + 109 = 0, then find the value of $57^3 + 59^3 + 109^3$

कल्पना कीजिए कि 57 + 59 + 109 = 0 है, तो $57^3 + 59^3 + 109^3$ का मान क्या होगा ?

(A) 1099701 (B) 1099601
(C) 1099801 (D) 1098701

26. What value of 'p' will satisfy the equation $\frac{p}{\sqrt{540}} = \frac{\sqrt{240}}{p}$?

p का कौनसा मान $\frac{p}{\sqrt{540}} = \frac{\sqrt{240}}{p}$ समीकरण को संतुष्ट करेगा ?

(A) 6 (B) 10
(C) $6\sqrt{10}$ (D) $\sqrt{10}$

27. What is the simplified value of $\sqrt[3]{3125} + 4\sqrt[3]{25} + 3\sqrt[3]{675}$?

$\sqrt[3]{3125} + 4\sqrt[3]{25} + 3\sqrt[3]{675}$ का सरलीकृत मान क्या है ?

(A) $18\sqrt[3]{25}$ (B) $5\sqrt[3]{25}$
(C) $9\sqrt{125}$ (D) $\sqrt[3]{125}$

28. If $\frac{1}{2.315} = 0.4319$ find the value of $\frac{1}{0.0002315}$.

यदि $\frac{1}{2.315} = 0.4319$, तो $\frac{1}{0.0002315}$ का मान ज्ञात करें।

(A) 4319 (B) 2315
(C) 431.9 (D) 231.5

29. What is the value of 'x' in $2\sqrt{3x} - 5\sqrt{27x} + \sqrt{108x} = -21$?

$2\sqrt{3x} - 5\sqrt{27x} + \sqrt{108x} = -21$? में 'x' का मान क्या है ?

(A) 0.33 (B) 1
(C) 3 (D) 9

30. What is the simplified form of $\sqrt{\frac{64}{288}}$?

$\sqrt{\frac{64}{288}}$ का सरलीकृत रूप क्या है ?

(A) $\frac{\sqrt{2}}{3}$ (B) $\frac{1}{2}$ (C) $\frac{2}{\sqrt{3}}$ (D) $\frac{3}{\sqrt{3}}$

31. Simplify (157 × 157 + 143 × 143)

सरल करिए : (157 × 157 + 143 × 143)

(A) 45098 (B) 46098
(C) 90196 (D) 91196

32. If x = 0.139, then what is the value of $\sqrt{4x^2 + 4x + 1}$?

यदि x = 0.139 है, तो $\sqrt{4x^2 + 4x + 1}$? का मान क्या है ?

(A) 1.39 (B) 1.278
(C) 2.139 (D) 1.69

33. Find the value of $\left\{(216)^{\frac{2}{3}} + (36)^{-\frac{1}{2}}\right\}$

$\left\{(216)^{\frac{2}{3}} + (36)^{-\frac{1}{2}}\right\}$ का मान ज्ञात करें।

(A) $\frac{216}{6}$ (B) $\frac{218}{6}$
(C) $\frac{215}{6}$ (D) $\frac{217}{6}$

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34. If $p=\sqrt{72-\sqrt{72-\sqrt{72-\sqrt{72-.....\infty}}}}$ then find the value of $2p^2 + 1$.

यदि $p=\sqrt{72-\sqrt{72-\sqrt{72-\sqrt{72-.....\infty}}}}$ है, तो $2p^2+1$ का मान ज्ञात करें।

(A) –129 (B) –163
(C) 129 (D) 163

35. If $4^x = \sqrt[7]{1024}$, then what is the value of x?

यदि $4^x = \sqrt[7]{1024}$, है, तो x का मान क्या है ?

(A) $\frac{5}{7}$ (B) $\frac{4}{7}$ (C) $\frac{3}{7}$ (D) $\frac{6}{7}$

36. Find the value of $\left[7\left(64^{\frac{1}{3}}+27^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}}$

$\left[7\left(64^{\frac{1}{3}}+27^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}}$ का मान ज्ञात करें।

(A) 7 (B) 6
(C) 49 (D) 343

37. Which of the following number is largest among all?
निम्न में से सबसे बड़ी संख्या कौनसी है ?

$0.7, 0.\overline{7}, 0.0\overline{7}, 0.\overline{07}$

(A) $0.\overline{07}$ (B) $0.0\overline{7}$
(C) 0.7 (D) $0.\overline{7}$

38. What is the value of $\sqrt[3]{512}+\sqrt{169}+\sqrt[3]{216}+\sqrt{225}$?

$\sqrt[3]{512}+\sqrt{169}+\sqrt[3]{216}+\sqrt{225}$ का मान क्या है ?

(A) 48 (B) 32
(C) 42 (D) 36

39. Calculate the value of x if $\sqrt{1-(x/289)}$ = (15/17).

x का मान ज्ञात कीजिए यदि $\sqrt{1-(x/289)}$ =(15/17) है।

(A) 64 (B) 44
(C) 36 (D) 54

40. Which of the following value of 'x' satisfies the equation $4^{x-1}.9^{2x-6} = 5184$?
'x' के निम्न मान में से कौनसा समीकरण $4^{x-1}.9^{2x-6} = 5184$ को संतुष्ट करता है ?

(A) 2 (B) 3
(C) 4 (D) 6

41. Arrange the fractions $\frac{3}{4}, \frac{5}{12}, \frac{13}{16}, \frac{16}{29}, \frac{3}{8}$ in their descending order of magnitude.

$\frac{3}{4}, \frac{5}{12}, \frac{13}{16}, \frac{16}{29}, \frac{3}{8}$ परिमाण के अनुसार अवरोही क्रम में भिन्न को व्यवस्थित करें।

(A) $\frac{3}{4}>\frac{3}{8}>\frac{13}{16}>\frac{16}{29}>\frac{5}{12}$

(B) $\frac{3}{8}>\frac{5}{12}>\frac{16}{29}>\frac{3}{4}>\frac{13}{16}$

(C) $\frac{13}{16}>\frac{3}{4}>\frac{16}{29}>\frac{5}{12}>\frac{3}{8}$

(D) $\frac{13}{16}>\frac{16}{29}>\frac{3}{4}>\frac{5}{12}>\frac{3}{8}$

42. Which of the following statement(s) is/are CORRECT?
निम्नलिखित में से कौन-सा/से कथन सही है/हैं ?

I. $\left(\sqrt{11}+\sqrt{2}\right)>\left(\sqrt{8}+\sqrt{5}\right)$

II. $\left(\sqrt{10}+\sqrt{3}\right)>\left(\sqrt{7}+\sqrt{6}\right)$

(A) Only I / केवल I
(B) Only II / केवल II
(C) Neither I nor II / न तो I न ही II
(D) Both I and II / I तथा II दोनों

43. What is the positive square root of $\left[25+4\sqrt{39}\right]$?

$\left[25+4\sqrt{39}\right]$ का धनात्मक वर्गमूल क्या है ?

(A) $\sqrt{13}+2\sqrt{3}$ (B) $\sqrt{13}+3\sqrt{2}$
(C) $\sqrt{11}+2\sqrt{3}$ (D) $11+3\sqrt{2}$

44. Find the approximate valueof '?' in: $(14.998)^3$ = ?
$(14.998)^3$ = ? में '?' का अनुमानित मान ज्ञात करें ?

(A) 3573 (B) 4096
(C) 3378 (D) 3374

45. What is the square root of $\frac{\sqrt{5}+2}{\sqrt{5}-2}$?

$\frac{\sqrt{5}+2}{\sqrt{5}-2}$ का वर्गमूल क्या है ?

(A) $\sqrt{5}-\sqrt{4}$ (B) $\sqrt{5}+2$

(C) $5+\sqrt{2}$ (D) 7

46. If $\frac{256}{0.256}=\frac{25.6}{x}$ then what willbe the value of x?

यदि $\frac{256}{0.256}=\frac{25.6}{x}$ है, तो x का मान क्या होगा ?

(A) 2.56 (B) 25.6

(C) 0.256 (D) 0.0256

47. What is the value of $\left[\left(\sqrt{529}\right)+\left(\sqrt{5.29}\right)+\left(\sqrt{0.0529}\right)\right]$?

$\left[\left(\sqrt{529}\right)+\left(\sqrt{5.29}\right)+\left(\sqrt{0.0529}\right)\right]$ का मान क्या है ?

(A) 25.323 (B) 25.53

(C) 23.253 (D) 23.53

48. Find the remainder in the expression $\frac{557\times653\times672}{9}$

समीकरण $\frac{557\times653\times672}{9}$ का शेष ज्ञात कीजिए।

(A) 0 (B) 3

(C) 5 (D) 6

49. Calculate the value of x, if $\sqrt{1-\left(\frac{x}{529}\right)}=\left(\frac{16}{23}\right)$

x का मान ज्ञात कीजिए, यदि $\sqrt{1-\left(\frac{x}{529}\right)}=\left(\frac{16}{23}\right)$ है ?

(A) 283 (B) 276

(C) 273 (D) 374

50. Which of the following statement(s) is/are TRUE?

निम्नलिखित में से कौन-सा/से कथन सत्य है/हैं ?

I. $\sqrt{676}+\sqrt{6.76}+\sqrt{0.0676}=27.76$

II. $\sqrt{339+\sqrt{36}+\sqrt{49}+\sqrt{81}}=19$

(A) Only I / केवल I

(B) Only II / केवल II

(C) Neither I nor II / न तो I न ही II

(D) Both I and II / I तथा II दोनों

51. Which of the following relation is CORRECT?

I. $\left(\sqrt{15}+\sqrt{7}\right)<\left(2\sqrt{22}\right)$

II. $\left(\sqrt{17}+\sqrt{5}\right)<\left(\sqrt{20}+\sqrt{2}\right)$

(A) Only I / केवल I

(B) Only II / केवल II

(C) Neither I nor II / न तो I न ही II

(D) Both I and II / I तथा II दोनों

52. Find the cube root of 287496.

287696 का घन मूल ज्ञात कीजिए।

(A) 64 (B) 46

(C) 56 (D) 66

53. Arrange the following in descending order.

$\sqrt[4]{5}, \sqrt[3]{4}$ and $\sqrt[4]{6}$

$\sqrt[4]{5}, \sqrt[3]{4}$ और $\sqrt[4]{6}$ को घटते क्रम में क्रमबद्ध करें।

(A) $\sqrt[4]{6}>\sqrt[3]{4}>\sqrt[4]{5}$ (B) $\sqrt[4]{6}>\sqrt[4]{5}>\sqrt[3]{4}$

(C) $\sqrt[3]{4}>\sqrt[4]{5}>\sqrt[4]{6}$ (D) $\sqrt[3]{4}>\sqrt[4]{6}>\sqrt[4]{5}$

54. If $\sqrt{21}=4.58$, then what is the simplified value of $\left(8\sqrt{\frac{3}{7}}-3\sqrt{\frac{7}{3}}\right)$

यदि $\sqrt{21}=4.58$ है, तो $\left(8\sqrt{\frac{3}{7}}-3\sqrt{\frac{7}{3}}\right)$ का सरलीकृत मान क्या है ?

(A) 0.474 (B) 0.752

(C) 0.655 (D) 1

55. If $\sqrt{3}=1.732$, then what is the value of $\left(\sqrt{3}-\frac{10}{\sqrt{3}}+\sqrt{27}\right)$

यदि $\sqrt{3}=1.732$ है, तो $\left(\sqrt{3}-\frac{10}{\sqrt{3}}+\sqrt{27}\right)$ का मान क्या है ?

(A) 1.154 (B) 1.577

(C) 1.464 (D) 2.358

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56. If $\frac{196}{0.196}=\frac{19.6}{x}$ then what will be the value of x?

यदि $\frac{196}{0.196}=\frac{19.6}{x}$ है, तो x का मान ज्ञात करें।

(A) 1.96 (B) 10.96
(C) 0.0196 (D) 0.196

57. $\frac{1}{33}$ of $\frac{1}{66}$ of $\frac{1}{3}$ of $\frac{1}{66}$ of 10000 of a number will be what percentage of that number?

एक संख्या के 10000 के $\frac{1}{66}$ के $\frac{1}{3}$ के $\frac{1}{66}$ के $\frac{1}{33}$ जो संख्या होगी वह इस संख्या के कितने प्रतिशत होगी ?

(A) 2.32 (B) 1.32
(C) 0.232 (D) 0.0232

58. What is the simplified value of $\frac{\sqrt{5}+\sqrt{4}}{\sqrt{5}-\sqrt{4}}+\frac{\sqrt{5}-\sqrt{4}}{\sqrt{5}+\sqrt{4}}$

$\frac{\sqrt{5}+\sqrt{4}}{\sqrt{5}-\sqrt{4}}+\frac{\sqrt{5}-\sqrt{4}}{\sqrt{5}+\sqrt{4}}$ का सरलीकृत मान क्या है ?

(A) 9 (B) 10
(C) 18 (D) 20

59. A zoo has few numbers of penguins and polar bears. The total number of heads of both of them is 60 and the total number of their feet is 160. How many polar bears are there in the zoo?

चिड़ियाघर में कुछ संख्या में पेंगुइन और ध्रुवीय भालू हैं। उन दोनों के सिर की कुल संख्या 60 है और पैर की कुल संख्या 160 है। चिड़ियाघर में कुल कितने ध्रुवीय भालू हैं ?

(A) 20 (B) 40
(C) 60 (D) 80

60. If $16^{2x+6} = 64$, then what is the value x'

यदि $16^{2x+6} = 64$ है, तो x' का मान ज्ञात करें।

(A) $-\frac{9}{4}$ (B) $\frac{9}{4}$ (C) $-\frac{18}{4}$ (D) $\frac{18}{4}$

61. Find the value of 'x', If $8^x \times 32^x = 2^{10}$

'x' का मान ज्ञात करें, यदि $8^x \times 32^x = 2^{10}$ है।

(A) $\frac{1}{8}$ (B) $\frac{10}{8}$ (C) $\frac{20}{8}$ (D) $\frac{30}{8}$

62. Calculate the value of $\left(5^{\frac{1}{4}}-1\right)\left(5^{\frac{3}{4}}+5^{\frac{1}{2}}+5^{\frac{1}{4}}+1\right)$

$\left(5^{\frac{1}{4}}-1\right)\left(5^{\frac{3}{4}}+5^{\frac{1}{2}}+5^{\frac{1}{4}}+1\right)$ का मान ज्ञात करें।

(A) 5 (B) 4
(C) 10 (D) 25

63 Find 'x' if $\sqrt{(2+7x)}=\sqrt{(3x+4)}$

'x' का मान ज्ञात करें, यदि $\sqrt{(2+7x)}=\sqrt{(3x+4)}$ है।

(A) 0.5 (B) 1
(C) 1.5 (D) 2

64. What is the positive square root of $\left[19+4\sqrt{21}\right]$?

$\left[19+4\sqrt{21}\right]$ का धनात्मक वर्गमूल क्या है ?

(A) $\sqrt{7}+2\sqrt{3}$ (B) $\sqrt{3}+2\sqrt{7}$
(C) $\sqrt{2}+3\sqrt{7}$ (D) $\sqrt{7}+3\sqrt{3}$

65. The value of $\left(0.175\overline{9}+0.30\overline{41}\right)$ is _____.

$\left(0.175\overline{9}+0.30\overline{41}\right)$ का मान _____ है।

(A) $0.480\overline{2}$ (B) $0.480\overline{14}$
(C) $0.470\overline{1}$ (D) $0.481\overline{1}$

66. What is the value of $\frac{\sqrt[4]{16}+\sqrt[4]{625}}{\sqrt[4]{256}}$?

$\frac{\sqrt[4]{16}+\sqrt[4]{625}}{\sqrt[4]{256}}$ का मान क्या है ?

(A) 1.75 (B) 1.25
(C) 1.6 (D) 1.5

67. Find the value of $n+\frac{3n}{2}+\frac{9n}{4}+.....\infty$

$n+\frac{3n}{2}+\frac{9n}{4}+.....\infty$ का मान ज्ञात कीजिए।

(A) 0 (B) 1
(C) 2 (D) Infinity / अनंत

68. If $x = \left[\frac{1}{\sqrt{5}+\sqrt{3}}\right]$, $y = \left[\frac{1}{\sqrt{7}+\sqrt{5}}\right]$ and $z = \left[\frac{1}{\sqrt{7}+\sqrt{3}}\right]$, then what is the value of (x + y + z)?

यदि $x = \left[\frac{1}{\sqrt{5}+\sqrt{3}}\right]$, $y = \left[\frac{1}{\sqrt{7}+\sqrt{5}}\right]$ तथा $z = \left[\frac{1}{\sqrt{7}+\sqrt{3}}\right]$ है, तो (x + y + z) का मान क्या है ?

(A) $\frac{3}{4}\left(\sqrt{7}-\sqrt{3}\right)$ (B) $\sqrt{5}-\sqrt{3}$

(C) $\sqrt{7}+\sqrt{5}$ (D) $\frac{1}{2\left(\sqrt{7}+\sqrt{3}\right)}$

69. $1+\frac{1}{2}+\frac{1}{4}+\frac{1}{16}+\frac{1}{32}+\frac{1}{64}$ is aproximately equal to _____.

$1+\frac{1}{2}+\frac{1}{4}+\frac{1}{16}+\frac{1}{32}+\frac{1}{64}$ लगभग _____ के बराबर है।

(A) 1.5 (B) 2
(C) 2.5 (D) 3

70. What is the square root of $\frac{3-2\sqrt{2}}{3+2\sqrt{2}}$?

$\frac{3-2\sqrt{2}}{3+2\sqrt{2}}$ का वर्गमूल क्या है ?

(A) $3-2\sqrt{2}$ (B) $3+2\sqrt{2}$
(C) 1 (D) 17

71. Calculate the value of $\frac{(59881\times59881-49681\times49681)}{10200}$

$\frac{(59881\times59881-49681\times49681)}{10200}$ का मान ज्ञात कीजिए।

(A) 110956
(B) 109562
(C) 109652
(D) 109662

72. What is the value of $\sqrt{1054+\sqrt{196}+\sqrt{169}+\sqrt{64}}$?

$\sqrt{1054+\sqrt{196}+\sqrt{169}+\sqrt{64}}$? का मान क्या है ?

(A) 33 (B) 37
(C) 29 (D) 31

73. A man engaged a servant on a condition that he would pay him ₹ 80 and a pair of jeans after service of one year. Servant served for only 9 months and receives a pair of jeans and an amount of ₹ 55. The price of the jeans is _____.

एक आदमी ने एक नौकर को एक शर्त पर रखा कि वह उसे ₹ 80 और एक जोड़ी जीन्स एक वर्ष की सेवा के बाद देगा। नौकर ने केवल 9 महीनों की सेवा दी और जींस की एक जोड़ी और ₹ 55 प्राप्त किया। जीन्स की कीमत _____ है।

(A) ₹ 80 (B) ₹ 60
(C) ₹ 40 (D) ₹ 20

74. Fraction that lies between $\frac{2}{5}$ and $\frac{4}{9}$ is _____

$\frac{2}{5}$ और $\frac{4}{9}$ के बीच _____ अपूर्णांक आता है।

(A) $\frac{3}{7}$ (B) $\frac{2}{4}$ (C) $\frac{4}{5}$ (D) $\frac{1}{2}$

75. Which of the following statement(s) is/are TRUE?

निम्नलिखित में से कौन-सा/से कथन सत्य है/हैं ?

I. $\frac{\sqrt{225}+\sqrt{441}}{\sqrt{256}} > 2.5$

II. $\frac{\sqrt{289}+\sqrt{529}}{\sqrt{169}} > 3$

(A) Only I / केवल I
(B) Only II / केवल II
(C) Neither I nor II / न तो I न ही II
(D) Both I and II / I तथा II दोनों

76. Find the unit place digit in $(82)^{102} + (183)^{103}$

$(82)^{102} + (183)^{103}$ के स्थानीय इकाई अंक का मान ज्ञात कीजिए।

(A) 1 (B) 6
(C) 8 (D) 9

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

$\sqrt{5\sqrt{5\sqrt{5\sqrt{5}}}}$ का मान ज्ञात कीजिए।

(A) $5^{\frac{1}{16}}$ (B) $5^{\frac{15}{32}}$ (C) $5^{\frac{15}{16}}$ (D) $5^{\frac{1}{32}}$

78. Arrange the following in the decreasing order?

$\left(\sqrt{23}-\sqrt{21}\right), \left(\sqrt{19}-\sqrt{17}\right), \left(\sqrt{21}-\sqrt{19}\right)$

निम्नलिखित को घटते क्रम में व्यवस्थित करें ?

$\left(\sqrt{23}-\sqrt{21}\right), \left(\sqrt{19}-\sqrt{17}\right), \left(\sqrt{21}-\sqrt{19}\right)$

(A) $\left(\sqrt{23}-\sqrt{21}\right) > \left(\sqrt{21}-\sqrt{19}\right) > \left(\sqrt{19}-\sqrt{17}\right)$

(B) $\left(\sqrt{23}-\sqrt{21}\right) > \left(\sqrt{19}-\sqrt{17}\right) > \left(\sqrt{21}-\sqrt{19}\right)$

(C) $\left(\sqrt{19}-\sqrt{17}\right) > \left(\sqrt{21}-\sqrt{19}\right) > \left(\sqrt{23}-\sqrt{21}\right)$

(D) $\left(\sqrt{21}-\sqrt{19}\right) > \left(\sqrt{23}-\sqrt{21}\right) > \left(\sqrt{19}-\sqrt{17}\right)$

79. Anuj runs $1\frac{2}{3}$ laps of 7 laps race, find the remaining laps to be run.

अनुज 7 चक्करों के दौड़ का $1\frac{2}{3}$ चक्कर दौड़ता है, तो दोड़ने के लिए बचे चक्करों का मान ज्ञात कीजिए।

(A) $\frac{16}{3}$ (B) $\frac{14}{3}$ (C) $\frac{11}{3}$ (D) $\frac{10}{3}$

80. If the value of $\sqrt{30}$ is approximately 5.477, then what is the approximate value of $\sqrt{\frac{5}{6}}$?

यदि $\sqrt{30}$ का निकटतम मान 5.477 है, तो $\sqrt{\frac{5}{6}}$ का निकटतम मान क्या है ?

(A) 0.853 (B) 0.891
(C) 0.913 (D) 0.937

81. Calculate $\frac{7|2-6|-4|5|\div 5}{-7(2)-2\times 2\div 2+2}$

गणना कीजिए: $\frac{7|2-6|-4|5|\div 5}{-7(2)-2\times 2\div 2+2}$

(A) $-\frac{16}{18}$ (B) $-\frac{14}{7}$

(C) $-\frac{12}{7}$ (D) $-\frac{12}{18}$

Solution

1.(A) $\sqrt[3]{\frac{4913}{2197}} = \frac{17}{13}$

2. (C) $\frac{\sqrt{96}+\sqrt{216}}{\sqrt{24}} = \frac{\sqrt[4]{6}+\sqrt[6]{6}}{\sqrt[2]{6}} = 5$

3. (D) $13^2 + (17)^2 - (14)^2 - 250 = \sqrt{x}$

$169 + (17 + 14)(17 - 14) - 250 = \sqrt{x}$

$169 + 3 \times 31 - 250 = \sqrt{x}$

$169 + 93 - 250 = \sqrt{x}$

$\Rightarrow \quad \sqrt{x} = 12$

$\Rightarrow \quad x = 144$

4. (C) $\sqrt{32} + \sqrt{72} = \sqrt[4]{2} + \sqrt[6]{2} = \sqrt[10]{2} = 14.13$

5. (A) $\sqrt{25} + \sqrt{24} - \sqrt{24} - \sqrt{23} + \sqrt{23} + \sqrt{22} - \sqrt{22} - \sqrt{21} + \sqrt{21} + \sqrt{20}$

$= \sqrt{25} + \sqrt{20} = 5 + \sqrt[2]{5}$

6. (C) $\sqrt{17} + \sqrt{16} - \sqrt{16} - \sqrt{15} + \sqrt{15} + \sqrt{14} - \sqrt{14} - \sqrt{13} + \sqrt{13} + \sqrt{12}$

$= \sqrt{17} + \sqrt{12}$

7. (D) $71 \times 72 \times 73 \times 74 \times 76 \times 77 \times 78 \times 79$
$= 6$

8. (C) $1 + \frac{2^2\left(2^8 - 1\right)}{2 - 1} = 1 + 4 \times 255 = 1021$

9. (A) I. $8 \times 16 = 128, \quad 7 \times 17 = 119$

II. $11 + 11 = 22, \quad 5 \times 5\sqrt{5} = 25\sqrt{5}$

10.(A) $\frac{6\sqrt{2}}{5\sqrt{3}}\left(\sqrt{2} + \sqrt{18}\right) = \frac{6\sqrt{2}}{5\sqrt{3}}\left(\sqrt{2} + 3\sqrt{2}\right) = \frac{16\sqrt{3}}{5}$

11.(A) $9 \times 4 + 26 + 13 = 75$

12.(A) $0.00005 + 0.88885 + 0.77775 + 0.66665 + 0.55555 = 3.8885$

13.(D) $18 + 1.8 + 0.18 = 19.98$

$\sqrt{129 + 11 + 19 + 10} = 13$

14.(B) $2 \times 3\sqrt[3]{9} + 3\sqrt[3]{9} - \sqrt[3]{1125}$

$= 6\sqrt[3]{9} + 3\sqrt[3]{9} - 5\sqrt[3]{9} = 4\sqrt[3]{9}$

15.(A) $\frac{\sqrt{5}}{5 - \sqrt{5}} = \frac{\sqrt{5}\left(5 + \sqrt{5}\right)}{20} = 0.809$

16.(D) $\sqrt{4x^2 - 4x + 1} = \sqrt{(2x - 1)^2} = 2x - 1$
$= 2 \times 1.1 - 1 = 1.2$

17.(A) $\frac{1}{3.197} = 0.3127, \quad \frac{1}{0.0003197} = 3127$

18.(B) $9^x = \sqrt[11]{243}$

$\Rightarrow \quad 9^{11x} = \sqrt{243}$

$\Rightarrow \quad 9^{11x} = \sqrt[9]{3} \qquad \Rightarrow \qquad x = \frac{5}{22}$

19.(B) $2^{\frac{1}{3}}, 3^{\frac{1}{2}}, 1, 5^{\frac{1}{6}}$

$\Rightarrow \quad 2^2, 3^2, 1^6, 5$

$\Rightarrow \quad 4, 9, 1, 5$

20.(B) $\frac{4 \times 11}{17 - 13} = 11$

21.(C) $\frac{5}{9}, \frac{3}{7}, 0.43, 0.49$

$\Rightarrow \quad \frac{3}{7}$

22.(D) $\sqrt{252} + \sqrt[20]{7} = \sqrt[6]{7} + \sqrt[20]{7}$
$= \sqrt[26]{7}$

given $\sqrt[3]{7} + 7 = 19.21$

$\sqrt{7} = 4.07$

Required answer

$\sqrt{252} + \sqrt[20]{7} = 49.9$

23.(B) $\sqrt{45} + \sqrt{5} = \sqrt[3]{5} + \sqrt{5} = \sqrt[4]{5} = 8.94$

24.(A) $0.000256 = \frac{4}{15625}$

25.(A) If $57 + 59 + 109 = 0$
then $57^3 + 59^3 + 109^3 = 3 \times 57 \times 59 \times 109$
$= 1099701$

26.(C) $\frac{P}{\sqrt{540}} = \frac{\sqrt{240}}{P}$

$\Rightarrow \quad P = \sqrt[6]{10}$

27.(A) $\sqrt[3]{3125} + 4\sqrt[3]{25} + 3\sqrt[3]{675}$

$= 5\sqrt[3]{25} + 4\sqrt[3]{25} + 3 \times 3\sqrt[3]{25}$

$= 18\sqrt[3]{25}$

28.(A) $\frac{1}{2.315} = 0.4319$, then $\frac{1}{0.0002315} = 4319$

29.(C) $2\sqrt{3x} - 5\sqrt{27x} + \sqrt{108x} = -21$

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$2\sqrt{3x} - 15\sqrt{3x} + 6\sqrt{3x} = -21$

$-7\sqrt{3x} = -21$

$\sqrt{3x} = 3$

$3x = 9$

$x = 3$

30.(A) $\sqrt{\frac{64}{288}} = \frac{8}{12\sqrt{2}} = \frac{\sqrt{2}}{3}$

31.(A) $[157 \times 157 + 143 \times 143] = 45098$

32.(B) $x = 0.139$

$\sqrt{4x^2 + 4x + 1} = 2x + 1 = 2 \times 0.139 + 1 = 1.278$

33.(D) $[216^{2/3} + 36^{-1/2}] = 36 + \frac{1}{6} = \frac{217}{6}$

34.(C) $P = \sqrt{72 - \sqrt{72 - \sqrt{72....\infty}}}$

$P = 8$

$\therefore 2P^2 + 1 = 2 \times 64 + 1 = 129$

35.(A) $4^x = \sqrt[7]{1024}$

$4^x = 2^{\frac{10}{7}} \quad \Rightarrow \quad 2^{2x} = 2^{\frac{10}{7}}$

$\Rightarrow 2x = \frac{10}{7} \quad \Rightarrow \quad x = \frac{5}{7}$

Required answer = 29 + 1 = 30

36.(A) $7\left[\left(64^{1/3} + 27^{1/3}\right)^3\right]^{1/4} = 7\left[(4+3)^3\right]^{1/4} = 7$

37.(D) $0.7,\ 0.\overline{7},\ 0.0\overline{7},\ 0.\overline{07}$

$0.7 = \frac{7}{10},\ 0.\overline{7} = \frac{7}{9},\ 0.0\overline{7} = \frac{7}{90},\ 0.\overline{07} = \frac{7}{99}$

38.(C) $\sqrt[3]{512} + \sqrt{169} + \sqrt[3]{216} + \sqrt{225}$

$= 8 + 13 + 6 + 15 = 42$

39.(A) $\sqrt{1 - \frac{x}{289}} = \frac{15}{17}$

$\Rightarrow 1 - \frac{x}{289} = \frac{225}{289}$

$\Rightarrow 289 - x = 225$

$\Rightarrow x = 224$

40.(C) $\frac{4^x}{4} \times \frac{9^{2x}}{96} = 5184$

$\Rightarrow 4^x \times 9^{2x} = 4^4 \times 9^8$

$\Rightarrow x = 4$

41.(C) $\frac{3}{4}, \frac{5}{12}, \frac{13}{16}, \frac{16}{29}, \frac{3}{8}$

$= \frac{13}{14} > \frac{3}{4} > \frac{16}{29} > \frac{5}{12} > \frac{7}{8}$

42.(C) $\left(\sqrt{11} + \sqrt{2}\right)^2 = 13 + 2\sqrt{22}$

$\left(\sqrt{8} + \sqrt{5}\right)^2 = 13 + 2\sqrt{40}$

$\left(\sqrt{10} + 3\right)^2 = 13 + 2\sqrt{30}$

$\left(\sqrt{7} + \sqrt{6}\right)^2 = 13 + 2\sqrt{42}$

43.(A) $25 + 4\sqrt{39} = 25 + 2\sqrt{156} = \left(\sqrt{13} + \sqrt{12}\right)^2$

$= \sqrt{13} + 2\sqrt{3}$

44.(D) $(14.998)^3 \simeq (15)^3 \simeq 3375$

45.(B) $\frac{\sqrt{5}+2}{\sqrt{5}-2} = \frac{\left(\sqrt{5}+2\right)\left(\sqrt{5}+2\right)}{1} = \left(\sqrt{5}+2\right)^2$

46.(D) $\frac{256}{0.256} = \frac{25.6}{x}$

$x = 0.0256$

47.(B) $\sqrt{529} + \sqrt{5.29} + \sqrt{0.0529} = 23 + 2.3 + 0.23$

$= 25.53$

48.(D) $\frac{557 \times 653 \times 672}{9} = \frac{8 \times 5 \times 6}{9} = 6(R)$

49.(C) $\sqrt{1 - \frac{x}{529}} = \frac{16}{23}$

$\Rightarrow 1 - \frac{x}{529} = \frac{256}{529}$

$\Rightarrow \frac{529 - x}{529} = \frac{256}{529}$

$\Rightarrow x = 273$

50.(B) $\sqrt{676} + \sqrt{6.76} + \sqrt{0.0676} = 26 + 2.6 + 0.26$

$= 28.32$

$\sqrt{339 + 6 + 7 + 9} = 19$

51. (I) $\left(\sqrt{15} + \sqrt{7}\right)^2 = 22 + 2\sqrt{105}$

$\left(\sqrt{17} + \sqrt{5}\right)^2 = 22 + 2\sqrt{65}$

$\left(\sqrt{20} + \sqrt{2}\right)^2 = 22 + 2\sqrt{40}$

52.(D) $3\sqrt{287696} = 66$

53.(D) $5^{\frac{1}{4}}, 4^{\frac{1}{3}}, 6^{\frac{1}{4}}$

$\Rightarrow 5^3, 4^4, 6^3$

$\Rightarrow 125, 256, 216$

54.(C) $\sqrt[8]{\frac{3}{7}} - \sqrt[3]{\frac{7}{3}} = \frac{8\times3-3\times7}{\sqrt{21}} = \frac{3}{\sqrt{21}} = 0.655$

55.(A) $\sqrt{3} = 1.732$

$$\sqrt{3} - \frac{10}{\sqrt{3}} + \sqrt{27} = \frac{3-10+3\sqrt{3}}{\sqrt{3}} = 1.154$$

56.(C) $\frac{196}{0.196} = \frac{19.6}{x}$

$\Rightarrow x = 0.0196$

57.(A) Let no. = x

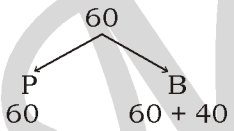
$$x \times 1000 \times \frac{1}{66} \times \frac{1}{3} \times \frac{1}{66} \times \frac{1}{33}$$

Required answer = 2.32

58.(C) $\frac{\sqrt{5}+\sqrt{4}}{\sqrt{5}-\sqrt{4}} + \frac{\sqrt{5}-\sqrt{4}}{\sqrt{5}+\sqrt{4}}$

$$\Rightarrow \frac{2(5+4)}{1} = 18$$

59.(A)



2 foot $\rightarrow$ 40

bolar bear = $\frac{40}{2} = 20$

60.(A) $16^{2x+6} = 64$

$\Rightarrow 4^{4x+12} = 4^3$

$\Rightarrow 4x = 12$

$\Rightarrow 4x = -9$

$$\Rightarrow x = -\frac{9}{4}$$

61.(*) $8^x \times 32^x = 2^{10}$

$\Rightarrow 2^{3x} \times 2^{5x} = 2^{10}$

$\Rightarrow 2^{8x} = 2^{10}$

$\Rightarrow 8x = 10$

$$\Rightarrow x = \frac{5}{4}$$

62.(B) $\left(5^{1/4}-1\right)\frac{\left(1\left(\left[5^{1/4}\right]-1\right)\right)}{5^{1/4}-1} = 4$

63.(A) $\sqrt{2+7x} = \sqrt{3x+4}$

$2 + 7x = 3x + 4$

$\Rightarrow x = 0.5$

64.(A) $19 + 4\sqrt{21} = 19 + 2\sqrt{84} = \left(\sqrt{12}+\sqrt{7}\right)^2$

$= \sqrt{7} + 2\sqrt{3}$

65.(B) $0.175\overline{9} + 0.30\overline{41}$

0.17599999

$+ 0.30414141$

0.48014140

$= 0.480\overline{14}$

66.(A) $\frac{\sqrt[4]{16}+\sqrt[4]{625}}{\sqrt[4]{256}} = \frac{2+5}{4} = \frac{7}{4} = 1.75$

67.(D) $x + \frac{3x}{2} + \frac{9x}{4} + \text{--------} \infty$

$$S_\infty = \frac{a}{1-r} = \frac{n}{1-\frac{3n}{2}} = \infty$$

68.(A) $x + y + z = \frac{1}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{7}+\sqrt{5}} + \frac{1}{\sqrt{7}+\sqrt{3}}$

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

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

$$= \frac{3}{4}\left(\sqrt{7}-\sqrt{3}\right)$$

69.(B) $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{16} + \frac{1}{32} + \frac{1}{64}$

$$S_n = \frac{1\left(1-\left(\frac{1}{2}\right)^6\right)}{1-\frac{1}{2}} \simeq 2$$

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

71.(B) $\frac{(59881+49681)(59881-49681)}{10200} = 109562$

72.(A) $\sqrt{1054+14+13+8} = \sqrt{1089} = 33$

73.(D) Let jeans price = ₹ x

given $\left[\frac{x+80}{12}\right] \times 9 = x + 55$

$\Rightarrow$ $x = ₹\ 20$

74.(A) $\frac{2}{5}, \frac{3}{7}, \frac{4}{9}$

75.(B) I. $\frac{\sqrt{225}+\sqrt{441}}{\sqrt{256}} = \frac{15+21}{16} = \frac{36}{19} = \frac{9}{4} = 2.25$

II. $\frac{\sqrt{289}+\sqrt{529}}{\sqrt{169}} = \frac{17+23}{13} = \frac{40}{13} = 3.7$

76.(A) $(82)^{102} + (83)^{103} = 2^2 + 3^3 = 1$

77.(C) $\sqrt{5\sqrt{5\sqrt{5\sqrt{5}}}} = 5^{\frac{15}{16}}$

78.(C) $\sqrt{23}-\sqrt{21}$, $\sqrt{19}-\sqrt{17}$, $\sqrt{21}-\sqrt{19}$

$\frac{1}{\sqrt{23}-\sqrt{21}}, \frac{1}{\sqrt{19}-\sqrt{17}}, \frac{1}{\sqrt{21}-\sqrt{19}}$

$\Rightarrow \frac{\sqrt{23}+\sqrt{21}}{2}, \frac{\sqrt{19}+\sqrt{17}}{2}, \frac{\sqrt{21}+\sqrt{19}}{2}$

79.(A) Required answer = $7 - \frac{5}{3} = \frac{16}{3}$

80.(C) $\sqrt{\frac{5}{6}} = \frac{\sqrt{30}}{6} = \frac{5.477}{6} = 0.913$

81.(C) $\frac{7\times4-20\div5}{-14-2\times1+2} = -\frac{12}{7}$

Simplification (CGL_Pre — 2021)

1. Find the value of the following expression :
निम्नांकित व्यंजक का मान ज्ञात कीजिए :
$372 \div 56 \times 7 - 5 + 2$

(A) $43\frac{1}{2}$ (B) $2\frac{93}{98}$

(C) $-2\frac{95}{98}$ (D) 58

2. Find the value of the following expression
$980 \div 35 \times 16 + 4 - 2 \times 2$.
निम्नांकित व्यंजक का मान ज्ञात कीजिए।

(A) 556 (B) $15/2$

(C) 448 (D) $7/4$

3. Simplify the following expression :
निम्नलिखित व्यंजक का मान ज्ञात कीजिए।

$$\frac{3\frac{1}{2}+5\frac{1}{3}\div 1\frac{1}{3}\times 5\frac{1}{4}-5\frac{1}{2}}{1\frac{1}{2}\times 1\frac{2}{3}-6\frac{1}{2}}\div 7\times 2$$

(A) $29\frac{9}{32}$ (B) $\frac{13}{147}$

(C) $-\frac{5}{128}$ (D) $-1\frac{5}{14}$

4. Find the value of $70^3 + 20^3 - 90^3$.
$70^3 + 20^3 - 90^3$ का मान ज्ञात कीजिए–
(A) –300000 (B) –378000
(C) 0 (D) 378000

5. Find the value of the following expression :
निम्नलिखित व्यंजक का मान ज्ञात कीजिए–

$$\frac{5-35\div 5\times 15+5}{12-2}$$

(A) –9.5 (B) –2.5
(C) 11.5 (D) –13.5

6. The value of $40 \div 5$ of $2 \times [18 \div 6 \times (12 - 9)$ of $5 - (3 - 8)] \div 25$ is :
$40 \div 5$ of $2 \times [18 \div 6 \times (12 - 9)$ of $5 - (3 - 8)] \div 25$ का मान ज्ञात कीजिए।
(A) 7 (B) 8
(C) 5 (D) 4

7. The value of

$$\frac{2}{7}-\frac{3}{8}-\left[2\frac{1}{4}\div 3\frac{1}{2}\text{ of }1\frac{1}{3}+\left\{1\frac{17}{40}-\left(3-1\frac{1}{5}-\frac{3}{8}\right)\right\}\right]$$

is :
का मान ज्ञात कीजिए।

(A) $-4/7$ (B) $4/7$

(C) $2/7$ (D) $-2/7$

8. Find the value of $(1.6)^3 - (0.9)^3 - (0.7)^3$.
$(1.6)^3 - (0.9)^3 - (0.7)^3$ का मान ज्ञात कीजिए।
(A) 3.24 (B) –3.24
(C) 3.024 (D) –3.024

9. What is the value of p, if $25(3 + 4p) \div 12$ of $5 - 3 \times 8 = 6$?
यदि $25(3 + 4p) \div 12$ of $5 - 3 \times 8 = 6$ है, तो p का मान क्या है ?

(A) $17\frac{1}{4}$ (B) 69

(C) 72 (D) $15\frac{1}{3}$

10. The value of $\frac{46+\frac{3}{4}\text{of }32-6}{37-\frac{3}{4}\text{of}(34+6)}$ is :

$\frac{46+\frac{3}{4}\text{of }32-6}{37-\frac{3}{4}\text{of}(34+6)}$ का मान क्या है ?

(A) $34/7$ (B) $44/7$

(C) $54/7$ (D) $64/7$

11. The value of $15 + 6.3 \div 7 - 3 \times 1.3 - 2$ is :
$15 + 6.3 \div 7 - 3 \times 1.3 - 2$ का मान कितना होगा ?
(A) 7 (B) –10
(C) 9 (D) 10

12. Find the value of the following exression :
निम्नलिखित व्यंजक का मान ज्ञात कीजिए:

$$\frac{3\div 1\times 2+5-2}{3\times 3-2}$$

(A) $9/7$ (B) $4/3$

(C) $4/7$ (D) $19/3$

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13. The value of $\dfrac{\left[\frac{3}{8}-\left\{\frac{3}{8}-\left(\frac{5}{8}-\frac{3}{8}\right)\right\}\right]\text{of}\,4.8-0.9}{4\frac{1}{6}\div 2.5\times 0.2\div\frac{1}{5}\text{of}\,50+\left(\frac{3}{4}-\frac{1}{8}\right)}$

is :

$\dfrac{\left[\frac{3}{8}-\left\{\frac{3}{8}-\left(\frac{5}{8}-\frac{3}{8}\right)\right\}\right]\text{of}\,4.8-0.9}{4\frac{1}{6}\div 2.5\times 0.2\div\frac{1}{5}\text{of}\,50+\left(\frac{3}{4}-\frac{1}{8}\right)}$ का मान है-

(A) $\frac{30}{79}$ (B) $\frac{42}{79}$

(C) $\frac{36}{79}$ (D) $\frac{24}{79}$

14. What is the simplified value of the following?
निम्नलिखित का सरलीकृत मान क्या है ?

$$\frac{9\div\frac{3}{7}\text{of}\left(9+6\times\overline{4-2}\right)+\left[\frac{1}{5}\div\frac{7}{25}-\left\{\frac{5}{8}+\frac{6}{16}\right\}\right]}{24\div\overline{16-10}+36\div(5+20\div 4-1)}$$

(A) $\frac{40}{7}$ (B) $\frac{5}{56}$

(C) $\frac{7}{40}$ (D) $\frac{51}{56}$

15. Find the value of the following expression :
निम्नलिखित व्यंजक का मान ज्ञात कीजिए:

$$\frac{1\frac{2}{3}\div\frac{5}{6}\times 6+\frac{4}{5}\times\frac{1}{2}+\frac{2}{3}}{2-\left[1\frac{1}{3}\times\left(-\frac{3}{5}\right)-6\left\{\frac{3}{5}-\left(3-\frac{3}{10}\right)\right\}\right]}$$

(A) $-\frac{4}{3}$ (B) $\frac{4}{3}$

(C) $\frac{1}{7}$ (D) $-\frac{1}{7}$

16. The value of :/ का मान ज्ञात करें।

$$\left[25+8\div 2-\left\{16+(14\text{of}\,7\div 14)-\left(18\div 12\text{of}\,\frac{1}{2}\right)\right\}\right]$$

(A) 12 (B) 6
(C) 9 (D) 3

17. The value of/ का मान कितना होगा ?

$25\div 10-\left(\frac{7}{4}\times\frac{1}{3}\right)\text{of}\,\frac{6}{5}+\frac{14}{3}\times\frac{9}{10}+\left(\frac{1}{5}\div\frac{1}{25}\right)$ is:

(A) 11 (B) 7
(C) 15 (D) 9

18. Find the value of the following expresion:
निम्नांकित व्यंजक का मान ज्ञात कीजिए:

$$\frac{4\frac{1}{3}+3\frac{1}{3}\times 1\frac{4}{5}\div 3\frac{3}{4}\times\left(6\frac{1}{4}\text{of}\,1\frac{1}{15}\right)}{\frac{2}{3}\div\frac{5}{6}\times\frac{2}{3}}$$

(A) $28\frac{1}{8}$ (B) $\frac{1}{8}$

(C) $289\frac{3}{8}$ (D) $12\frac{1}{2}$

19. Find the value of the following expression :
निम्नलिखित व्यंजक का मान ज्ञात कीजिए:

$$\frac{(7.03)^3-0.027}{(7.03)^2+2.109+(0.3)^2}$$

(A) 7.06 (B) 7
(C) 7.33 (D) 6.73

20. Simplify

$\left[\left(5\frac{1}{4}\div 3\frac{1}{2}\times\frac{5}{12}\right)-\frac{3}{16}\right]\div\left(3\frac{4}{7}\div\frac{5}{14}\text{of}\,6\frac{2}{3}\right)$ of $1\frac{1}{3}$

का मान ज्ञात कीजिए।

(A) $\frac{5}{32}$ (B) $\frac{17}{32}$

(C) $\frac{3}{32}$ (D) $\frac{7}{32}$

21. Find the value of the following expression:
निम्नलिखित व्यंजक का मान ज्ञात कीजिए:
$-5 + 5 + 625 \div 5 \times 5$

(A) 25 (B) 625
(C) 605 (D) 121

Solution

1. (A) $= 372 \times \frac{1}{56} \times 7 - 5 + 2$

$= \frac{372}{8} - 3 = \frac{372-24}{8} = 43\frac{1}{2}$

2. (C) $980 \times \frac{1}{35} \times 16 + 4 - 2 \times 2$

$= \frac{196}{7} \times 16 = 28 \times 16 = 448$

3. (D) $\frac{\frac{7}{2} + \frac{16}{3} \times \frac{3}{4} \times \frac{21}{4} - \frac{11}{2}}{\frac{3}{2} \times \frac{5}{3} - \frac{13}{2}} \times \frac{1}{7} \times 2$

$\Rightarrow \frac{21-2}{-14} = -1\frac{5}{14}$

4. (B) $70^3 + 20^3 - 90^3$
$(70 + 20)^3$
$70^3+20^3-70^3-20^3-3\times70\times20\times90$
-378000

5. (A) $\frac{5 - 35 \div 5 \times 15 + 5}{12.5}$

$\Rightarrow \frac{-105+10}{10} \Rightarrow \frac{-95}{10} \Rightarrow -9.5$

6. (B) $40 \div 10 \times (45+5) \div 25$
$4 \times 50 \div 25 = 8$

7. (A) $\left[\frac{2}{7} - \frac{3}{8} - \left\{\frac{9}{4} \div \frac{14}{3} + \left(\frac{57}{40} - \frac{57}{40}\right)\right\}\right]$

$= \frac{-5}{56} - \frac{27}{56} = \frac{-32}{56} = \frac{-4}{7}$

8. (C) $(1.6)^3 - ((0.9)^3+(0.7)^3) \Rightarrow (0.9+0.7)^3 - ((0.9)^3+(0.7)^3)$
$(a + b)^3 - (a^3 + b^3) \Rightarrow 3ab(a + b)$
$\Rightarrow 3(0.9)(0.7)(1.6) \Rightarrow 3(0.63)(1.6) \Rightarrow (1.89)(1.6)$
$\Rightarrow 3.024$

9. (A) $75 + 100P \div 60 - 24 = 6$

$\Rightarrow \frac{75+100P}{60} = 30$

$\Rightarrow 75 + 100P = 1800$
$\Rightarrow 100P = 1725$
$\Rightarrow P = 17.25$

10. (D) $\frac{46 + \frac{3}{4} \times 32 - 6}{37 - \frac{3}{4} \times 40} = \frac{64}{7}$

11. (D) $15 + 6.3 \div 7 - 3 \times 1.3 - 2$
$15.9 - 5.9$
10

12. (A) $\frac{3 \div 1 \times 2 + 5 - 2}{3 \times 3 - 2} = \frac{9}{7}$

13. (C) $\frac{0.3}{\frac{5}{3} \times 0.02 + \frac{5}{8}} \Rightarrow \frac{3}{\frac{1}{3} + \frac{50}{8}} \Rightarrow \frac{3 \times 24}{158} = \frac{36}{79}$

14. (B) $\frac{9 \div \frac{3}{7} \text{ of } (9 + 6 \times 2) + \left[\frac{1}{5} \times \frac{25}{7} - (1)\right]}{24 \div 6 + 36 \div 9}$

$\frac{9 \div \frac{3}{7} \text{ of } 21 + \frac{5}{7} - \frac{7}{7}}{4 + 4}$

$\Rightarrow \frac{9 \div 9 - \frac{2}{7}}{8} \Rightarrow \frac{1 - \frac{2}{7}}{8} \Rightarrow \frac{\frac{5}{7}}{8} \Rightarrow \frac{5}{56}$

15. (A) $\frac{\frac{5}{3} \times \frac{6}{5} \times 6 + \frac{2}{5} + \frac{2}{3}}{2 - \left[\frac{4}{3} \times \left(-\frac{3}{5}\right) - 6\left\{\frac{3}{5} - \frac{27}{10}\right\}\right]}$

$= \frac{12 + \frac{16}{15}}{2 - \left[-\frac{4}{5} - \frac{18}{5} + \frac{81}{5}\right]} = \frac{12 + \frac{16}{75}}{2 - \frac{59}{5}}$

$= \frac{60 + \frac{16}{3}}{10 - 59} = \frac{196}{3 \times (-49)} = \frac{28}{-3 \times 7} = -\frac{4}{3}$

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16. (C) $\left[25+\frac{8}{2}-\left\{16+\left(\frac{14\times7}{14}\right)-\left(18\times\frac{1}{6}\right)\right\}\right]$

$= [29 - \{(23) - (3)\}]$

$= [29 - 23 + 3] = 9$

17. (A) $\frac{25}{10}-\left(\frac{7}{12}\right)\times\frac{6}{5}+\frac{21}{5}+\frac{1}{5}\times25$

$= \frac{5}{2}-\frac{7}{10}+\frac{21}{5}+5$

$= \frac{25-7+42+50}{10} = \frac{25+35+50}{10} = \frac{110}{10}$

$= 11$

18. (A) $\frac{\frac{13}{5}+\frac{10}{3}\times\frac{9}{5}\times\frac{4}{15}\times\frac{20}{3}}{\frac{2}{3}\times\frac{6}{5}\times\frac{2}{3}}$

$\Rightarrow \frac{\frac{13}{3}+\frac{8}{5}\times\frac{20}{3}}{\frac{8}{15}} \Rightarrow \frac{\frac{32}{3}+\frac{13}{3}}{\frac{8}{15}}$

$\Rightarrow \frac{\frac{45}{3}}{\frac{8}{15}} \Rightarrow \frac{15\times15}{8} \Rightarrow \frac{225}{8} \Rightarrow 28\frac{1}{8}$

19. (D) $\frac{(7.03)^3-(.3)^3}{(7.03)^3+(7.03)(.3)+(.3)^2}$

$\Rightarrow \frac{(7.03)^2+(.3)^2+(-7.03)(.3)}{(7.03)^2+(.3)^2+(7.03)(.3)}$

$\Rightarrow (7.03–03) \Rightarrow 6.73$

20. (D) $\left(\left(\frac{21}{4}\div\frac{7}{2}\times\frac{5}{12}\right)-\frac{3}{16}\right)\div\left(\frac{25}{7}\div\frac{5}{14}\text{ of }\frac{20}{3}\right)\text{ of }\frac{4}{3}$

$\Rightarrow \left(\left(\frac{21}{4}\times\frac{2}{7}\times\frac{5}{12}\right)-\frac{3}{16}\right)\div\left(\frac{25}{7}\div\frac{100}{42}\right)\text{of}\frac{4}{3}$

$\Rightarrow \left(\left(\frac{5}{8}-\frac{3}{16}\right)\right)\div\left(\frac{25}{7}\times\frac{42}{100}\right)\text{ of }\frac{4}{3}$

$\Rightarrow \left(\frac{7}{16}\right)\div\left(\frac{6}{4}\right)\text{ of }\frac{4}{3}$

$\Rightarrow \frac{7}{16}\div2 \Rightarrow \frac{7}{16}\times\frac{1}{2} \Rightarrow \frac{7}{32}$

21. (B) $-5 + 5 + 125 \times 5 = 625$

Simplification (CGL_Pre — 2020)

1 The value of $\frac{52-1170\div 26+13\times 2}{2+1\frac{1}{8}\text{ of }2-1\frac{1}{4}}$ is :

$\frac{52-1170\div 26+13\times 2}{2+1\frac{1}{8}\text{ of }2-1\frac{1}{4}}$ का मान ज्ञात करें।

(A) 12 (B) 11
(C) 27 (D) 41

2. The value of $3\frac{5}{6}+\left[3\frac{2}{3}+\left\{\frac{15}{4}\left(5\frac{4}{5}\div 14\frac{1}{2}\right)\right\}\right]$ is equal to :

$3\frac{5}{6}+\left[3\frac{2}{3}+\left\{\frac{15}{4}\left(5\frac{4}{5}\div 14\frac{1}{2}\right)\right\}\right]$ का मान ज्ञात करें।

(A) 9 (B) 6
(C) 7 (D) 8

3. The value of $25\div 15\text{ of }4\times[4\div 5\times(9-7)]-(20\div 5\text{ of }9)$ is :
$25\div 15\text{ of }4\times[4\div 5\times(9-7)]-(20\div 5\text{ of }9)$ का मान ज्ञात करें।

(A) $\frac{2}{9}$ (B) $\frac{2}{3}$
(C) $\frac{4}{9}$ (D) $\frac{1}{3}$

4. The value of $32\div 12\text{ of }3\times[5-(15-12)\div 9]\text{ of }\frac{3}{7}+4-8\div 2\text{ of }4$ is :

$32\div 12\text{ of }3\times[5-(15-12)\div 9]\text{ of }\frac{3}{7}+4-8\div 2\text{ of }4$ का मान ज्ञात करो —

(A) $3\frac{1}{6}$ (B) $3\frac{1}{3}$
(C) $4\frac{7}{9}$ (D) $1\frac{7}{9}$

5. $5\frac{1}{5}\div\left[3\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{3}{5}+\frac{1}{10}-\frac{4}{15}\right)\right\}\right]$ is equal to :

$5\frac{1}{5}\div\left[3\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{3}{5}+\frac{1}{10}-\frac{4}{15}\right)\right\}\right]$ के बराबर है :

(A) $\frac{12}{31}$ (B) $\frac{22}{31}$
(C) $\frac{72}{31}$ (D) $\frac{52}{31}$

6. Simplify the following expression.
$\left(\frac{7}{16}\div\frac{1}{2}\text{of}\frac{1}{5}\right)\times\frac{4}{5}-\frac{1}{3}\times\frac{5}{8}\div\frac{1}{2}+\frac{3}{4}$
निम्न व्यंजक का मान ज्ञात करें।
$\left(\frac{7}{16}\div\frac{1}{2}\text{of}\frac{1}{5}\right)\times\frac{4}{5}-\frac{1}{3}\times\frac{5}{8}\div\frac{1}{2}+\frac{3}{4}$

(A) $\frac{23}{6}$ (B) $\frac{71}{150}$
(C) $\frac{317}{96}$ (D) $\frac{10}{3}$

7. The value of $18\div[26-\{25-(15-5)\div 2\}]\text{ of }12+2-2\div 4\times 16$ is :
$18\div[26-\{25-(15-5)\div 2\}]\text{ of }12+2-2\div 4\times 16$ का मान ज्ञात करें।

(A) $\frac{9}{4}$ (B) $-\frac{23}{4}$
(C) $\frac{3}{2}$ (D) $-\frac{25}{2}$

8. Simplify the following expression./निम्न व्यंजक का मान ज्ञात करें।
$\frac{(375+125)^2-(125-375)^2}{375\times 375-125\times 125}$ -

(A) $\frac{3}{2}$ (B) $\frac{27}{28}$
(C) $\frac{15}{8}$ (D) $\frac{3}{4}$

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9. Simplify the following expression/निम्न व्यंजक का मान ज्ञात करें।
$6 \div 4$ of $3 - 4 \div 6 \times (13 - 10) - 2 \times 15 \div 6 \times 6$

(A) $-29\frac{14}{17}$ **(B)** $-31\frac{1}{2}$

(C) $-27\frac{1}{2}$ (D) $-19\frac{1}{2}$

10. Simplify the following expression :/ निम्न व्यंजक का मान ज्ञात करें।
$3 \times 8 \div 9$ of $6 - 2 \div 3 \times (5 - 2) \times 2 + 18 \div 3$ of 3

(A) $-1\frac{5}{9}$ (B) -4

(C) $2\frac{12}{13}$ (D) $2\frac{1}{3}$

11. Simplify the following expression/ निम्न व्यंजक का मान ज्ञात करें।
$15 \div 3$ of $2 \times 4 + 9 \div 18$ of $2 \times 3 - 4 \div 8 \times 2$

(A) $12\frac{3}{4}$ (B) $9\frac{3}{4}$

(C) $42\frac{3}{4}$ (D) $39\frac{3}{4}$

12. Simplify the following expression : / निम्न व्यंजक का मान ज्ञात करें।
$8 \div 4$ of $2 - 15 \div 2$ of $5 - 6 \div 5 \times (-7 + 5)$ of 2

(A) $31\frac{7}{10}$ (B) $4\frac{3}{10}$

(C) $-\frac{1}{5}$ (D) $7\frac{3}{10}$

13. Simplify the following expression
निम्न व्यंजक का मान ज्ञात कीजिए-
$7 \times 4 \div 21$ of $4 - 5 \div 4 \times (9 - 13) + 2 - 2 \div 8$

(A) $7\frac{1}{12}$ (B) $5\frac{1}{16}$

(C) $5\frac{1}{3}$ (D) $12\frac{1}{2}$

14. The value of / का मान ज्ञात करें।

$$423 \div \left[270 \div \frac{3}{7} \times 35 + \left(17 \div \frac{1}{3}\right) - \left(8\frac{1}{2} - \frac{5}{2}\right)\right] \text{ is:}$$

(A) $\frac{43}{2455}$ (B) $\frac{47}{2455}$

(C) $\frac{51}{2455}$ (D) $\frac{41}{2455}$

15. The value of $54 \div 16$ of $3 \times [12 \div 4$of$\{6 \times 3 \div (11 - 2)\}] \div (12 \div 8 \times 2)$ is:
$54 \div 16$ of $3 \times [12 \div 4$of$\{6 \times 3 \div (11-2)\}] \div (12 \div 8 \times 2)$ का मान ज्ञात करें।

(A) $\frac{9}{8}$ (B) $\frac{3}{8}$

(C) $\frac{3}{4}$ (D) $\frac{9}{16}$

16. The value of

$$3\frac{1}{5} \div 4\frac{1}{2} \text{of} 5\frac{1}{3} - \frac{1}{8} \div \frac{1}{2} \text{of} \frac{1}{4} + \frac{1}{4}\left(\frac{1}{2} \div \frac{1}{8} \times \frac{1}{4}\right) \text{ is:}$$

का मान ज्ञात करें।

(A) $\frac{17}{60}$ (B) $-\frac{17}{60}$

(C) $-\frac{37}{60}$ (D) $\frac{37}{60}$

17. Simplify the following expression :
निम्न व्यंजक का मान ज्ञात करें।

$$\frac{7}{12} \div \frac{1}{10} \text{of} \frac{2}{3} - \frac{5}{3} \times \frac{9}{10} + \frac{5}{8} \div \frac{3}{4} \text{of} \frac{2}{3}$$

(A) –4 (B) $3\frac{23}{36}$

(C) $7\frac{29}{36}$ (D) $8\frac{1}{2}$

18. Simplify the following expression :
निम्न व्यंजक का मान ज्ञात करें।

$$\left(\frac{3}{4} - \frac{1}{4} \div \frac{1}{4} \text{of} \frac{2}{5}\right) \div \left(\frac{3}{4} \div \frac{2}{3} \text{of} \frac{3}{5}\right)$$

(A) $\frac{32}{75}$ (B) $-\frac{14}{15}$ (C) $-\frac{70}{27}$ (D) $\frac{14}{75}$

Solution

1. (B)

$$\frac{52-1170\div 26+13\times 2}{2+1\frac{1}{8}\text{ of }2-1\frac{1}{4}}$$

$$=\frac{52-\frac{1170}{26}+26}{2+\frac{9}{8}-\frac{5}{4}}=\frac{78-45}{3}=\frac{33}{3}=11$$

2. (A) By BODMAS rule =

$$\frac{23}{6}+\left[\frac{11}{3}+\left\{\frac{15}{4}\left(\frac{29}{5}\times\frac{2}{29}\right)\right\}\right]$$

$$=\frac{23}{6}+\left[\frac{11}{3}+\frac{3}{2}\right]=\frac{23}{6}+\frac{31}{6}=\frac{54}{6}=9$$

3. (A) By BODMAS Rule

$$\frac{25}{15\times 4}\times\left[\frac{4}{5}\times 2\right]-\left(\frac{20}{45}\right)$$

$$\frac{5}{12}\times\frac{8}{5}-\frac{4}{9}=\frac{2}{9}$$

4. (C) $32\div 12\text{ of }3\times[5-(15-12)\div 9]\text{ of }\frac{3}{7}+4-8\div 2\text{ of }4$

$$=\frac{32}{36}\times\left[5-\frac{3}{9}\right]\times\frac{3}{7}+4-\frac{8}{8}$$

$$=\frac{8}{9}\times\frac{42}{9}\times\frac{3}{7}+3$$

$$=\frac{16}{9}+3=1\frac{7}{9}+3=4\frac{7}{9}$$

5. (D) $5\frac{1}{5}\div\left[3\frac{1}{2}-\left\{\frac{5}{6}-\left(\frac{3}{5}+\frac{1}{10}-\frac{4}{15}\right)\right\}\right]$

$$=\frac{26}{5}\div\left[\frac{7}{2}-\left\{\frac{5}{6}-\frac{13}{30}\right\}\right]$$

$$=\frac{26}{5}\div\left[\frac{7}{2}-\frac{12}{30}\right]$$

$$=\frac{26}{5}\times\left[\frac{30}{93}\right]=\frac{52}{31}$$

6.(A) $\left(\frac{7}{16}\div\frac{1}{2}\text{of}\frac{1}{5}\right)\times\frac{4}{5}-\frac{1}{3}\times\frac{5}{8}\div\frac{1}{2}+\frac{3}{4}$

$$\Rightarrow\left(\frac{7}{16}\div\frac{1}{10}\right)\times\frac{4}{5}-\frac{1}{3}\times\frac{5}{8}+\frac{3}{4}$$

$$\Rightarrow\frac{70}{16}\times\frac{4}{5}-\frac{5}{12}+\frac{3}{4}$$

$$\Rightarrow\frac{7}{2}-\frac{5}{12}+\frac{3}{4}$$

$$\Rightarrow\frac{42-5+9}{12}=\frac{46}{12}=\frac{23}{6}$$

7.(B) By BODMAS rule

$$=18\div\left[26-\left(25-\frac{10}{2}\right)\right]\times 12+2-\frac{2}{4}\times 16$$

$$=\frac{18}{6\times 12}-6=-\frac{23}{4}$$

8.(A) $a = 375 + 125 = 500$
$b = 375 - 125 = 250$

$$\frac{a^2-b^2}{(375)^2-(125)^2}=(a-b)(a+b)=a^2-b^2$$

$$\frac{(500-250)(500+250)}{(375-125)(375+125)}=\frac{250\times 750}{250\times 500}=\frac{3}{2}$$

9.(B) By BODMAS rule

$$\frac{6}{12}-\frac{4}{6}\times 3-\frac{30}{6}\times 6$$

$$=\frac{1}{2}-2-30=-31\frac{1}{2}$$

10. (A) $3\times 8\div 9\text{ of }6-2\div 3\times(5-2)\times 2+18\div 3\text{ of }3$

$$\Rightarrow 3\times 8\div 54-\frac{2}{3}\times 3\times 2+18\div 9$$

$$\Rightarrow\frac{3\times 8}{54}-4+2=\frac{4}{9}-2$$

$$\Rightarrow-\frac{14}{9}=-1\frac{5}{9}$$

11. (B) $15\div 3\text{ of }2\times 4+9\div 18\text{ of }2\times 3-4\div 8\times 2$

$$\Rightarrow 15\div 6\times 4+9\div 36\times 3-\frac{1}{2}\times 2$$

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$\Rightarrow \frac{15}{6} \times 4 + \frac{9}{36} \times 3 - 1$

$\Rightarrow 10 + \frac{3}{4} - 1 = 9\frac{3}{4}$

12. (B) $8 \div 4 \text{ of } 2 - 15 \div 2 \text{ of } 5 - 6 \div 5 \times (-7 + 5) \text{ of } 2$

$8 \div 8 - 15 \div 10 - \frac{6}{5} \times (-2 \times 2)$

$= 1 - \frac{3}{2} + \frac{6}{5} \times 4$

$1 - \frac{3}{2} + \frac{24}{5} = \frac{10 - 15 + 48}{10} \quad \frac{43}{10}$

13. (A) $7 \times 4 \div 21 \text{ of } 4 - 5 \div 4 \times (9-13) + 2 - 2 \div 8$

$= 7 \times 4 \div 84 - \frac{5}{4} \times (-4) + 2 - \frac{2}{8}$

$= \frac{7 \times 4}{84} + \frac{5}{4} \times 4 + \frac{7}{4}$

$= \frac{1}{3} + 5 + \frac{7}{4} = \frac{4 + 60 + 21}{12} = \frac{85}{12} = 7\frac{1}{12}$

14. (B) By BODMAS rule

$423 \div \left[270 \times \frac{7}{3} \times 35 + (17 \times 3) - (6)\right]$

$= 423 \div [90 \times 7 \times 35 + 51 - 6]$

$= 423 \div [22050 + 45]$

$= \frac{423}{22095} = \frac{47}{2455}$

15.(D) By BODMAS rule

$\Rightarrow \frac{54}{48} \times [12 \div 4 \text{ of } (6 \times 3 \div 9)] \div \left(\frac{12}{8} \times 2\right)$

$\Rightarrow \frac{9}{8} \times [12 \div 4 \text{ of } 2] \times \frac{1}{3}$

$\Rightarrow \frac{9}{8} \times \frac{12}{8} \times \frac{1}{3} = \frac{9}{16}$

16.(C) By BODMAS rule

$\Rightarrow \frac{16}{5} \div \frac{9}{2} \text{ of } \frac{16}{3} - \frac{1}{8} \div \frac{1}{2} \text{ of } \frac{1}{4} + \frac{1}{4}\left(4 \times \frac{1}{4}\right)$

$\Rightarrow \frac{16}{5} \times \frac{6}{9 \times 16} - \frac{1}{8} \times 8 + \frac{1}{4} \times 1$

$\Rightarrow \frac{2}{15} - 1 + \frac{1}{4} = \frac{-37}{60}$

17.(D) By BODMAS rule

$\Rightarrow \frac{7}{12} \div \frac{1}{10} \text{ of } \frac{2}{3} - \frac{5}{3} \times \frac{9}{10} + \frac{5}{8} \div \frac{3}{4} \text{ of } \frac{2}{3}$

$\Rightarrow \frac{7}{12} \times \frac{30}{2} - \frac{45}{30} + \frac{5}{8} \times \frac{12}{6}$

$\Rightarrow \frac{35}{4} - \frac{3}{2} + \frac{5}{4} = \frac{34}{4} = \frac{17}{2} = 8\frac{1}{2}$

18.(B) By BODMAS rule

$= \left(\frac{3}{4} - \frac{1}{4} \times \frac{20}{2}\right) \div \left(\frac{3}{4} \times \frac{15}{6}\right)$

$= \left(\frac{3}{4} - \frac{5}{2}\right) \div \left(\frac{15}{8}\right) = -\frac{7}{4} \times \frac{8}{15} = -\frac{14}{15}$

Simplification (CGL_Pre — 2019)

1. If '+' means '–','–' means '+', '×' means '÷' and '÷' means '×', then the value of

$\frac{42-12\times3+8\div2+15}{8\times2-4+9\div3}$

यदि '+' का अर्थ '–','–' का अर्थ '+','×' का अर्थ '÷' और '÷' का अर्थ '×' होता हो, तो समीकरण $\frac{42-12\times3+8\div2+15}{8\times2-4+9\div3}$ का मान _____ होगा।

(A) $-\frac{5}{3}$ (B) $\frac{15}{19}$

(C) $-\frac{15}{19}$ (D) $\frac{5}{3}$

2. The value of $\left(18\div2\text{ of }\frac{1}{4}\right)\times\left(\frac{2}{3}\div\frac{3}{4}\times\frac{5}{8}\right)\div\left(\frac{2}{3}\div\frac{3}{4}\text{of}\frac{3}{4}\right)$ is :

$\left(18\div2\text{ of }\frac{1}{4}\right)\times\left(\frac{2}{3}\div\frac{3}{4}\times\frac{5}{8}\right)\div\left(\frac{2}{3}\div\frac{3}{4}\text{of}\frac{3}{4}\right)$ का मान बताइए ।

(A) $8\frac{5}{8}$ (B) $16\frac{7}{8}$

(C) $2\frac{7}{64}$ (D) $10\frac{2}{3}$

3. The value of $-\frac{5}{2}+\frac{3}{2}\div6\times\frac{1}{2}$ is equal to :

$-\frac{5}{2}+\frac{3}{2}\div6\times\frac{1}{2}$ का मान ज्ञात कीजिए।

(A) $-\frac{19}{8}$ (B) $-\frac{9}{8}$

(C) $-\frac{1}{3}$ (D) $-\frac{1}{12}$

4. Find the value of —/मान ज्ञात कीजिए —

$\frac{36\div42\text{of}6\times7+24\times6\div18+3\div(2-6)-(4+3\times2)\div8}{21\div3\text{of}7}$

(A) $7\frac{1}{2}$ (B) $\frac{1}{7}$

(C) $8\frac{1}{2}$ (D) 7

5. The value of $\frac{7-\left[4\times3(2-2\times2+5)-8\right]\div5}{2\div2\text{of}(4+4\div4\text{of}4)}$ is :

$\frac{7-\left[4\times3(2-2\times2+5)-8\right]\div5}{2\div2\text{of}(4+4\div4\text{of}4)}$ का मान ज्ञात कीजिए।

(A) 26 (B) $25\frac{1}{2}$

(C) $8\frac{1}{2}$ (D) 24

6. On Simplification $\frac{x^3-y^3}{x\left[(x+y)^2-3xy\right]}\div\frac{y\left[(x-y)^2+3xy\right]}{x^3+y^3}\times\frac{(x+y)^2-(x-y)^2}{x^2-y^2}$ is equal to :

$\frac{x^3-y^3}{x\left[(x+y)^2-3xy\right]}\div\frac{y\left[(x-y)^2+3xy\right]}{x^3+y^3}\times\frac{(x+y)^2-(x-y)^2}{x^2-y^2}$ का मान ज्ञात कीजिए।

(A) 4 (B) 1

(C) $\frac{1}{2}$ (D) $\frac{1}{4}$

7. If P = $\frac{x^4-8x}{x^2-x^2-2x}$, Q = $\frac{x^2+2x+1}{x^2-4x-5}$ and R = $\frac{2x^2+4x+8}{x-5}$, then (P × Q) ÷ R is equal to :

यदि P = $\frac{x^4-8x}{x^2-x^2-2x}$, Q = $\frac{x^2+2x+1}{x^2-4x-5}$ और R = $\frac{2x^2+4x+8}{x-5}$ हो, तो (P × Q) ÷ R का मान ज्ञात कीजिए।

(A) $\frac{1}{2}$ (B) 1

(C) 2 (D) 4

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8. The value of $\dfrac{5\frac{1}{2}\div 3\frac{2}{3}\text{ of }\frac{1}{4}+\left(5\frac{1}{9}-7\frac{7}{8}\div 9\frac{9}{20}\right)\times\frac{9}{11}}{5\div 5\text{ of }\frac{1}{10}-10\times 10\div 20}$

is:

$\dfrac{5\frac{1}{2}\div 3\frac{2}{3}\text{ of }\frac{1}{4}+\left(5\frac{1}{9}-7\frac{7}{8}\div 9\frac{9}{20}\right)\times\frac{9}{11}}{5\div 5\text{ of }\frac{1}{10}-10\times 10\div 20}$ का मान बताएँ

(A) $1\frac{4}{5}$ (B) $1\frac{9}{10}$

(C) $3\frac{4}{5}$ (D) $9\frac{1}{2}$

9. The value of / का मान ज्ञात कीजिये।

$\dfrac{8\div[(8-3)\div\{(4\div 4\text{ of }8)+4-4\times 4\div 8\}-2]}{8\times 8\div 4-8\div 8\text{ of }2-7}$ is :

(A) $\frac{17}{8}$ (B) $\frac{8}{3}$

(C) $\frac{16}{170}$ (D) $\frac{2}{17}$

10. If P = $\dfrac{x^3+y^3}{(x-y)^2+3xy}$, Q = $\dfrac{(x+y)^2-3xy}{x^3-y^3}$ and R = $\dfrac{(x+y)^2-(x-y)^2}{x^2-y^2}$ then what is the value of (P ÷ Q) × R ?

यदि P = $\dfrac{x^3+y^3}{(x-y)^2+3xy}$, Q = $\dfrac{(x+y)^2-3xy}{x^3-y^3}$ और R = $\dfrac{(x+y)^2-(x-y)^2}{x^2-y^2}$ है, तो (P ÷ Q) × R का मान क्या है ?

(A) 2xy (B) $2(x^2+y^2)$
(C) x^2+y^2 (D) 4xy

11. The value of / का मान क्या है ?

$\dfrac{3\frac{2}{3}\div\frac{11}{30}\text{ of }\frac{2}{3}-\frac{1}{4}\text{ of }2\frac{1}{2}\div\frac{3}{5}\times 4\frac{4}{5}}{\frac{2}{5}\text{ of }7\frac{1}{2}\div\frac{3}{4}-\frac{3}{4}\times 1\frac{1}{2}\div 2\frac{1}{4}}$ is :

(A) $2\frac{2}{9}$ (B) $\frac{10}{21}$

(C) $2\frac{6}{7}$ (D) $3\frac{4}{7}$

12. The value of / का मान ज्ञात कीजिये।

$\frac{3}{5}\times 1\frac{7}{8}\div 1\frac{1}{3}\text{ of }\frac{3}{16}-\left(3\frac{1}{5}\div 4\frac{1}{2}\text{ of }5\frac{1}{3}\right)\times 2\frac{1}{2}+\frac{1}{2}+\frac{1}{8}\div\frac{1}{4}$

is :

(A) $4\frac{1}{3}$ (B) $5\frac{5}{6}$

(C) $5\frac{1}{6}$ (D) $4\frac{1}{8}$

13. The value of $-1+\frac{1}{4}\div\frac{1}{2}\times 2+5$ is :

$-1+\frac{1}{4}\div\frac{1}{2}\times 2+5$ का मान _____ है—

(A) 5 (B) 2

(C) $\frac{17}{4}$ (D) $-\frac{7}{2}$

14. If '+' means '–', '–' means '+', '×' means '÷' and '÷' means '×' then the value of $\dfrac{\left[(30\times 5)+(84\times 6)\right]\div 5}{\left[\frac{2}{3}\div 18\right]-[4\div 2]}$

is :

यदि '+' का अर्थ '–', '–' का अर्थ '+', '×' का अर्थ '÷' और '÷' का अर्थ '×' है, तो $\dfrac{\left[(30\times 5)+(84\times 6)\right]\div 5}{\left[\frac{2}{3}\div 18\right]-[4\div 2]}$ का मान बताइए।

(A) –2 (B) 2
(C) –1 (D) 1

15. Solve the following
निम्नलिखित समीकरण को हल करें :
113 × 87 = ?
(A) 10000 (B) 10026
(C) 9831 (D) 10169

16. Solve the following
निम्न समीकरण को हल करें :

$\frac{4}{3}\div\frac{1}{6}\times 2-1=?$

(A) –2 (B) 8
(C) 3 (D) 15

17. The value of $\frac{[54-(5\div 2)+8]+13}{48-4\div 3\times 8-2}$ is :

$\frac{[54-(5\div 2)+8]+13}{48-4\div 3\times 8-2}$ का मान ज्ञात कीजिये।

(A) $\frac{89}{127}$ (B) $\frac{89}{106}$

(C) $\frac{141}{127}$ (D) $\frac{141}{106}$

18. The value of 3 – (9 – 3 × 8 ÷ 2) is
3 – (9 – 3 × 8 ÷ 2) का मान ज्ञात कीजिये।
(A) –21 (B) 6
(C) 0 (D) 21/2

19. The value of / का मान ज्ञात कीजिये।

$1\frac{1}{8}\div\left(4\frac{1}{4}\div\frac{3}{5}\text{of}8\frac{1}{2}\right)-\frac{2}{5}\times 1\frac{1}{3}\div\frac{4}{5}\text{of}\,1\frac{2}{3}+\frac{11}{20}$ is

(A) $1\frac{1}{2}$ (B) $1\frac{1}{4}$

(C) $3\frac{1}{8}$ (D) $3\frac{1}{2}$

20. Solve the following expression.
निम्नलिखित व्यंजक का मान क्या है ?
5.6 – {2 +0.6 of (2.1 – 2.6 × 1.12)}
(A) 4.0871 (B) 4.0872
(C) 7.7113 (D) 7.7112

21. The value of 1800 ÷ 20 × {(12 – 6) + (24 – 12)} is :
1800 ÷ 20 × {(12 – 6) + (24 – 12)} का मान क्या होगा ?
(A) 1720 (B) 1620
(C) 840 (D) 2720

22. Solve the following expression.
निम्नलिखित व्यंजक को हल करें।
11 + 11 × 11 – 11 ÷ 11
(A) 131 (B) 11
(C) 121 (D) 22

23. The value of (26 – 13 × 2) ÷ 2 + 1 is
(26 – 13 × 2) ÷ 2 + 1 का मान ज्ञात कीजिये।

(A) $\frac{26}{3}$ (B) 0

(C) 1 (D) 14

Solution

1. (C) $\frac{42-12\times 3+8\div 2+15}{8\times 2-4+9\div 3}$

Change signs

$=\frac{42+12\div 3-8\times 2-15}{8\div 2+4-9\times 3}$

$=\frac{42+4-16-15}{4+4-27}=-\frac{15}{19}$

2. (B) $\left(18\div 2\,\text{of}\,\frac{1}{4}\right)\times\left(\frac{2}{3}\div\frac{3}{4}\times\frac{5}{8}\right)\div\left(\frac{2}{3}\div\frac{3}{4}\,\text{of}\,\frac{3}{4}\right)$

$=18\times 2\times\left(\frac{2}{3}\times\frac{4}{3}\times\frac{5}{8}\right)\div\left(\frac{2}{3}\times\frac{4\times 4}{3\times 3}\right)$

$=36\times\frac{5}{9}\times\frac{3\times 3\times 3}{2\times 4\times 4}=\frac{135}{8}=16\frac{7}{8}$

3. (A) $-\frac{5}{2}+\frac{3}{2}\div 6\times\frac{1}{2}$

$=-\frac{5}{2}+\frac{3}{2\times 6}\times\frac{1}{2}=\frac{5}{2}+\frac{1}{8}$

$=\frac{-20+1}{8}=\frac{-19}{8}$

4. (D)

$\frac{36\div 42\,\text{of}\,6\times 7+24\times 6\div 18+3\div(2-6)-(4+3\times 2)\div 8}{21\div 3\,\text{of}\,7}$

$=\frac{36}{42\times 6}\times 7+24\times\frac{6}{18}-\frac{3}{4}-\frac{10}{8}$

$=1+8-\frac{3}{4}-\frac{5}{4}=9-2=7$

5. (B) $\frac{7-\left[4+3\left(2-2\times 2+5\right)-8\right]\div 5}{2\div 2\,\text{of}\left(4+4\div 4\,\text{of}\,4\right)}$

$=\frac{7-\left[4+3(2-4+5)-8\right]\div 5}{2\div 2\,\text{of}\left(4+\frac{1}{4}\right)}$

$\frac{7-\left[4+3(3)-8\right]\div 5}{2\div 2\times\frac{17}{4}}$

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$$= \frac{7-[5]\div 5}{2\times\frac{2}{17}} = \frac{7-1}{\frac{4}{17}}$$

$$= \frac{6\times 17}{4} = \frac{51}{2} = 25\frac{1}{2}$$

6. (A) $\dfrac{x^3-y^3}{x\left[(x+y)^2-3xy\right]} \div \dfrac{y\left[(x-y)^2+3xy\right]}{x^3+y^3} \times \dfrac{(x+y)^2-(x-y)^2}{x^2-y^2}$

$$= \frac{x^3-y^3}{x\left(x^2+y^2-xy\right)} \times \frac{x^3+y^3}{y\left(x^2+y^2+xy\right)} \times \frac{4xy}{x^2-y^2}$$

$$= \frac{4(x+y)\left(x^2-xy+y^2\right)\times(x-y)\left(x^2+y^2+xy\right)}{\left(x^2+y^2-xy\right)\left(x^2+y^2+xy\right)\times\left(x^2-y^2\right)}$$

$= 4$

7. (A) $P = \dfrac{x^4-8x}{x^3-x^2-2x}$; $Q = \dfrac{x^2+2x+1}{x^2-4x-5}$; $R = \dfrac{2x^2+4x+8}{x-5}$

$$(P \times Q) \div R = \left[\frac{x^4-8x}{x^3-x^2-2x}\times\frac{x^2+2x+1}{x^2-4x-5}\right]\times\frac{x-5}{2x^2+4x+8}$$

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

$$= \frac{(x-2)}{(x+1)(x-2)}\times\frac{(x+1)^2}{(x+1)(x-5)}\times\frac{(x-5)}{2}$$

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

8. (B) $$\frac{5\frac{1}{2}\div 3\frac{2}{3}\text{ of }\frac{1}{4}+\left(5\frac{1}{9}-7\frac{7}{8}\div 9\frac{9}{20}\right)\times\frac{9}{11}}{5\div 5\text{ of }\frac{1}{10}-10\times 10\div 20}$$

$$= \frac{\frac{11}{2}\div\frac{11\times 1}{3\times 4}+\left[\frac{46}{9}-\frac{63}{8}\times\frac{20}{189}\right]\times\frac{9}{11}}{10-5}$$

$$= \frac{1}{5}\left[\frac{11}{2}\times\frac{12}{11}+\left\{\frac{46}{9}-\frac{5}{6}\right\}\times\frac{9}{11}\right]$$

$$= \frac{1}{5}\left[6+\frac{77}{18}\times\frac{9}{11}\right] = \frac{1}{5}\left[6+\frac{7}{2}\right]$$

$$= \frac{1}{5}\left[\frac{19}{2}\right] = \frac{19}{10} = 1\frac{9}{10}$$

9. **(B)** $$\frac{8\div[(8-3)\div\{(4\div 4\text{ of }8)+4-4\times 4\div 8\}-2]}{8\times 8\div 4-8\div 8\text{ of }2-7}$$

$$= \frac{8\times\frac{17}{6}}{16-\frac{1}{2}-\frac{1}{7}}$$

$$= \frac{68}{3}\times\frac{2}{17} = \frac{8}{3}$$

10. (D) $P = \dfrac{x^3+y^3}{(x-y)^2+3xy}$, $Q = \dfrac{(x+y)^2-3xy}{x^3-y^3}$

$$R = \frac{(x+y)^2-(x-y)^2}{x^2-y^2}$$

$$(P\div Q)\times R = \frac{x^3+y^3}{(x-y)^2+3xy}\times\frac{x^3-y^3}{(x+y)^2-3xy}$$

$$\times\frac{(x+y)^2-(x-y)^2}{x^2-y^2}$$

$$= \frac{(x+y)(x^2+y^2-2xy)}{(x^2+y^2+xy)}\times\frac{(x-y)(x^2+y^2+xy)}{(x^2+y^2-xy)}$$

$$\times\frac{4xy}{(x-y)(x+y)} = 4xy$$

11. (C) $$\frac{3\frac{2}{3}\div\frac{11}{30}\text{ of }\frac{2}{3}-\frac{1}{4}\text{ of }2\frac{1}{2}\div\frac{3}{5}\times 4\frac{4}{5}}{\frac{2}{5}\text{ of }7\frac{1}{2}\div\frac{3}{4}-\frac{3}{4}\times 1\frac{1}{2}\div 2\frac{1}{4}}$$

$$= \frac{\frac{11}{3}\times\frac{30\times 3}{11\times 2}-\frac{1}{4}\times\frac{5}{2}\times\frac{5}{3}\times\frac{24}{5}}{\frac{2\times 15}{5\times 2}\times\frac{4}{3}-\frac{3}{4}\times\frac{3}{2}\times\frac{4}{9}}$$

$$= \frac{15-5}{4-\frac{1}{2}} = \frac{10}{\frac{7}{2}} = \frac{20}{7} = 2\frac{6}{7}$$

12. (C) $\frac{3}{5}\times 1\frac{7}{8}\div 1\frac{1}{3}\text{ of }\frac{3}{16}-\left(3\frac{1}{5}\div 4\frac{1}{2}\text{of }5\frac{1}{3}\right)\times 2\frac{1}{2}+\frac{1}{2}+\frac{1}{8}\div\frac{1}{4}$

$=\frac{3}{5}\times\frac{15}{8}\times 4-\left(\frac{16}{5}\times\frac{1}{24}\right)\frac{5}{2}+\frac{1}{2}+\frac{1}{2}$

$=\frac{9}{2}-\frac{1}{3}+1$

$=\frac{31}{6}=5\frac{1}{6}$

13. (A) Value of $-1+\frac{1}{4}\div\frac{1}{2}\times 2+5$

$=-1+1+5=5$

14. (A) $\frac{\left[(30\div 5)-(84\div 6)\right]\times 5}{\left[\frac{2}{3}\times 18\right]+[4\times 2]}$

$\frac{[6-14]\times 5}{12+8}=\frac{-40}{20}=-2$

15. (C) $113\times 87=(100+13)\times(100-13)$
$=(100^2-13^2)=10000-169=9831$

16. (D) $\frac{4}{3}\div\frac{1}{6}\times 2-1$

$=\frac{4}{3}\times 6\times 2-1=15$

17. (D) $\frac{\left[54-(5\div 2)\times 8\right]+13}{48-4\div 3\times 8-2}=\frac{47}{46-\frac{32}{3}}=\frac{141}{106}$

18. (B) $3-(9-3\times 8\div 2)=6$

19. (C) $1\frac{1}{8}\div\left(4\frac{1}{4}\div\frac{3}{5}\text{of}8\frac{1}{2}\right)-\frac{2}{5}\times 1\frac{1}{3}\div\frac{4}{5}\text{ of }1\frac{2}{3}+\frac{11}{20}$

$=\frac{9}{8}\times\frac{6}{5}-\frac{2}{5}+\frac{11}{20}$

$=\frac{27}{20}-\frac{2}{5}+\frac{11}{20}$

$\Rightarrow\frac{27-8+11}{20}=1\frac{1}{2}$

20. (B) $5.6-\{2+0.6\text{ of }(2.1-2.6\times 1.12)\}$

$=5.6-\{2-4.872\}$

$=4.0872$

21. (B) $1800\div 20\times\{(12-6)+(24-12)\}$

$\Rightarrow\frac{1800}{20}\times\{6+12\}$

$\Rightarrow 90\times 18=1620$

22. (A) $11+11\times 11-11\div 11$
$=11+121-1=131$

23. (C) $(26-13\times 2)\div 2+1$
$0\div 2+1=1$

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Simplification (CGL_Pre — 2018)

1. $21.6 \div 3.6 \times 2 + 0.25 \times 16 \div 4 - 6$ is equal to :
$21.6 \div 3.6 \times 2 + 0.25 \times 16 \div 4 - 6$ बराबर है :
(A) 6 (B) 5
(C) 8 (D) 7

2. The value of $15.2 + 5.8 \div 2.9 \times 2 - 3.5 \times 2 \div 0.5$ is equal to:
$15.2 + 5.8 \div 2.9 \times 2 - 3.5 \times 2 \div 0.5$ का मान बराबर है:
(A) 4.8 (B) 3.2
(C) 5.2 (D) 5.4

3. $9\frac{3}{4} \div \left[2\frac{1}{6} \div \left\{4\frac{1}{3} - \left(2\frac{1}{2} + \frac{3}{4}\right)\right\}\right]$ is equal to:

$9\frac{3}{4} \div \left[2\frac{1}{6} \div \left\{4\frac{1}{3} - \left(2\frac{1}{2} + \frac{3}{4}\right)\right\}\right]$ का मान है :

(A) $\frac{15}{4}$ (B) 3

(C) $\frac{39}{8}$ (D) 4

4. The value of $3.8 + (8.2 \div 4.1 \times 2) - 4 \times 3 \div 1.2$
$3.8 + (8.2 \div 4.1 \times 2) - 4 \times 3 \div 1.2$ का मान है :
(A) 2.2 (B) –1.2
(C) 1.2 (D) –2.2

5. The value of $7.5 + (5.4 \div 4.5 \times 2) - 8 \times 4 \div 3.2$
$7.5 + (5.4 \div 4.5 \times 2) - 8 \times 4 \div 3.2$ का मान है :
(A) 0.1 (B) –0.1
(C) –0.2 (D) 0.2

6. The value of : $108 \div 36 \times 4 + 2.5 \times 4 \div 0.5 - 10$
$108 \div 36 \times 4 + 2.5 \times 4 \div 0.5 - 10$ का मान है :
(A) 18 (B) 16
(C) 22 (D) 20

7. The value of

$2.8 + (5.2 \div 1.3 \times 2) - 6 \times 3 \div 8 + 2$

का मान है:
(A) 6.45 (B) 4.55
(C) 8.45 (D) 10.55

8. The value of
$7.2 + (8.4 \div 0.12 \times 0.2) - 5 \times 3 \div 0.05 + 3$
का मान होगा ?
(A) – 75.5 (B) – 275.8
(C) 21.2 (D) – 175.8

9. The value of
$5.8 + (7.4 \div 3.7 \times 5) - 6 \times 2 \div 2.5$
का मान होगा ?
(A) 12 (B) 11
(C) 10 (D) 9

10. The value of $\frac{8}{9}$ of $\left(5\frac{1}{4} \div 2\frac{1}{3} \text{ of } 4\right) \div \left(8 \div \frac{2}{3} \text{ of } \frac{4}{5}\right)$ of $\left(8 \times \frac{2}{3} \div \frac{4}{5}\right)$ is :

$\left(5\frac{1}{4} \div 2\frac{1}{3} \text{ of } 4\right)$ का $\frac{8}{9} \div \left(8 \div \frac{2}{3} \text{ of } \frac{4}{5}\right)$ का $\left(8 \times \frac{2}{3} \div \frac{4}{5}\right)$ का मान है ?

(A) $1\frac{1}{8}$ (B) $\frac{4}{15}$ (C) $\frac{1}{200}$ (D) $\frac{1}{100}$

11. The value of $7\frac{1}{2} \times \left(3\frac{1}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{2}\right) + \left[11 - \left(\frac{5}{8} + 3 - 1\frac{1}{4}\right)\right] \div 5\frac{3}{4} - 5 \div 5 \times 5$ of $5 \div 25$ is:

$7\frac{1}{2} \times \left(3\frac{1}{5} \div 4\frac{1}{2} \text{का } 5\frac{1}{2}\right) + \left[11 - \left(\frac{5}{8} + 3 - 1\frac{1}{4}\right)\right] \div 5\frac{3}{4} - 5 \div 5 \times 5$ का $5 \div 25$ का मान है:/य

(A) $\frac{1}{2}$ (B) $\frac{1}{10}$ (C) $\frac{3}{10}$ (D) None

12. The value of $6 - 6 \div 6 \times 6 + (6 \div 6 \text{ of } 6) \times 6 - \left(3\frac{2}{3} \div \frac{11}{30} \text{ of } \frac{2}{3}\right) \div 5$ is:

$6 - 6 \div 6 \times 6 + (6 \div 6 \text{ का } 6) \times 6 - \left(3\frac{2}{3} \div \frac{11}{30} \text{का } \frac{2}{3}\right)$ का मान है:
(A) 0 (B) 2
(C) –1 (D) –14

13. The value of $\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9}$ of $1\frac{1}{5} + \frac{2}{23} \times 3\frac{5}{6} \div \frac{2}{7}$ of $2\frac{1}{3}$ is :

$\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9}$ का $1\frac{1}{5} + \frac{2}{23} \times 3\frac{5}{6} \div \frac{2}{7}$ का $2\frac{1}{3}$ का मान है :

(A) $1\frac{5}{6}$ (B) $1\frac{2}{3}$ (C) $3\frac{1}{2}$ (D) $4\frac{5}{6}$

14. The value of $4.5 - (3.2 \div 0.8 \times 5) + 3 \times 4 \div 6$ is :
$4.5 - (3.2 \div 0.8 \times 5) + 3 \times 4 \div 6$ का मान है :

(A) –13.5 (B) 4.2
(C) –8.5 (D) 5.7

15. The value of 3.8 – (4.2 ÷ 0.7 × 3) + 5 × 2 ÷ 0.5 is:
3.8 – (4.2 ÷ 0.7 × 3) + 5 × 2 ÷ 0.5 का मान है :
(A) 5.8 (B) 18.4
(C) 21.8 (D) 15.6

16. The value of (5 + 3 ÷ 5 × 5) ÷ (3 ÷ 3 of 6) of (4 × 4 ÷ 4 of 4 + 4 ÷ 4 × 4) is:
(5 + 3 ÷ 5 × 5) ÷ (4 × 4 ÷ 4 का 4 + 4 ÷ 4 × 4) का (3 ÷ 6 का 3) का मान है:

(A) $8\frac{1}{5}$ (B) $7\frac{1}{3}$ (C) $9\frac{3}{5}$ (D) $6\frac{2}{3}$

17. The value of $\frac{9}{15}$ of $\left(\frac{2}{3}\div\frac{2}{3}\text{of}\frac{3}{2}\right)\div\left(\frac{3}{4}\times\frac{3}{4}\div\frac{3}{4}\text{of}\frac{4}{3}\right)$ of $\left(\frac{5}{4}\div\frac{5}{2}\times\frac{2}{5}\text{of}\frac{4}{5}\right)$ is:

$\left(\frac{2}{3}\div\frac{2}{3}\text{का}\frac{3}{2}\right)$ का $\frac{9}{15}$ ÷ $\left(\frac{3}{4}\times\frac{3}{4}\div\frac{3}{4}\text{का}\frac{4}{3}\right)$ का $\left(\frac{5}{4}\div\frac{5}{2}\times\frac{2}{5}\text{का}\frac{4}{5}\right)$ का मान है:

(A) $\frac{20}{9}$ (B) $\frac{4}{25}$ (C) $\frac{18}{125}$ (D) $\frac{40}{9}$

18. The value of 16 ÷ 4 Of 4 × [3 ÷ 4 of {4 × 3 ÷ (3 + 3)}] ÷ (2 ÷ 4 of 8) is:
16 ÷ 4 का 4 × [3 ÷ {3 + 3} का 4] ÷ (2 ÷ 8 का 4) का मान है:
(A) 6 (B) 9
(C) 48 (D) 16

19. The value of 2 × 3 ÷ 2 of 3 × 2 ÷ (4 + 4 × 4 ÷ 4 of 4 – 4 ÷ 4 × 4) is:
2 × 3 ÷ 2 का 3 × 2 ÷ (4 + 4 × 4 ÷ 4 का 4 – 4 ÷ 4 × 4) का मान है :
(A) 8 (B) 1 (C) 4 (D) 2

20. The value of 5 ÷ 5 of 5×2 + 2 ÷ 2 of 2 × 5 – (5 – 2) ÷ 6 × 2 is:
5 ÷ 5 का 5×2 + 2 ÷ 2 का 2 × 5 – (5 – 2) ÷ 6 × 2 का मान है :

(A) $\frac{9}{5}$ (B) $\frac{19}{10}$ (C) 19 (D) $\frac{23}{2}$

Solution

1. (D) $\frac{21.6}{3.6}\times2+0.25\times\frac{16}{4}-6$

= 12 + 1 – 6 = 7

2. (C) 15.2 + 5.8 ÷ 2.9 × 2 – 3.5 × 2 ÷ 0.5

$15.2+\frac{5.8}{2.9}\times2-3.5\times\frac{2}{0.5}$

15.2 + 4 – 3.5 × 4
15.2 + 4 – 14
19.2 – 14 = 5.2

3. (C) $\frac{39}{4}\div\left[\frac{13}{6}\div\left\{\frac{13}{3}-\left(\frac{13}{4}\right)\right\}\right]$

$=\frac{39}{4}\div\left[\frac{13}{6}\times\frac{12}{13}\right]$

$=\frac{39}{4}\times\frac{1}{2}=\frac{39}{8}$

4. (D) $3.8+\left(\frac{8.2}{4.1}\times2\right)-4\times\frac{3}{1.2}$

= 3.8 + 4 – 10
= 7.8 – 10 = –2.2

5. (B) 7.5 + (5.4 ÷ 4.5 × 2) – 8 × 4 ÷ 3.2

$7.5+\left(\frac{5.4}{4.5}\times2\right)-\frac{8\times4}{3.2}$

$7.5+\frac{6}{5}\times2-10$

$\frac{15}{2}+\frac{12}{5}-10$

= 7.5 + 2.4 – 10
= 9.9 – 10 = –0.1

6. (C) 108 ÷ 36 × 4 + 2.5 × 4 ÷ 0.5 – 10

$\frac{108}{36}\times4+2.5\times4\div0.5-10$

$12+\frac{2.5\times4}{0.5}-10$

= 12 + 20 - 10
= 32 - 10
= 22

7. (D) 2.8 + (5.2 ÷ 1.3 × 2) – 6 × 3 ÷ 8 + 2

$2.8 + \left(\frac{5.2}{1.3} \times 2\right) - 6 \times \frac{3}{8} + 2$

$2.8 + .8 - \frac{9}{4} + 2$

$12.8 - 2.25 = 10.55$

8. (B) $7.2 + \left(\frac{8.4}{0.12} \times 0.2\right) - 5 \times \frac{3}{0.05} + 3$

$7.2 + (70 \times 0.2) - \frac{5 \times 3}{5} \times 100 + 3$

$= 7.2 + 14 - 300 + 3$

$= 24.2 - 300 = -275.8$

9. (B) $5.8 + \frac{7.4}{3.7} \times 5 - 6 \times \frac{2}{2.5}$

$5.8 + 10 - \frac{6 \times 2 \times 2}{5}$

$= 15.8 - \frac{24}{5}$

$= 15.8 - 4.8 = 11$

10. (C) Use BODMAS

11. (D) USE BODMAS

12. (D)

13. (C)

14. (A) $4.5 - \left(\frac{3.2}{0.8} \times 5\right) + 3 \times \frac{4}{6}$

$4.5 - 20 + 2$

$= -13.5$

15. (A) $3.8 - \left(\frac{4.2}{0.7} \times 3\right) + 5 \times 2 \times 10/5$

$3.8 - 18 + 20$

$3.8 + 2 = 5.8$

16. (C) $\left(5 + \frac{3}{5} \times 5\right) \div \left(4 \times \frac{4}{16} + \frac{4}{4} \times 4\right) \times \left(\frac{3}{18}\right)$

$= 8 \div (1 + 4) \times \frac{3}{18}$

$8 \div \frac{15}{18}$

$8 \times \frac{18}{15} = \frac{8 \times 6}{5}$

$= \frac{48}{5} = 9\frac{3}{5}$

17. (D) $\frac{9}{15} \times \left(\frac{2}{3}\right) \div \left(\frac{9}{16}\right) \times \left(\frac{5}{4} \div \frac{5}{2} \times \frac{2}{5} \times \frac{4}{5}\right)$

$\frac{9}{15} \times \frac{2}{3} \div \left(\frac{9}{16}\right) \times \left(\frac{5}{4} \times \frac{2}{5} \times \frac{8}{25}\right)$

$= \frac{9}{15} \times \frac{2}{3} \div \left(\frac{9}{16} \times \frac{5}{4} \times \frac{2}{5} \times \frac{8}{25}\right)$

$= \frac{9}{15} \times \frac{2}{3} \times \frac{100}{9} \rightarrow \frac{40}{9}$

18. (A) $16 \div 4 \times 4 \times [3 \div 4 \times \{4 \times 3 \div (6)\}] \div (2 \div 4 \times 8)$

$\frac{16}{16} \times [3 \div 4 \times 2] \div \left(\frac{2}{32}\right)$

$1 \times \left[\frac{3}{8}\right] \times \frac{32}{2} = 6$

19. (D) $\frac{2 \times 3}{6} \times 2 \div \left(4 + \frac{4 \times 4}{16} - \frac{4}{4} \times 4\right)$

$1 \times 2 \div (4 + 1 - 4)$

$1 \times \frac{2}{1} = 2$

20. (B) $5 \div 5$ of $5 \times 2 + 2 \div 2$ of $2 \times 5 - (5 - 2) \div 6 \times 2$

$5 \div 5 \times 5 \times 2 + 2 \div 2 \times 2 \times 5 - 3 \div 6 \times 2$

$5 \div 25 \times 2 + 2 \div 4 \times 5 - 3 \div 6 \times 2$

$\frac{1}{5} \times 2 + \frac{1}{2} \times 5 - \frac{1}{2} \times 2$

$= \frac{2}{5} + \frac{5}{2} - 1$

$= \frac{4 + 25 - 10}{10} = \frac{19}{10}$

Simplification (CGL_Pre — 2017)

1. What is the value of $\left[\frac{12}{(\sqrt{5}+\sqrt{3})}\right]+\left[\frac{18}{(\sqrt{5}-\sqrt{3})}\right]$?

$\left[\frac{12}{(\sqrt{5}+\sqrt{3})}\right]+\left[\frac{18}{(\sqrt{5}-\sqrt{3})}\right]$ का मान क्या है ?

(A) $15(\sqrt{5}-\sqrt{3})$ (B) $3(5\sqrt{5}+\sqrt{3})$

(C) $15(\sqrt{5}+\sqrt{3})$ (D) $3(3\sqrt{5}+\sqrt{3})$

2. Which one is the largest among the fractions (5/113), (7/120), (13/145) and (17/160)?
(5/113), (7/120), (13/145) तथा (17/160) में से सबसे बड़ा भिन्न कौन सा है?

(A) 5/113 (B) 7/120
(C) 13/145 (D) 17/160

3. Which value among $\sqrt[3]{5}$, $\sqrt[4]{6}$, $\sqrt[6]{12}$, $\sqrt[12]{276}$ is the largest?

$\sqrt[3]{5}$, $\sqrt[4]{6}$, $\sqrt[6]{12}$, $\sqrt[12]{276}$ में से सबसे बड़ी संख्या कौन सी है ?

(A) $\sqrt[3]{5}$ (B) $\sqrt[4]{6}$

(C) $\sqrt[6]{12}$ (D) $\sqrt[12]{276}$

4. Select the correct option:
Convert binary 1101111 to decimal.
सही विकल्प चुनिए:
बाइनरी 1101111 को दशमलव में बदलें।

(A) 111 (B) 101
(C) 110 (D) 100

5. What is the value of 9991 × 10009 ?
9991 × 10009 का मान क्या है ?

(A) 99999099 (B) 99999819
(C) 99999919 (D) 99999019

6.. Select the correct option:
Convert decimal 101 to binary .
सही विकल्प चुनिए:
दशमलव 101 को बाइनरी में बदलें।

(A) 1101001 (B) 1100111
(C) 1101011 (D) 1100101

7. 9997 x 10003 = ?

(A) 9999991 (B) 99999911
(C) 99999991 (D) 9999911

8. Select the correct option:
Convert decimal 99 to binary.
सही विकल्प चुनिए:
दशमलव 99 को बाइनरी में बदलें।

(A) 1100101 (B) 1101001
(C) 11100011 (D) 1100011

9. 21.6 ÷ 3.6 × 2 + 0.25 × 16 ÷ 4 – 6 is equal to :
21.6 ÷ 3.6 × 2 + 0.25 × 16 ÷ 4 – 6 बराबर है :

(A) 6 (B) 5
(C) 8 (D) 7

10. The value of 15.2 + 5.8 ÷ 2.9 × 2 – 3.5 × 2 ÷ 0.5 is equal to:
15.2 + 5.8 ÷ 2.9 × 2 – 3.5 × 2 ÷ 0.5 का मान बराबर है:

(A) 4.8 (B) 3.2
(C) 5.2 (D) 5.4

11. $9\frac{3}{4}\div\left[2\frac{1}{6}\div\left\{4\frac{1}{3}-\left(2\frac{1}{2}+\frac{3}{4}\right)\right\}\right]$ is equal to:

$9\frac{3}{4}\div\left[2\frac{1}{6}\div\left\{4\frac{1}{3}-\left(2\frac{1}{2}+\frac{3}{4}\right)\right\}\right]$ का मान है :

(A) $\frac{15}{4}$ (B) 3

(C) $\frac{39}{8}$ (D) 4

12. The value of 3.8 + (8.2 ÷ 4.1 × 2) – 4 × 3 ÷ 1.2
3.8 + (8.2 ÷ 4.1 × 2) – 4 × 3 ÷ 1.2 का मान है :

(A) 2.2 (B) –1.2
(C) 1.2 (D) –2.2

13. The value of 7.5 + (5.4 ÷ 4.5 × 2) – 8 × 4 ÷ 3.2
7.5 + (5.4 ÷ 4.5 × 2) – 8 × 4 ÷ 3.2 का मान है :

(A) 0.1 (B) –0.1
(C) –0.2 (D) 0.2

14. The value of : 108 ÷ 36 × 4 + 2.5 × 4 ÷ 0.5 – 10
108 ÷ 36 × 4 + 2.5 × 4 ÷ 0.5 – 10 का मान है :

(A) 18 (B) 16
(C) 22 (D) 20

15. The value of
2.8 + (5.2 ÷ 1.3 × 2) – 6 × 3 ÷ 8 + 2
का मान है:

(A) 6.45 (B) 4.55
(C) 8.45 (D) 10.55

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16. The value of
$7.2 + (8.4 \div 0.12 \times 0.2) - 5 \times 3 \div 0.05 + 3$
का मान होगा?
(A) – 75.5 (B) – 275.8
(C) 21.2 (D) – 175.8

17. The value of
$5.8 + (7.4 \div 3.7 \times 5) - 6 \times 2 \div 2.5$
का मान होगा?
(A) 12 (B) 11
(C) 10 (D) 9

18. The value of $\frac{8}{9}$ of $\left(5\frac{1}{4} \div 2\frac{1}{3} \text{ of } 4\right) \div \left(8 \div \frac{2}{3} \text{ of } \frac{4}{5}\right)$ of $\left(8 \times \frac{2}{3} \div \frac{4}{5}\right)$ is :

$\left(5\frac{1}{4} \div 2\frac{1}{3} \text{ of } 4\right)$ का $\frac{8}{9} \div \left(8 \div \frac{2}{3} \text{ of } \frac{4}{5}\right)$ का $\left(8 \times \frac{2}{3} \div \frac{4}{5}\right)$ का मान है?

(A) $1\frac{1}{8}$ (B) $\frac{4}{15}$ (C) $\frac{1}{200}$ (D) $\frac{1}{100}$

19. The value of $7\frac{1}{2} \times \left(3\frac{1}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{2}\right) + \left[11 - \left(\frac{5}{8} + 3 - 1\frac{1}{4}\right)\right] \div 5\frac{3}{4} - 5 \div 5 \times 5$ of $5 \div 25$ is:

$7\frac{1}{2} \times \left(3\frac{1}{5} \div 4\frac{1}{2} \text{ का } 5\frac{1}{2}\right) + \left[11 - \left(\frac{5}{8} + 3 - 1\frac{1}{4}\right)\right] \div 5\frac{3}{4} - 5 \div 5 \times 5$ का $5 \div 25$ का मान है:/य

(A) $\frac{1}{2}$ (B) $\frac{1}{10}$ (C) $\frac{3}{10}$ (D) None

20. The value of $6 - 6 \div 6 \times 6 + (6 \div 6 \text{ of } 6) \times 6 - \left(3\frac{2}{3} \div \frac{11}{30} \text{ of } \frac{2}{3}\right) \div 5$ is:

$6 - 6 \div 6 \times 6 + (6 \div 6 \text{ का } 6) \times 6 - \left(3\frac{2}{3} \div \frac{11}{30} \text{ का } \frac{2}{3}\right)$ का मान है:
(A) 0 (B) 2
(C) –1 (D) –14

21. The value of $\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9}$ of $1\frac{1}{5} + \frac{2}{23} \times 3\frac{5}{6} \div \frac{2}{7}$ of $2\frac{1}{3}$ is :

$\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9}$ का $1\frac{1}{5} + \frac{2}{23} \times 3\frac{5}{6} \div \frac{2}{7}$ का $2\frac{1}{3}$ का मान है :

(A) $1\frac{5}{6}$ (B) $1\frac{2}{3}$ (C) $3\frac{1}{2}$ (D) $4\frac{5}{6}$

22. The value of $4.5 - (3.2 \div 0.8 \times 5) + 3 \times 4 \div 6$ is :
$4.5 - (3.2 \div 0.8 \times 5) + 3 \times 4 \div 6$ का मान है :
(A) –13.5 (B) 4.2
(C) –8.5 (D) 5.7

23. The value of $3.8 - (4.2 \div 0.7 \times 3) + 5 \times 2 \div 0.5$ is:
$3.8 - (4.2 \div 0.7 \times 3) + 5 \times 2 \div 0.5$ का मान है :
(A) 5.8 (B) 18.4
(C) 21.8 (D) 15.6

24. The value of $(5 + 3 \div 5 \times 5) \div (3 \div 3 \text{ of } 6)$ of $(4 \times 4 \div 4$ of $4 + 4 \div 4 \times 4)$ is:
$(5 + 3 \div 5 \times 5) \div (4 \times 4 \div 4$ का $4 + 4 \div 4 \times 4)$ का $(3 \div 6$ का $3)$ का मान है:
(A) $8\frac{1}{5}$ (B) $7\frac{1}{3}$ (C) $9\frac{3}{5}$ (D) $6\frac{2}{3}$

25. The value of $\frac{9}{15}$ of $\left(\frac{2}{3} \div \frac{2}{3} \text{ of } \frac{3}{2}\right) \div \left(\frac{3}{4} \times \frac{3}{4} \div \frac{3}{4} \text{ of } \frac{4}{3}\right)$ of $\left(\frac{5}{4} \div \frac{5}{2} \times \frac{2}{5} \text{ of } \frac{4}{5}\right)$ is:

$\left(\frac{2}{3} \div \frac{2}{3} \text{ का } \frac{3}{2}\right)$ का $\frac{9}{15} \div \left(\frac{3}{4} \times \frac{3}{4} \div \frac{3}{4} \text{ का } \frac{4}{3}\right)$ का $\left(\frac{5}{4} \div \frac{5}{2} \times \frac{2}{5} \text{ का } \frac{4}{5}\right)$ का मान है:

(A) $\frac{20}{9}$ (B) $\frac{4}{25}$ (C) $\frac{18}{125}$ (D) $\frac{40}{9}$

26. The value of $16 \div 4$ Of $4 \times [3 \div 4$ of $\{4 \times 3 \div (3 + 3)\}] \div (2 \div 4$ of $8)$ is:
$16 \div 4$ का $4 \times [3 \div \{3 + 3\}$ का $4] \div (2 \div 8$ का $4)$ का मान है:
(A) 6 (B) 9
(C) 48 (D) 16

27. The value of $2 \times 3 \div 2$ of $3 \times 2 \div (4 + 4 \times 4 \div 4$ of $4 - 4 \div 4 \times 4)$ is:
$2 \times 3 \div 2$ का $3 \times 2 \div (4 + 4 \times 4 \div 4$ का $4 - 4 \div 4 \times 4)$ का मान है :
(A) 8 (B) 1 (C) 4 (D) 2

28. The value of $5 \div 5$ of $5 \times 2 + 2 \div 2$ of $2 \times 5 - (5 - 2) \div 6 \times 2$ is:
$5 \div 5$ का $5 \times 2 + 2 \div 2$ का $2 \times 5 - (5 - 2) \div 6 \times 2$ का मान है :
(A) $\frac{9}{5}$ (B) $\frac{19}{10}$ (C) 19 (D) $\frac{23}{2}$

29. If '+' means '–','–' means '+', '×' means '÷' and '÷' means '×', then the value of
$\frac{42 - 12 \times 3 + 8 \div 2 + 15}{8 \times 2 - 4 + 9 \div 3}$
यदि '+' का अर्थ '–','–' का अर्थ '+','×' का अर्थ '÷' और '÷' का अर्थ '×' होता हो, तो समीकरण $\frac{42 - 12 \times 3 + 8 \div 2 + 15}{8 \times 2 - 4 + 9 \div 3}$ का मान _____ होगा।
(A) $-\frac{5}{3}$ (B) $\frac{15}{19}$
(C) $-\frac{15}{19}$ (D) $\frac{5}{3}$

30. The value of $\left(18 \div 2 \text{ of } \frac{1}{4}\right) \times \left(\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}\right) \div \left(\frac{2}{3} \div \frac{3}{4} \text{ of } \frac{3}{4}\right)$ is :
$\left(18 \div 2 \text{ of } \frac{1}{4}\right) \times \left(\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}\right) \div \left(\frac{2}{3} \div \frac{3}{4} \text{ of } \frac{3}{4}\right)$ का मान बताइए ।
(A) $8\frac{5}{8}$ (B) $16\frac{7}{8}$
(C) $2\frac{7}{64}$ (D) $10\frac{2}{3}$

31. The value of $-\frac{5}{2} + \frac{3}{2} \div 6 \times \frac{1}{2}$ is equal to :
$-\frac{5}{2} + \frac{3}{2} \div 6 \times \frac{1}{2}$ का मान ज्ञात कीजिए।
(A) $-\frac{19}{8}$ (B) $-\frac{9}{8}$
(C) $-\frac{1}{3}$ (D) $-\frac{1}{12}$

32. Find the value of —/मान ज्ञात कीजिए —
$\frac{36 \div 42 \text{of} 6 \times 7 + 24 \times 6 \div 18 + 3 \div (2 - 6) - (4 + 3 \times 2) \div 8}{21 \div 3 \text{of} 7}$
(A) $7\frac{1}{2}$ (B) $\frac{1}{7}$
(C) $8\frac{1}{2}$ (D) 7

33. The value of $\frac{7 - [4 \times 3(2 - 2 \times 2 + 5) - 8] \div 5}{2 \div 2 \text{of} (4 + 4 \div 4 \text{of} 4)}$ is :
$\frac{7 - [4 \times 3(2 - 2 \times 2 + 5) - 8] \div 5}{2 \div 2 \text{of} (4 + 4 \div 4 \text{of} 4)}$ का मान ज्ञात कीजिए।
(A) 26 (B) $25\frac{1}{2}$ (C) $8\frac{1}{2}$ (D) 24

34. On Simplification $\frac{x^3 - y^3}{x\left[(x+y)^2 - 3xy\right]} \div \frac{y\left[(x-y)^2 + 3xy\right]}{x^3 + y^3} \times \frac{(x+y)^2 - (x-y)^2}{x^2 - y^2}$ is equal to :
$\frac{x^3 - y^3}{x\left[(x+y)^2 - 3xy\right]} \div \frac{y\left[(x-y)^2 + 3xy\right]}{x^3 + y^3} \times \frac{(x+y)^2 - (x-y)^2}{x^2 - y^2}$ का मान ज्ञात कीजिए।
(A) 4 (B) 1
(C) $\frac{1}{2}$ (D) $\frac{1}{4}$

35. If P = $\frac{x^4 - 8x}{x^2 - x^2 - 2x}$, Q = $\frac{x^2 + 2x + 1}{x^2 - 4x - 5}$ and R = $\frac{2x^2 + 4x + 8}{x - 5}$, then (P × Q) ÷ R is equal to :
यदि P = $\frac{x^4 - 8x}{x^2 - x^2 - 2x}$, Q = $\frac{x^2 + 2x + 1}{x^2 - 4x - 5}$ और R = $\frac{2x^2 + 4x + 8}{x - 5}$ हो, तो (P × Q) ÷ R का मान ज्ञात कीजिए।
(A) $\frac{1}{2}$ (B) 1
(C) 2 (D) 4

36. The value of $\dfrac{5\frac{1}{2}\div 3\frac{2}{3}\text{ of }\frac{1}{4}+\left(5\frac{1}{9}-7\frac{7}{8}\div 9\frac{9}{20}\right)\times\frac{9}{11}}{5\div 5\text{ of }\frac{1}{10}-10\times 10\div 20}$

is:

$\dfrac{5\frac{1}{2}\div 3\frac{2}{3}\text{ of }\frac{1}{4}+\left(5\frac{1}{9}-7\frac{7}{8}\div 9\frac{9}{20}\right)\times\frac{9}{11}}{5\div 5\text{ of }\frac{1}{10}-10\times 10\div 20}$ का मान बताएँ

(A) $1\frac{4}{5}$ (B) $1\frac{9}{10}$

(C) $3\frac{4}{5}$ (D) $9\frac{1}{2}$

37. The value of / का मान ज्ञात कीजिये।

$\dfrac{8\div[(8-3)\div\{(4\div 4\text{ of }8)+4-4\times 4\div 8\}-2]}{8\times 8\div 4-8\div 8\text{ of }2-7}$ is :

(A) $\frac{17}{8}$ (B) $\frac{8}{3}$

(C) $\frac{16}{170}$ (D) $\frac{2}{17}$

38. If P = $\dfrac{x^3+y^3}{(x-y)^2+3xy}$, Q = $\dfrac{(x+y)^2-3xy}{x^3-y^3}$ and R = $\dfrac{(x+y)^2-(x-y)^2}{x^2-y^2}$ then what is the value of (P ÷ Q) × R ?

यदि P = $\dfrac{x^3+y^3}{(x-y)^2+3xy}$, Q = $\dfrac{(x+y)^2-3xy}{x^3-y^3}$ और R = $\dfrac{(x+y)^2-(x-y)^2}{x^2-y^2}$ है, तो (P ÷ Q) × R का मान क्या है ?

(A) 2xy (B) $2(x^2+y^2)$

(C) x^2+y^2 (D) 4xy

39. The value of / का मान क्या है ?

$\dfrac{3\frac{2}{3}\div\frac{11}{30}\text{ of }\frac{2}{3}-\frac{1}{4}\text{ of }2\frac{1}{2}\div\frac{3}{5}\times 4\frac{4}{5}}{\frac{2}{5}\text{ of }7\frac{1}{2}\div\frac{3}{4}-\frac{3}{4}\times 1\frac{1}{2}\div 2\frac{1}{4}}$ is :

(A) $2\frac{2}{9}$ (B) $\frac{10}{21}$

(C) $2\frac{6}{7}$ (D) $3\frac{4}{7}$

40. The value of / का मान ज्ञात कीजिये।

$\frac{3}{5}\times 1\frac{7}{8}\div 1\frac{1}{3}\text{ of }\frac{3}{16}-\left(3\frac{1}{5}\div 4\frac{1}{2}\text{ of }5\frac{1}{3}\right)\times 2\frac{1}{2}+\frac{1}{2}+\frac{1}{8}\div\frac{1}{4}$

is :

(A) $4\frac{1}{3}$ (B) $5\frac{5}{6}$

(C) $5\frac{1}{6}$ (D) $4\frac{1}{8}$

41. The value of $-1+\frac{1}{4}\div\frac{1}{2}\times 2+5$ is :

$-1+\frac{1}{4}\div\frac{1}{2}\times 2+5$ का मान _____ है—

(A) 5 (B) 2

(C) $\frac{17}{4}$ (D) $-\frac{7}{2}$

42. If '+' means '–', '–' means '+', '×' means '÷' and '÷' means '×' then the value of $\dfrac{[(30\times 5)+(84\times 6)]\div 5}{\left[\frac{2}{3}\div 18\right]-[4\div 2]}$

is :

यदि '+' का अर्थ '–', '–' का अर्थ '+', '×' का अर्थ '÷' और '÷' का अर्थ '×' है, तो $\dfrac{[(30\times 5)+(84\times 6)]\div 5}{\left[\frac{2}{3}\div 18\right]-[4\div 2]}$ का मान बताइए।

(A) –2 (B) 2

(C) –1 (D) 1

43. Solve the following

निम्नलिखित समीकरण को हल करें :

113 × 87 = ?

(A) 10000 (B) 10026

(C) 9831 (D) 10169

44. Solve the following

निम्न समीकरण को हल करें :

$\frac{4}{3}\div\frac{1}{6}\times 2-1=?$

(A) –2 (B) 8

(C) 3 (D) 15

45. The value of $\frac{[54-(5\div 2)+8]+13}{48-4\div 3\times 8-2}$ is :

$\frac{[54-(5\div 2)+8]+13}{48-4\div 3\times 8-2}$ का मान ज्ञात कीजिये।

(A) $\frac{89}{127}$ (B) $\frac{89}{106}$

(C) $\frac{141}{127}$ (D) $\frac{141}{106}$

46. The value of 3 – (9 – 3 × 8 ÷ 2) is
3 – (9 – 3 × 8 ÷ 2) का मान ज्ञात कीजिये।
(A) –21 (B) 6
(C) 0 (D) 21/2

47. The value of / का मान ज्ञात कीजिये।

$1\frac{1}{8}\div\left(4\frac{1}{4}\div\frac{3}{5}\text{of}8\frac{1}{2}\right)-\frac{2}{5}\times 1\frac{1}{3}\div\frac{4}{5}\text{of}\,1\frac{2}{3}+\frac{11}{20}$ is

(A) $1\frac{1}{2}$ (B) $1\frac{1}{4}$

(C) $3\frac{1}{8}$ (D) $3\frac{1}{2}$

48. Solve the following expression.
निम्नलिखित व्यंजक का मान क्या है ?
5.6 – {2 +0.6 of (2.1 – 2.6 × 1.12)}
(A) 4.0871 (B) 4.0872
(C) 7.7113 (D) 7.7112

49. The value of 1800 ÷ 20 × {(12 – 6) + (24 – 12)} is :
1800 ÷ 20 × {(12 – 6) + (24 – 12)} का मान क्या होगा ?
(A) 1720 (B) 1620
(C) 840 (D) 2720

50. Solve the following expression.
निम्नलिखित व्यंजक को हल करें।
11 + 11 × 11 – 11 ÷ 11
(A) 131
(B) 11
(C) 121
(D) 22

51. The value of (26 – 13 × 2) ÷ 2 + 1 is
(26 – 13 × 2) ÷ 2 + 1 का मान ज्ञात कीजिये।

(A) $\frac{26}{3}$
(B) 0
(C) 1
(D) 14

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Solution

1. (B) $\frac{12}{\sqrt{5}+\sqrt{3}}+\frac{18}{\sqrt{5}-\sqrt{3}}$

$\frac{12}{\sqrt{5}+\sqrt{3}}\times\frac{(\sqrt{5}-\sqrt{3})}{(\sqrt{5}-\sqrt{3})}+\frac{18}{\sqrt{5}-\sqrt{3}}\times\frac{(\sqrt{5}+\sqrt{3})}{(\sqrt{5}+\sqrt{3})}$

$6(\sqrt{5}-\sqrt{3})+9(\sqrt{5}+\sqrt{3})$

$6\sqrt{5}-6\sqrt{3}+9\sqrt{5}+9\sqrt{3}$

$15\sqrt{5}-3\sqrt{3}$

$= 3(5\sqrt{5}+\sqrt{3})$

2. (D)

3. (A)

4. (A) Binary 1101111

From option

2	111	1
2	55	1
2	27	1
2	13	1
2	6	0
2	3	1
	1	1

5. (C) 9991×10009

$\Rightarrow (10000-9)\,.\,(10000+9)$

$\Rightarrow (10000)^2-(9)^2$

$\Rightarrow 100000000-81$

$= 99999919$

6. (D)

2	101	
2	50	1
2	25	0
2	12	1
2	6	0
2	3	0
	1	1

$101 = 1100101$

7. (C) 9997×10003

$= (10000-3)(10000+3)$

$= (10000)^2-9$

$= 100000000-9 = 99999991$

8. (D)

2	99	
2	49	1
2	24	1
2	12	0
2	6	0
2	3	0
	1	1

$= 1100011$

9. (D) $\frac{21.6}{3.6}\times 2+0.25\times\frac{16}{4}-6$

$= 12 + 1 - 6 = 7$

10. (C) $15.2 + 5.8 \div 2.9 \times 2 - 3.5 \times 2 \div 0.5$

$15.2+\frac{5.8}{2.9}\times 2-3.5\times\frac{2}{0.5}$

$15.2 + 4 - 3.5 \times 4$

$15.2 + 4 - 14$

$19.2 - 14 = 5.2$

11. (C) $\frac{39}{4}\div\left[\frac{13}{6}\div\left\{\frac{13}{3}-\left(\frac{13}{4}\right)\right\}\right]$

$= \frac{39}{4}\div\left[\frac{13}{6}\times\frac{12}{13}\right]$

$= \frac{39}{4}\times\frac{1}{2}=\frac{39}{8}$

12. (D) $3.8+\left(\frac{8.2}{4.1}\times 2\right)-4\times\frac{3}{1.2}$

$= 3.8 + 4 - 10$

$= 7.8 - 10 = -2.2$

13. (B) $7.5 + (5.4 \div 4.5 \times 2) - 8 \times 4 \div 3.2$

$7.5+\left(\frac{5.4}{4.5}\times 2\right)-\frac{8\times 4}{3.2}$

$7.5+\frac{6}{5}\times 2-10$

$\frac{15}{2}+\frac{12}{5}-10$

$= 7.5 + 2.4 - 10$

$= 9.9 - 10 = -0.1$

14. (C) $108 \div 36 \times 4 + 2.5 \times 4 \div 0.5 - 10$

$\frac{108}{36}\times 4+2.5\times 4\div 0.5-10$

$12+\frac{2.5\times 4}{0.5}-10$

$= 12 + 20 - 10$

$= 32 - 10$

$= 22$

15. (D) $2.8 + (5.2 \div 1.3 \times 2) - 6 \times 3 \div 8 + 2$

$2.8+\left(\frac{5.2}{1.3}\times 2\right)-6\times\frac{3}{8}+2$

$2.8 + .8 - \frac{9}{4} + 2$

$12.8 - 2.25 = 10.55$

16. (B) $7.2 + \left(\frac{8.4}{0.12} \times 0.2\right) - 5 \times \frac{3}{0.05} + 3$

$7.2 + (70 \times 0.2) - \frac{5 \times 3}{5} \times 100 + 3$

$= 7.2 + 14 - 300 + 3$

$= 24.2 - 300 = -275.8$

17. (B) $5.8 + \frac{7.4}{3.7} \times 5 - 6 \times \frac{2}{2.5}$

$5.8 + 10 - \frac{6 \times 2 \times 2}{5}$

$= 15.8 - \frac{24}{5}$

$= 15.8 - 4.8 = 11$

18. (C) Use BODMAS

19. (D) USE BODMAS

20. (D)

21. (C)

22. (A) $4.5 - \left(\frac{3.2}{0.8} \times 5\right) + 3 \times \frac{4}{6}$

$4.5 - 20 + 2$

$= -13.5$

23. (A) $3.8 - \left(\frac{4.2}{0.7} \times 3\right) + 5 \times 2 \times 10/5$

$3.8 - 18 + 20$

$3.8 + 2 = 5.8$

24. (C) $\left(5 + \frac{3}{5} \times 5\right) \div \left(4 \times \frac{4}{16} + \frac{4}{4} \times 4\right) \times \left(\frac{3}{18}\right)$

$= 8 \div (1 + 4) \times \frac{3}{18} \Rightarrow 8 \div \frac{15}{18}$

$8 \times \frac{18}{15} = \frac{8 \times 6}{5}$

$= \frac{48}{5} = 9\frac{3}{5}$

25. (D) $\frac{9}{15} \times \left(\frac{2}{3}\right) \div \left(\frac{9}{16}\right) \times \left(\frac{5}{4} \div \frac{5}{2} \times \frac{2}{5} \times \frac{4}{5}\right)$

$\frac{9}{15} \times \frac{2}{3} \div \left(\frac{9}{16}\right) \times \left(\frac{5}{4} \times \frac{2}{5} \times \frac{8}{25}\right)$

$= \frac{9}{15} \times \frac{2}{3} \div \left(\frac{9}{16} \times \frac{5}{4} \times \frac{2}{5} \times \frac{8}{25}\right)$

$= \frac{9}{15} \times \frac{2}{3} \times \frac{100}{9} \rightarrow \frac{40}{9}$

26. (A) $16 \div 4 \times 4 \times [3 \div 4 \times \{4 \times 3 \div (6)\}] \div (2 \div 4 \times 8)$

$\frac{16}{16} \times [3 \div 4 \times 2] \div \left(\frac{2}{32}\right)$

$1 \times \left[\frac{3}{8}\right] \times \frac{32}{2} = 6$

27. (D) $\frac{2 \times 3}{6} \times 2 \div \left(4 + \frac{4 \times 4}{16} - \frac{4}{4} \times 4\right)$

$1 \times 2 \div (4 + 1 - 4)$

$1 \times \frac{2}{1} = 2$

28. (B) $5 \div 5$ of $5 \times 2 + 2 \div 2$ of $2 \times 5 - (5 - 2) \div 6 \times 2$

$5 \div 5 \times 5 \times 2 + 2 \div 2 \times 2 \times 5 - 3 \div 6 \times 2$

$5 \div 25 \times 2 + 2 \div 4 \times 5 - 3 \div 6 \times 2$

$\frac{1}{5} \times 2 + \frac{1}{2} \times 5 - \frac{1}{2} \times 2$

$= \frac{2}{5} + \frac{5}{2} - 1$

$= \frac{4 + 25 - 10}{10} = \frac{19}{10}$

29. (C) $\frac{42 - 12 \times 3 + 8 \div 2 + 15}{8 \times 2 - 4 + 9 \div 3}$

Change signs

$= \frac{42 + 12 \div 3 - 8 \times 2 - 15}{8 \div 2 + 4 - 9 \times 3}$

$= \frac{42 + 4 - 16 - 15}{4 + 4 - 27} = -\frac{15}{19}$

30. (B) $\left(18 \div 2 \text{ of } \frac{1}{4}\right) \times \left(\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}\right) \div \left(\frac{2}{3} \div \frac{3}{4} \text{ of } \frac{3}{4}\right)$

$= 18 \times 2 \times \left(\frac{2}{3} \times \frac{4}{3} \times \frac{5}{8}\right) \div \left(\frac{2}{3} \times \frac{4 \times 4}{3 \times 3}\right)$

$= 36 \times \frac{5}{9} \times \frac{3 \times 3 \times 3}{2 \times 4 \times 4} = \frac{135}{8} = 16\frac{7}{8}$

31. (A) $-\frac{5}{2} + \frac{3}{2} \div 6 \times \frac{1}{2}$

$= -\frac{5}{2} + \frac{3}{2 \times 6} \times \frac{1}{2} = \frac{5}{2} + \frac{1}{8}$

$= \frac{-20 + 1}{8} = \frac{-19}{8}$

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32. (D)

$$\frac{36 \div 42 \text{ of } 6 \times 7 + 24 \times 6 \div 18 + 3 \div (2-6) - (4+3\times 2) \div 8}{21 \div 3 \text{ of } 7}$$

$$= \frac{36}{42\times 6} \times 7 + 24 \times \frac{6}{18} - \frac{3}{4} - \frac{10}{8}$$

$$= 1 + 8 - \frac{3}{4} - \frac{5}{4} = 9 - 2 = 7$$

33. (B) $\dfrac{7-\left[4+3(2-2\times 2+5)-8\right]\div 5}{2\div 2 \text{ of } \left(4+4\div 4 \text{ of } 4\right)}$

$$= \frac{7-\left[4+3(2-4+5)-8\right]\div 5}{2\div 2 \text{ of } \left(4+\frac{1}{4}\right)}$$

$$\frac{7-\left[4+3(3)-8\right]\div 5}{2\div 2\times \frac{17}{4}}$$

$$= \frac{7-[5]\div 5}{2\times \frac{2}{17}} = \frac{7-1}{\frac{4}{17}}$$

$$= \frac{6\times 17}{4} = \frac{51}{2} = 25\frac{1}{2}$$

34. (A) $\dfrac{x^3-y^3}{x\left[(x+y)^2-3xy\right]} \div \dfrac{y\left[(x-y)^2+3xy\right]}{x^3+y^3} \times \dfrac{(x+y)^2-(x-y)^2}{x^2-y^2}$

$$= \frac{x^3-y^3}{x\left(x^2+y^2-xy\right)} \times \frac{x^3+y^3}{y\left(x^2+y^2+xy\right)} \times \frac{4xy}{x^2-y^2}$$

$$= \frac{4(x+y)\left(x^2-xy+y^2\right)\times(x-y)\left(x^2+y^2+xy\right)}{\left(x^2+y^2-xy\right)\left(x^2+y^2+xy\right)\times\left(x^2-y^2\right)}$$

$$= 4$$

35. (A) $P = \dfrac{x^4-8x}{x^3-x^2-2x}$; $Q = \dfrac{x^2+2x+1}{x^2-4x-5}$; $R = \dfrac{2x^2+4x+8}{x-5}$

$$(P \times Q) \div R = \left[\frac{x^4-8x}{x^3-x^2-2x}\times\frac{x^2+2x+1}{x^2-4x-5}\right]\times \frac{x-5}{2x^2+4x+8}$$

$$= \frac{(x-2)\left(x^2+4+2x\right)}{\left(x^2-x-2\right)}\times\frac{(x+1)^2}{\left(x^2-4x-5\right)}\times\frac{x-5}{2\left(x^2+2x+4\right)}$$

$$= \frac{(x-2)}{(x+1)(x-2)}\times\frac{(x+1)^2}{(x+1)(x-5)}\times\frac{(x-5)}{2} = \frac{1}{2}$$

36. (B) $\dfrac{5\frac{1}{2}\div 3\frac{2}{3} \text{ of } \frac{1}{4} + \left(5\frac{1}{9} - 7\frac{7}{8}\div 9\frac{9}{20}\right)\times\frac{9}{11}}{5\div 5 \text{ of } \frac{1}{10} - 10\times 10\div 20}$

$$= \frac{\frac{11}{2}\div\frac{11\times 1}{3\times 4} + \left[\frac{46}{9} - \frac{63}{8}\times\frac{20}{189}\right]\times\frac{9}{11}}{10-5}$$

$$= \frac{1}{5}\left[\frac{11}{2}\times\frac{12}{11} + \left\{\frac{46}{9}-\frac{5}{6}\right\}\times\frac{9}{11}\right]$$

$$= \frac{1}{5}\left[6+\frac{77}{18}\times\frac{9}{11}\right] = \frac{1}{5}\left[6+\frac{7}{2}\right]$$

$$= \frac{1}{5}\left[\frac{19}{2}\right] = \frac{19}{10} = 1\frac{9}{10}$$

37. (B) $\dfrac{8\div[(8-3)\div\{(4\div 4 \text{ of } 8)+4-4\times 4\div 8\}-2]}{8\times 8\div 4 - 8\div 8 \text{ of } 2 - 7}$

$$= \frac{8\times\frac{17}{6}}{16-\frac{1}{2}-\frac{1}{7}}$$

$$= \frac{68}{3}\times\frac{2}{17} = \frac{8}{3}$$

38. (D) $P = \dfrac{x^3+y^3}{(x-y)^2+3xy}, Q = \dfrac{(x+y)^2-3xy}{x^3-y^3}$

$$R = \frac{(x+y)^2-(x-y)^2}{x^2-y^2}$$

$$(P\div Q)\times R = \frac{x^3+y^3}{(x-y)^2+3xy}\times\frac{x^3-y^3}{(x+y)^2-3xy}$$

$$\times\frac{(x+y)^2-(x-y)^2}{x^2-y^2}$$

$$= \frac{(x+y)(x^2+y^2-2xy)}{(x^2+y^2+xy)}\times\frac{(x-y)(x^2+y^2+xy)}{(x^2+y^2-xy)}$$

$$\times\frac{4xy}{(x-y)(x+y)} = 4xy$$

39. (C) $\dfrac{3\frac{2}{3}\div\frac{11}{30}\text{ of }\frac{2}{3}-\frac{1}{4}\text{ of }2\frac{1}{2}\div\frac{3}{5}\times4\frac{4}{5}}{\frac{2}{5}\text{ of }7\frac{1}{2}\div\frac{3}{4}-\frac{3}{4}\times1\frac{1}{2}\div2\frac{1}{4}}$

$= \dfrac{\frac{11}{3}\times\frac{30\times3}{11\times2}-\frac{1}{4}\times\frac{5}{2}\times\frac{5}{3}\times\frac{24}{5}}{\frac{2\times15}{5\times2}\times\frac{4}{3}-\frac{3}{4}\times\frac{3}{2}\times\frac{4}{9}}$

$= \dfrac{15-5}{4-\frac{1}{2}}=\dfrac{10}{\frac{7}{2}} = \dfrac{20}{7} = 2\dfrac{6}{7}$

40. (C) $\dfrac{3}{5}\times1\dfrac{7}{8}\div1\dfrac{1}{3}\text{ of }\dfrac{3}{16}-\left(3\dfrac{1}{5}\div4\dfrac{1}{2}\text{ of }5\dfrac{1}{3}\right)\times2\dfrac{1}{2}+\dfrac{1}{2}+\dfrac{1}{8}\div\dfrac{1}{4}$

$= \dfrac{3}{5}\times\dfrac{15}{8}\times4-\left(\dfrac{16}{5}\times\dfrac{1}{24}\right)\dfrac{5}{2}+\dfrac{1}{2}+\dfrac{1}{2}$

$= \dfrac{9}{2}-\dfrac{1}{3}+1$

$= \dfrac{31}{6} = 5\dfrac{1}{6}$

41. (A) Value of $-1+\dfrac{1}{4}\div\dfrac{1}{2}\times2+5$

$= -1+1+5 = 5$

42. (A) $\dfrac{[(30\div5)-(84\div6)]\times5}{\left[\frac{2}{3}\times18\right]+[4\times2]}$

$\dfrac{[6-14]\times5}{12+8} = \dfrac{-40}{20} = -2$

43. (C) $113\times87 = (100+13)\times(100-13)$
$= (100^2-13^2) = 10000-169 = 9831$

44. (D) $\dfrac{4}{3}\div\dfrac{1}{6}\times2-1$

$= \dfrac{4}{3}\times6\times2-1 = 15$

45. (D) $\dfrac{[54-(5\div2)\times8]+13}{48-4\div3\times8-2} = \dfrac{47}{46-\frac{32}{3}} = \dfrac{141}{106}$

46. (B) $3-(9-3\times8\div2) = 6$

47. (C) $1\dfrac{1}{8}\div\left(4\dfrac{1}{4}\div\dfrac{3}{5}\text{ of }8\dfrac{1}{2}\right)-\dfrac{2}{5}\times1\dfrac{1}{3}\div\dfrac{4}{5}\text{ of }1\dfrac{2}{3}+\dfrac{11}{20}$

$= \dfrac{9}{8}\times\dfrac{6}{5}-\dfrac{2}{5}+\dfrac{11}{20}$

$= \dfrac{27}{20}-\dfrac{2}{5}+\dfrac{11}{20}$

$\Rightarrow \dfrac{27-8+11}{20} = 1\dfrac{1}{2}$

48. (B) $5.6-\{2+0.6\text{ of }(2.1-2.6\times1.12)\}$
$= 5.6-\{2-4.872\}$
$= 4.0872$

49. (B) $1800\div20\times\{(12-6)+(24-12)\}$

$\Rightarrow \dfrac{1800}{20}\times\{6+12\}$

$\Rightarrow 90\times18 = 1620$

50. (A) $11+11\times11-11\div11$
$= 11+121-1 = 131$

51. (C) $(26-13\times2)\div2+1$
$0\div2+1 = 1$

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Simplification (CDS — 2022-2021)

CDS EXAM Paper 2022 -I

1. What is the value of the following?

$$\frac{(5.4)^3 - 0.064}{(5.4)^2 + 2.16 + 0.16}$$

$\frac{(5.4)^3 - 0.064}{(5.4)^2 + 2.16 + 0.16}$ का मान क्या है ?

(A) 4 (B) 4.4
(C) 5 (D) 5.4

2. What is the value of the following?

$$\frac{1}{5\sqrt{4}+4\sqrt{5}} + \frac{1}{6\sqrt{5}+5\sqrt{6}} + \frac{1}{7\sqrt{6}+6\sqrt{7}} + \frac{1}{8\sqrt{7}+7\sqrt{8}} + \frac{1}{9\sqrt{8}+8\sqrt{9}}$$

$\frac{1}{5\sqrt{4}+4\sqrt{5}} + \frac{1}{6\sqrt{5}+5\sqrt{6}} + \frac{1}{7\sqrt{6}+6\sqrt{7}} + \frac{1}{8\sqrt{7}+7\sqrt{8}} + \frac{1}{9\sqrt{8}+8\sqrt{9}}$ का मान क्या है ?

(A) $\frac{1}{\sqrt{6}}$ (B) $\frac{1}{2}$
(C) 1 (D) $\frac{1}{6}$

3. If $x = 9999$, then what is the value of the following?

$$\frac{4x^3 - x}{(2x+1)(6x-3)}$$

यदि x = 9999, तो $\frac{4x^3 - x}{(2x+1)(6x-3)}$ का मान क्या है ?

(A) 1111 (B) 2222
(C) 3333 (D) 6666

4. What is $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \ldots + \frac{1}{\sqrt{2020}+\sqrt{2021}}$ equal to?/ किसके बराबर है ?

(A) $\sqrt{2020}+1$ (B) $\sqrt{2021}+1$
(C) $\sqrt{2021}+\sqrt{2021}-1$ (D) $\sqrt{2021}-1$

CDS EXAM PAPER 2021 -II

5. What is the square root of $23 - 4\sqrt{15}$?

$23 - 4\sqrt{15}$ का वर्गमूल क्या है ?

(A) $\sqrt{6} - 3\sqrt{2}$ (B) $7 - 3\sqrt{5}$
(C) $\sqrt{3} - 2\sqrt{5}$ (D) $\sqrt{5} - 4\sqrt{3}$

Solution

1. (C) $\dfrac{(5.4)^3-(.4)^3}{(5.4)^2+5.4\times.4+(.4)^2}$

$a^3 - b^3 = (a-b)(a^2+b^2+ab)$

$\Rightarrow \quad a-b = \dfrac{a^3-b^3}{a^2+b^2+ab}$

$5.4 - 0.4 = 5$

2. (D) $\dfrac{1}{5\sqrt{4}+4\sqrt{5}}+\dfrac{1}{5\sqrt{6}+6\sqrt{5}}+\dfrac{1}{6\sqrt{7}+7\sqrt{6}}$

$$+\frac{1}{7\sqrt{8}+8\sqrt{7}}+\frac{1}{8\sqrt{9}+9\sqrt{8}}$$

$$\Rightarrow \frac{1}{\sqrt{20}\left(\sqrt{5}+\sqrt{4}\right)}+\frac{1}{\sqrt{30}\left(\sqrt{6}+\sqrt{5}\right)}$$

$$+\frac{1}{\sqrt{42}\left(\sqrt{7}+\sqrt{6}\right)}+\frac{1}{\sqrt{56}\left(\sqrt{8}+\sqrt{7}\right)}+\frac{1}{\sqrt{72}\left(\sqrt{9}+\sqrt{8}\right)}$$

$$\Rightarrow \frac{\sqrt{5}-\sqrt{4}}{\sqrt{20}}+\frac{\sqrt{6}+\sqrt{5}}{\sqrt{30}}+\frac{\sqrt{7}-\sqrt{6}}{\sqrt{42}}$$

$$+\frac{\sqrt{8}-\sqrt{7}}{\sqrt{56}}+\frac{\sqrt{9}-\sqrt{8}}{\sqrt{72}}$$

$$\Rightarrow \frac{1}{\sqrt{4}}-\frac{1}{\sqrt{5}}+\frac{1}{\sqrt{5}}-\frac{1}{\sqrt{6}}+\frac{1}{\sqrt{6}}-\frac{1}{\sqrt{7}}+\frac{1}{\sqrt{7}}$$

$$-\frac{1}{\sqrt{8}}+\frac{1}{\sqrt{8}}-\frac{1}{\sqrt{9}}$$

$$\Rightarrow \frac{1}{2}-\frac{1}{3}=\frac{1}{6}$$

3. (C) $x = 9999$

$$\Rightarrow \frac{4x^3-x}{(2x-1)(6x-3)}$$

$$\Rightarrow \frac{x\left(4x^2-1\right)}{(2x+1)3(2x-1)}$$

$$\Rightarrow \frac{x(2x-1)(2x+1)}{3(2x+1)(2x-1)}$$

$$\Rightarrow \frac{x}{3}=\frac{9999}{3}=3333$$

5. (D)

$$\Rightarrow \frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\ldots$$

$$+\frac{1}{\sqrt{2020}+\sqrt{2021}}$$

$$\Rightarrow \sqrt{2}-1+\sqrt{3}-\sqrt{2}+\sqrt{4}-\sqrt{3}+\ldots$$

$$+\sqrt{2021}-\sqrt{2020}$$

$$\Rightarrow \sqrt{2021}-1$$

5. (C) $\sqrt{23-4\sqrt{15}}$

$$=\sqrt{23-2\times2\sqrt{5}\times\sqrt{3}}$$

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

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

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Simplification (CDS — 2021-2010)

CDS 2021_I

1. What is the value of x, if $\frac{b+\sqrt{b^2-2bx}}{b-\sqrt{b^2-2bx}} = a$?

यदि $\frac{b+\sqrt{b^2-2bx}}{b-\sqrt{b^2-2bx}} = a$ है, तो x का मान क्या है ?

(A) $\frac{ab}{(a+b)}$ (B) $\frac{2ab}{(a+1)}$

(C) $\frac{2ab}{(a+1)^2}$ (D) $\frac{ab}{(a+1)^2}$

2. The expression $\frac{(x^3-1)(x^2-9x+14)}{(x^2+x+1)(x^2-8x+7)}$ simplifies to :

सरलीकरण के उपरांत व्यंजक $\frac{(x^3-1)(x^2-9x+14)}{(x^2+x+1)(x^2-8x+7)}$ किसके बराबर होगा ?

(A) (x – 1) (B) (x – 2)
(C) (x – 7) (D) (x + 2)

3. What should be added to $\frac{1}{(x-2)(x-4)}$ to get $\frac{2x-5}{(x^2-5x+6)(x-4)}$?

$\frac{1}{(x-2)(x-4)}$ में क्या जोड़ा जाना चाहिए ताकि $\frac{2x-5}{(x^2-5x+6)(x-4)}$ प्राप्त हो ?

(A) $\frac{1}{(x^2-7x+12)}$

(B) $\frac{1}{(x^2+7x+12)}$

(C) $\frac{1}{(x^2-7x-12)}$

(D) $\frac{1}{(x^2+7x-12)}$

CDS 2020_II

4. If $x^m = \sqrt[14]{x\sqrt{x\sqrt{x}}}$ then find the value of m.

यदि $x^m = \sqrt[14]{x\sqrt{x\sqrt{x}}}$ है, तो m का मान क्या है ?

(A) $\frac{1}{8}$ (B) $\frac{1}{4}$

(C) $\frac{3}{4}$ (D) $\frac{7}{4}$

5. $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\ldots\frac{1}{\sqrt{99}+\sqrt{100}} = ?$

(A) 1 (B) 5
(C) 9 (D) 10

CDS 2020_I

6. If $x = \sqrt{2}$, $y = 3\sqrt{3}$, $z = 6\sqrt{6}$, then which of the following is true/ निम्नलिखित में से क्या सत्य है ?

(A) $y < x < z$
(B) $z < x < y$
(C) $z < y < x$
(D) $x < y < z$

7. If n is a positive integer, when $x^{\sqrt{x}} = \sqrt[x]{x^x}$ then what is the set of solution?

यदि n एक धनात्मक पूर्णांक है, तो समीकरण $x^{\sqrt{x}} = \sqrt[x]{x^x}$ के हलों का समुच्चय, निम्नलिखित में से कौनसा है ?

(A) $\{1, n^2\}$ (B) $\{1, \sqrt{n}\}$
(C) $\{1, n^{3/2}\}$ (D) $\{n, n^2\}$

CDS 2019_II

8. If $a = \sqrt{7+4\sqrt{3}}$, then what is the value of $a + \frac{1}{a}$

यदि $a = \sqrt{7+4\sqrt{3}}$, तब $a + \frac{1}{a}$ का मान बताओ।

(A) 2 (B) 3
(C) 4 (D) 7

9. What is square root of $16 + 6\sqrt{7}$

$16 + 6\sqrt{7}$ का वर्गमूल बताओ।

(A) $4 + \sqrt{7}$
(B) $4 - \sqrt{7}$
(C) $3 + \sqrt{7}$
(D) $3 - \sqrt{7}$

10. If a, b & c are positive integer & $\cfrac{1}{a+\cfrac{1}{b+\cfrac{1}{c+\frac{1}{2}}}} = \frac{16}{23}$

then the average of a, b & c.

यदि a, b और c धनात्मक पूर्णांक हैं और $\cfrac{1}{a+\cfrac{1}{b+\cfrac{1}{c+\frac{1}{2}}}} = \frac{16}{23}$

तब a, b और c का औसत बताओ।

(A) 1 (B) 2

(C) 1.33 (D) 2.33

CDS 2019_I

11. If $x = \frac{4\sqrt{6}}{\sqrt{2}+\sqrt{3}}$, then $\frac{x+2\sqrt{2}}{x-2\sqrt{2}} + \frac{x+2\sqrt{3}}{x-2\sqrt{3}} = ?$

यदि $x = \frac{4\sqrt{6}}{\sqrt{2}+\sqrt{3}}$, तब $\frac{x+2\sqrt{2}}{x-2\sqrt{2}} + \frac{x+2\sqrt{3}}{x-2\sqrt{3}} = ?$

(A) 1 (B) $\sqrt{2}$

(C) $\sqrt{3}$ (D) 2

12. If $\frac{36}{11} = 3 + \cfrac{1}{x+\cfrac{1}{y+\frac{1}{z}}}$, where x, y and z are natural numbers, then what is the value of (x + y + z)

यदि $\frac{36}{11} = 3 + \cfrac{1}{x+\cfrac{1}{y+\frac{1}{z}}}$, जहां, x, y और z प्राकृतिक संख्या है,

तब (x + y + z) का मान बताओ।

(A) 6 (B) 7

(C) 8 (D) 9

CDS 2018_I

13. What is the value of $\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}} - \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$

$\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}} - \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$ का मान क्या है ?

(A) $-2\sqrt{15}$ (B) $2\sqrt{15}$

(C) $\sqrt{15}$ (D) $-\sqrt{15}$

CDS 2017_II

14. The value of $\sqrt{1+\sqrt{1+\sqrt{1+...}}}$

$\sqrt{1+\sqrt{1+\sqrt{1+...}}}$ का मान ज्ञात करें।

(A) Equals to 1

(B) Lies between 0 and 1

(C) Lies between 1 and 2

(D) is greater than 2

15. What is the square root of $\frac{(0.35)^2+0.70+1}{2.25} + 0.19$?

$\frac{(0.35)^2+0.70+1}{2.25} + 0.19$ का वर्गमूल किसके बराबर है ?

(A) 1 (B) 2

(C) 3 (D) 4

CDS 2017_I

16. If $x = \frac{\sqrt{a+b}-\sqrt{a-b}}{\sqrt{a+b}+\sqrt{a-b}}$, then what is $bx^2 - 2ax + b$ equal to $(b \neq a)$?

यदि $x = \frac{\sqrt{a+b}-\sqrt{a-b}}{\sqrt{a+b}+\sqrt{a-b}}$, तो $bx^2 - 2ax + b$ किसके बराबर है $(b \neq a)$?

(A) 0 (B) 1

(C) ab (D) 2ab

17. What is the value of

$\frac{(443+547)^2+(443-547)^2}{443\times443+547\times547}$?

का मान क्या है ?

(A) 0 (B) 1

(C) 2 (D) 3

18. The values of x which satisfy the equation $5^{1+x} + 5^{1-x} = 26$ are

समीकरण $5^{1+x} + 5^{1-x} = 26$ को सन्तुष्ट करने वाले x के मान कौन से हैं ?

(A) −1, 1 (B) 0, 1

(C) 1, 2 (D) −1, 0

19. What is the value of $\sqrt[3]{4\frac{12}{125}}$?

$\sqrt[3]{4\frac{12}{125}}$ का मान क्या है ?

(A) $1\frac{3}{5}$ (B) $1\frac{2}{5}$ (C) $1\frac{4}{5}$ (D) $2\frac{2}{5}$

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CDS 2016_II

20. The value of the expressions $\frac{(243+647)^2+(243-647)^2}{243\times243+647\times647}$ is equal to

व्यंजक $\frac{(243+647)^2+(243-647)^2}{243\times243+647\times647}$ का मान किसके बराबर हैं ?

(A) 0 (B) 1
(C) 2 (D) 3

21. If $\sqrt{\frac{x}{y}}=\frac{10}{3}-\sqrt{\frac{y}{x}}$ and x – y = 8 then the value of xy is equal to.

यदि $\sqrt{\frac{x}{y}}=\frac{10}{3}-\sqrt{\frac{y}{x}}$ और x – y = 8 हैं, तो का xy का मान किसके बराबर हैं ?

(A) 36 (B) 24
(C) 16 (D) 9

22. If m and n distinct natural numbers, then which of the following is/are integer (s)?
यदि m और n भिन्न धन पूर्णांक हैं, तो निम्नलिखित में से कौन-सा/से पूर्णांक हैं ?

i. $\frac{m}{n}+\frac{n}{m}$

ii. $mn\left(\frac{m}{n}+\frac{n}{m}\right)(m^2+n^2)$

iii. $\frac{mn}{m^2+n^2}$

Select the correct answer using the codes given below,
नीचे दिए गए कूट का प्रयोग कर सही उत्तर चुनिए।

(A) i and ii/ i और ii (B) Only ii/ केवल ii
(C) ii and iii / ii और iii (D) Only iii/ केवल iii

23. If $\frac{a}{b}=\frac{b}{c}=\frac{c}{d}$ then which of the following is/are correct ?

यदि $\frac{a}{b}=\frac{b}{c}=\frac{c}{d}$ हैं, तो निम्नलिखित में से कौन-सा/से सही हैं ?

i. $\frac{b^3+c^3+d^3}{a^3+b^3+c^3}=\frac{d}{c}$

ii. $\frac{a^3+b^3+c^3}{b^3+c^3+d^3}=\frac{a}{d}$

Select the correct answer using the codes given below
नीचे दिए गए कूट का प्रयोग कर सही उत्तर चुनिए।

(A) Only i / केवल i
(B) Only ii /केवल ii
(C) Both i and ii/i और ii दोनों
(D) Neither i nor ii/ न तो i और न ही ii

24. $7^{10}-5^{10}$ is divisible by
$7^{10}-5^{10}$ किससे विभाज्य हैं ?

(A) 0 (B) 7
(C) 10 (D) 11

CDS 2016_I

25. If $x=2^{1/3}+2^{-1/3}$ then the value of $2x^3-6x-5$ is equal to.
यदि $x=2^{1/3}+2^{-1/3}$ हैं, तो $2x^3-6x-5$ का मान किसके बराबर हैं ?

(A) 0
(B) 1
(C) 2
(D) 3

26. Let m be a non-zero integer and n be a positive integer. Let R be the remainder obtained on dividing the polynomial x^n+m^n by (x – m) then.
मान लीजिए m एक शुन्येत्तय पूर्णांक और n एक धनात्मक पूर्णांक हैं। मान लीजिए R, बहुपद x^n+m^n को (x – m) से विभाजित करने पर प्राप्त शेषफल हैं। तब,

(A) R is a non-zero even integer
R एक शून्येत्तर सम पूर्णांक हैं
(B) R is odd, if m is odd /R विषम हैं, यदि m विषम हैं
(C) $R=s^2$ for some integer s, if n is even
किसी पूर्णांक s के लिए $R=s^2$ हैं, यदि n सम हैं
(D) $R=t^3$ for some integer t, if 3 divides n
किसी पूर्णांक t के लिए $R=t^3$ हैं, यदि 3,n को विभाजित करता हैं

27. If $4^x2^y=128$ and $3^{3x}2^{2y}-9^{xy}=0$ then the value of x + y can be equal to.
यदि $4^x2^y=128$ और $3^{3x}2^{2y}-9^{xy}=0$ है तो x + y का किसके बराबर हो सकता हैं ?

(A) 7
(B) 5
(C) 3
(D) 1

28. If $x = \frac{\sqrt{a+2b}+\sqrt{a-2b}}{\sqrt{a+2b}-\sqrt{a-2b}}$ then $bx^2 - ax + b$ is equal to (given than $b \neq 0$)

यदि $x = \frac{\sqrt{a+2b}+\sqrt{a-2b}}{\sqrt{a+2b}-\sqrt{a-2b}}$ है तो $bx^2 - ax + b$ किसके बराबर हैं ? (दिया गया हैं कि $b \neq 0$)

(A) 0 (B) 1
(C) ab (D) 2ab

29. If $a^3 = 117 + b^3$ and $a = 3 + b$ then the value of $a + b$ is (given that $a > 0$ and $b > 0$)

यदि $a^3 = 117 + b^3$ और $a = 3 + b$ है, तो $a + b$ का मान क्या हैं ? (दिया गया हैं कि $a > 0$ और $b > 0$)

(A) 7 (B) 9
(C) 11 (D) 13

CDS 2015_II

30. If $x = \sqrt{3} + \sqrt{2}$, then the value of $x^3 + x + \frac{1}{3} + \frac{1}{x^3}$ is.

यदि $x = \sqrt{3} + \sqrt{2}$, तो $x^3 + x + \frac{1}{3} + \frac{1}{x^3}$ का मान क्या हैं ?

(A) $10\sqrt{3}$ (B) $20\sqrt{3}$
(C) $10\sqrt{2}$ (D) $20\sqrt{2}$

31. Which one of the following is correct ?

निम्नलिखित में से कौन-सा एक सही हैं ?

(A) $\sqrt{2} < \sqrt[4]{6} < \sqrt[3]{4}$ (B) $\sqrt{2} > \sqrt[4]{6} > \sqrt[3]{4}$
(C) $\sqrt[4]{6} < \sqrt{2} < \sqrt[3]{4}$ (D) $\sqrt[4]{6} > \sqrt{2} > \sqrt[3]{4}$

32. If $x = \frac{91}{216}$ then the value of $3 - \frac{1}{(1-x)^{1/3}}$ is.

यदि $x = \frac{91}{216}$ है, तो $3 - \frac{1}{(1-x)^{1/3}}$ का मान क्या हैं ?

(A) $\frac{9}{5}$ (B) $\frac{5}{9}$ (C) $\frac{4}{9}$ (D) $\frac{4}{5}$

33. $\sqrt{4+\sqrt{4-\sqrt{4+\sqrt{4-.....}}}}$ किसके बराबर हैं ?

(A) 3 (B) $\frac{\sqrt{13}-1}{2}$
(C) $\frac{\sqrt{13}+1}{2}$ (D) 0

34. What is $\frac{5+\sqrt{10}}{5\sqrt{5}-2\sqrt{20}-\sqrt{32}+\sqrt{50}}$ equal to ?

यदि $\frac{5+\sqrt{10}}{5\sqrt{5}-2\sqrt{20}-\sqrt{32}+\sqrt{50}}$ किसके बराबर हैं ?

(A) 5 (B) $5\sqrt{2}$
(C) $5\sqrt{5}$ (D) $\sqrt{5}$

CDS 2015_I

35. The square root of $\frac{(0.75)^3}{1-0.75} + [0.75 + (0.75)^2 + 1]$ is.

$\frac{(0.75)^3}{1-0.75} + [0.75 + (0.75)^2 + 1]$ का वर्गमूल क्या हैं ?

(A) 1 (B) 2
(C) 3 (D) 4

36. If $a - b = 4$ and $a^2 + b^2 = 40$ where a and b are positive integers then $a^3 + b^6$ is equal to.

यदि $a - b = 4$ और $a^2 + b^2 = 40$ हैं, जहाँ a और b धनात्मक पूर्णांक हैं, तो $a^3 + b^6$ किसके बराबर हैं ?

(A) 264 (B) 280
(C) 300 (D) 324

37. When a ball bounces it rises to $\frac{2}{3}$ of the height from which it fell. If the ball is dropped from a height of 36m then how high will it rise at the third bounce ?

कोई गेंद अपनी उछाल में, जितनी ऊँचाई से गिरती हैं, उसकी $\frac{2}{3}$ ऊँचाई तक ऊपर उठती हैं। यदि इस गेंद को 36 मी की ऊँचाई से गिराया जाए, तो अपनी तीसरी उछाल में यह कितनी ऊपर उठेगी ?

(A) $10\frac{1}{3}$ मी. (B) $10\frac{2}{3}$ मी.
(C) $12\frac{1}{3}$ मी. (D) $12\frac{2}{3}$ मी.

38. What are the possible solutions for x of the equation $x^{\sqrt{x}} = \sqrt[n]{x^x}$ where x and n are positive integers ?

समीकरण $x^{\sqrt{x}} = \sqrt[n]{x^x}$ के जहाँ x और n धनात्मक पूर्णांक हैं x के लिए सम्भव हल कौन-से हैं ?

(A) 0, n^2 (B) 1, n
(C) n, n^2 (D) 1,n^2

39. Let A and B be finite non-empty sets with the number of elements in A = m and number of elements in B = n. Let m > n. If for some integer $k \geq 1$, the number of non-empty subsets of A = 2^k + the number of non-empty subsets of B then which one of the following is correct ?

मान लीजिए कि A और B परिमित, अतिरिक्त समुच्चय हैं तथा A में तत्वों की संख्या = m और B में तत्वों की संख्या = n हैं। मान लीजिए m > n हैं। यदि किसी पूर्णांक $k \geq 1$ के लिए, A के अतिरिक्त उपसमुच्चयों की संख्या तो निम्नलिखित में से कौन-सा सही हैं ?

(A) m = n + 2
(B) m = n + 1
(C) m = n + t किसी विषम अभाज्य संख्या p के लिए
(D) m = n + t किसी भाज्य संख्या t के लिए

40. If n is a natural number and $n = p_1^{x_1}p_2^{x_2}p_3^{x_3}$ where p_1, p_2, p_3 are distinct prime factors, then the number of prime factors for n is.

यदि n एक धन पूर्णांक हैं और $n = p_1^{x_1}p_2^{x_2}p_3^{x_3}$ जहाँ p_1, p_2, p_3 भिन्न अभाज्य गुणनखण्ड हैं,तो n के अभाज्य गुणनखण्डों की संख्या क्या हैं ?

(A) $x_1 + x_2 + x_3$
(B) $x_1x_2x_3$
(C) $(x_1 + 1)(x_2 + 1)(x_3 + 1)$
(D) इनमें से कोई नहीं

CDS 2014_II

41. What is the remainder when is $(17^{23} + 23^{23} + 29^{23})$ is divided by 23 ?

$(17^{23} + 23^{23} + 29^{23})$ को 23 से भाग देने पर शेषफल क्या हैं ?

(A) 0 (B) 1
(C) 2 (D) 3

CDS 2014_I

42. The difference of two consecutive cube.

दो क्रमागत घनों का अन्तर कैसा हैं ?

(A) is odd or even/ विषम या सम
(B) is never divisible by 2 /2 से विभाज्य कभी नहीं
(C) is always even/ सदैव सम
(D) None of these / उपरोक्त में से कोई नहीं

43. The product of for consecutive natural number plus one is.

चार क्रमागत धन पूर्णांकों का गुणनफल और एक का योगफल क्या हैं ?

(A) a non-square / वर्ग नहीं
(B) always sum of two square number
सदैव दो वर्ग संख्याओं का योगफल
(C) a square/ वर्ग
(D) None of the above / उपरोक्त में से कोई नहीं

44. Consider the following in respect of the number $\sqrt{2}, \sqrt[3]{3}$ and $\sqrt[6]{6}$

संख्याओं $\sqrt{2}, \sqrt[3]{3}, \sqrt[6]{6}$ के बारे में निम्नलिखित पर विचार कीजिए।

i. $\sqrt[6]{6}$ is the greatest number / $\sqrt[6]{6}$ महत्तम संख्या हैं।

ii. $\sqrt{2}$ is the smallest number

$\sqrt{2}$ लघुत्तम संख्या हैं।

Which of the above statement (s) is/ are correct ?

उपरोक्त कथनों में से कौन-सा/से कथन सही हैं ?

(A) Only i/ केवल i
(B) Only ii/केवल ii
(C) Both i and ii/i और ii दोनों
(D) Neither i nor ii /न तो i और न ही ii

45. What is the remainder when 4^{1000} is divided by 7 ?

जब 4^{1000} को 7 से विभाजित किया जाता हैं तो शेषफल क्या हैं ?

(A) 1 (B) 2
(C) 4
(D) इनमें से कोई नहीं

CDS 2013_II

46. Which is the smallest number among the following ?

निम्नलिखित में सबसे छोटी संख्या कौन-सी हैं ?

(A) $[(5^{-2})^{-2}]^{-2}$ (B) $[(5^{-2})^{2}]^{-2}$
(C) $[(2^{-5})^{-2}]^{-2}$ (D) $[(2^{-5})^{2}]^{-2}$

47. यदि $x^2 = 6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + ...\infty}}}$ है तो x का मान किसके तुल्य होगा ?

(A) 6
(B) 5
(C) 4
(D) 3

CDS 2013_I

48. What is the value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + ...}}}}$

$\sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + ...}}}}$ का मान क्या हैं ?

(A) 2
(B) 3
(C) 3.5
(D) 4

49. The expression $\left[\left(\sqrt{2}\right)^{\sqrt{2}}\right]^{\sqrt{2}}$ gives.

व्यंजक $\left[\left(\sqrt{2}\right)^{\sqrt{2}}\right]^{\sqrt{2}}$ क्या हैं ?

(A) a natural number/ धन पूर्णांक हैं
(B) an integer and not a natural number
पूर्णांक है और धन पूर्णांक नहीं हैं
(C) a rational number but not an integer
परिमेय संख्या हैं, किन्तु पूर्णांक नहीं हैं
(D) a real number but not a rational number
वास्तविक संख्या हैं, किन्तु परिमेय संख्या नहीं हैं

50. If $16 \times 8^{n+2} = 2^m$ then m is equal to.
यदि $16 \times 8^{n+2} = 2^m$ है तो m किसके तुल्य हैं ?
(A) n + 8 (B) 2n + 10
(C) 3n + 2 (D) 3n + 10

CDS 2012_II

51. The least number of four digits which is a perfect square is.
वह चार अंकों की न्यूनतम संख्या कौन-सी है जो पूर्ण वर्ग हैं ?
(A) 1204 (B) 1024
(C) 1402 (D) 1420

52. If $\sqrt{10+\sqrt[3]{x}} = 4$ then what is the value of x ?

यदि $\sqrt{10+\sqrt[3]{x}} = 4$ है तब x किसके बराबर हैं ?
(A) 150 (B) 216
(C) 316 (D) 450

53. If $a = 2+\sqrt{3}$ then what is the value of $(a^2 + a^{-2})$.
यदि $a = 2+\sqrt{3}$ हो, तो $(a^2 + a^{-2})$ का मान क्या हैं ?
(A) 12 (B) 14
(C) 16 (D) 18

54. If $196x^4 = x^6$ then x^3 is equal to which one of the following ?
यदि $196x^4 = x^6$ हो, तब x^3 निम्नलिखित में से किसी एक के बराबर हैं ?

(A) $\frac{x^6}{14}$ (B) $14x^4$ (C) $\frac{x^2}{14}$ (D) $14x^2$

55. $\left(15+\sqrt{200}\right)$ और $\left(27-\sqrt{648}\right)$ का मध्यानुपाती क्या हैं ?

(A) 4 (B) $14\sqrt{7}$
(C) $3\sqrt{5}$ (D) $5\sqrt{3}$

CDS 2012_I

56. What is one of the square roots of $16x^6 - 24x^5 + 25x^4 + 20x^3 + 10x^2 - 4x + 1$
$16x^6 - 24x^5 + 25x^4 + 20x^3 + 10x^2 - 4x + 1$ के वर्गमूलों में एक कौन हैं ?
(A) $4x^3 - 3x^2 + 2x + 1$ (B) $4x^3 - 3x^2 - 2x - 1$
(C) $4x^3 - 3x^2 + 2x - 1$ (D) $4x^3 - 3x^2 - 2x + 1$

57. What is $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} + \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$ equal to?

$\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} + \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$ किसके बराबर हैं ?
(A) 16 (B) 8
(C) 4 (D) $\sqrt{15}$

58. What is the value of $\frac{\sqrt{0.0032}}{0.32}$?

$\frac{\sqrt{0.0032}}{0.32}$ का मान क्या हैं ?
(A) 0.0001 (B) 0.001
(C) 0.01 (D) 0.1

59. If $2^m + 2^{1+m} = 24$, then what is the value of m?
यदि $2^m + 2^{1+m} = 24$ हो, तो m का मान क्या हैं ?

(A) 0 (B) $\frac{1}{3}$ (C) 3 (D) 6

60. What is the smallest number that must be added to 1780 to make it a perfect square ?
1780 में न्यूनतम कौन-सी संख्या जोड़कर उसे पूर्ण वर्ग बनाया जा सकता हैं ?
(A) 39
(B) 49
(C) 59
(D) 69

CDS 2011

61. What is the square root of $\frac{0.324 \times 0.64 \times 129.6}{0.729 \times 1.024 \times 36}$?

$\frac{0.324 \times 0.64 \times 129.6}{0.729 \times 1.024 \times 36}$ का वर्गमूल क्या हैं ?
(A) 4
(B) 3
(C) 2
(D) 1

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62. What is one of the square roots of $9-2\sqrt{14}$?
$9-2\sqrt{14}$ का एक वर्गमूल क्या हैं ?
(A) $\sqrt{7}-\sqrt{3}$
(B) $\sqrt{6}-\sqrt{3}$
(C) $\sqrt{7}-\sqrt{5}$
(D) $\sqrt{7}-\sqrt{2}$

63. If $3^x \times 27^x = 9^{x+4}$ then what is x equal to ?
यदि $3^x \times 27^x = 9^{x+4}$ हो तो x किसके बराबर हैं ?
(A) 4 (B) 5
(C) 6 (D) 7

64. What $\frac{1}{\sqrt{9}-\sqrt{8}}-\frac{1}{\sqrt{8}-\sqrt{7}}+\frac{1}{\sqrt{7}-\sqrt{6}}$
$-\frac{1}{\sqrt{6}-\sqrt{5}}+\frac{1}{\sqrt{5}-\sqrt{4}}$ is equal to ?
किसके बराबर हैं ?
(A) 0 (B) 1 (C) 5 (D) $\frac{1}{3}$

65. If $p^x = r^y = m$ and $r^w = p^z = n$ then which one of the following is correct ?
यदि $p^x = r^y = m$ और $r^w = p^z = n$ हैं, तो निम्नलिखित में से कौन-सा एक सही हैं ?
(A) xw = yz
(B) xz = yw
(C) x + y = w + z
(D) x – y = w – z

CDS 2010

66. What is the value of/का मान क्या हैं ?
$\sqrt{29.16}+\sqrt{0.2916}+\sqrt{0.002916}+\sqrt{0.00002916}$
(A) 5.9949 (B) 5.9894
(C) 5.9984 (D) 5.9994

Solution

1. (C) $\dfrac{b+\sqrt{b^2-2bx}}{b-\sqrt{b^2-2bx}} = a$

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

$\dfrac{b(a-1)}{(a+1)} = \sqrt{b^2-2bx}$

square both side

$\dfrac{b^2(a-1)^2}{(a+1)^2} = b^2-2bx$

$2bx = b^2 - \dfrac{b^2a^2+b^2-2b^2a}{a^2+1+2a}$

$\Rightarrow \dfrac{a^2b^2+b^2+2ab^2-b^2a^2-b^2+2b^2a}{(a+1)^2}$

$\Rightarrow \quad 2bx = \dfrac{4ab^2}{(a+1)^2} \quad \Rightarrow \quad x = \dfrac{2ab}{(a+1)^2}$

2. (B) $\dfrac{(x-1)(x^2+x+1)(x^2-9x+14)}{(x^2+x+1)(x^2-8x+7)}$

$= \dfrac{(x-1)(x-7)(x-2)}{(x-7)(x-1)} = (x-2)$

3. (A) $\dfrac{1}{(x-2)(x-4)} + A = \dfrac{2x-5}{(x^2-5x+6)(x-4)}$

$\Rightarrow \quad A = \dfrac{2x-5}{(x^2-5x+6)} - \dfrac{1}{(x-2)(x-4)}$

$\Rightarrow \dfrac{2x-5-x+3}{(x-2)(x-3)(x-4)} = \dfrac{(x-2)}{(x-2)(x-3)(x-4)}$

$\Rightarrow \quad \dfrac{1}{(x-3)(x-4)} = \dfrac{1}{x^2-7x+12}$

4. (A) $x^m = \sqrt[14]{x \times \sqrt{x^{3/2}}}$

$x^m = \sqrt[14]{x \times x^{3/4}}$

$x^m = \sqrt[14]{x^{7/4}}$

$x^m = x^{\frac{7}{4}\times\frac{1}{14}} = \quad \Rightarrow \quad x^m = x^{\frac{1}{8}}$

$\therefore \quad m = \dfrac{1}{8}$

5. (C) $\sqrt{2} - 1 + \sqrt{3} - \sqrt{2} + \sqrt{4} - \sqrt{3} + \sqrt{5} - \sqrt{4} +$ ..... $\sqrt{100} - \sqrt{99}$

$= - + 10 = 9$

6. (D) $2^{\frac{1}{2}}, 3^{\frac{3}{2}}, 6^{\frac{3}{2}}$

$\Rightarrow \quad (2^{1/2})^6, (3^{3/2})^6, (6^{3/2})^6$

$\Rightarrow \quad 2^3, 3^9, 6^9$

$\therefore \quad z > y > x$

7. (A) $x^{\sqrt{x}} = \sqrt[x]{x^x}$

$x^{\sqrt{x}} = x^{\frac{x}{n}}$

$\therefore \quad \sqrt{x} = \dfrac{x}{n}$

$\Rightarrow \quad x = \dfrac{x^2}{n^2}$

$x = n^2$

Both option (A) and (B) are right. So we put x = 1 which satisfy the equation when x = n does not satisfy the equation.

8. (C) $a = \sqrt{7+2\sqrt{12}}$

$a = 2 + \sqrt{3}$

$\dfrac{1}{a} = 2 - \sqrt{3}$

$\therefore \quad a + \dfrac{1}{a} = 4$

9. (C) $\sqrt{16+6\sqrt{7}} = \sqrt{16+2\sqrt{63}} = \sqrt{\left(\sqrt{9}+\sqrt{7}\right)^2}$

$= 3 + \sqrt{7}$

10.(B) $\dfrac{1}{a+\dfrac{1}{b+\dfrac{1}{c+\dfrac{1}{2}}}} = \dfrac{1}{\dfrac{23}{16}} = \dfrac{1}{1+\dfrac{7}{16}}$

$\therefore \quad a = 1$

$\Rightarrow \quad \dfrac{1}{a+\dfrac{1}{b+\dfrac{1}{c+\dfrac{1}{2}}}} = \dfrac{1}{1+\dfrac{1}{2+\dfrac{2}{7}}}$

$\therefore \quad b = 2$

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$$\Rightarrow \quad \frac{1}{a+\dfrac{1}{b+\dfrac{1}{c+\dfrac{1}{2}}}} = \frac{1}{1+\dfrac{1}{2+\dfrac{1}{3+\dfrac{1}{2}}}}$$

$\therefore$ c = 3

Required answer = $\dfrac{3+2+1}{3} = 2$

11.(D) $x = \dfrac{4\sqrt{6}}{\sqrt{2}+\sqrt{3}}$

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

by C/D

$$\frac{x+2\sqrt{2}}{x-2\sqrt{2}} = \frac{2\sqrt{3}+\sqrt{2}+\sqrt{3}}{2\sqrt{3}-\sqrt{2}-\sqrt{3}} = \frac{3\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} \quad ...(1)$$

$$x = \frac{4\sqrt{6}}{\sqrt{2}+\sqrt{3}}$$

$$\Rightarrow \quad \frac{x}{2\sqrt{3}} = \frac{2\sqrt{2}}{\sqrt{2}+\sqrt{3}}$$

by componendo and dividendo

$$\frac{x+2\sqrt{3}}{x-2\sqrt{3}} = \frac{2\sqrt{2}+\sqrt{2}+\sqrt{3}}{2\sqrt{2}-\sqrt{2}-\sqrt{3}}$$

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

by adding (1) and (2)

$$\frac{x+2\sqrt{2}}{x-2\sqrt{2}} + \frac{x+2\sqrt{3}}{x-2\sqrt{3}}$$

$$\Rightarrow \frac{3\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} + \frac{3\sqrt{2}+\sqrt{3}}{\sqrt{2}-\sqrt{3}} = 2$$

12.(*) $3 + \dfrac{1}{x+\dfrac{1}{y+\dfrac{1}{z}}} = 3 + \dfrac{3}{11}$

13.(A) $\dfrac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}} - \dfrac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$

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

$[\because (a+b)(a-b) = a^2 - b^2]$

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

$[\because (a+b)^2 = a^2 + 2ab + b^2$ and $(a-b)^2 = a^2 - 2ab + b^2]$

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

14.(C) Let $y = \sqrt{1+\sqrt{1+\sqrt{1+...}}}$

Then, $y = \sqrt{1+y}$ Also, $y > 0$

On squaring both sides, we get

$y^2 = 1 + y$

$\Rightarrow \quad y^2 - y - 1 = 0$

$$\Rightarrow \quad y = \frac{1 \pm \sqrt{1+4}}{2}$$

$\because$ y can't be negative

$$\therefore y = \frac{1+\sqrt{5}}{2} \in (1, 2)$$

15.(C) Let $y = \dfrac{(0.35)^2 + 0.70 + 1}{2.25} + 0.19$

$$= \frac{(0.35)^2 + 2 \times 0.35 \times 1 + (1)^2}{(1.5)^2} + 0.19$$

$$= \frac{(0.35+1)^2}{(1.5)^2} + 0.19 = \left(\frac{1.35}{1.5}\right)^2 + 0.19$$

$= (0.19)^2 + 0.19 = 0.81 + 0.19 = 1$

$\therefore \quad \sqrt{y} = \sqrt{1} = 1$

16.(A) We have $x = \dfrac{\sqrt{a+b} - \sqrt{a-b}}{\sqrt{a+b} + \sqrt{a-b}}$

$$\Rightarrow x = \frac{\sqrt{a+b} - \sqrt{a-b}}{\sqrt{a+b} + \sqrt{a-b}} \times \frac{\sqrt{a+b} - \sqrt{a-b}}{\sqrt{a+b} - \sqrt{a-b}}$$

$$\Rightarrow x = \frac{\left(\sqrt{a+b} - \sqrt{a-b}\right)^2}{(a+b)-(a-b)}$$

$$\Rightarrow x = \frac{a+b+a-b-2\sqrt{a^2-b^2}}{2b}$$

$$\Rightarrow \frac{2a-2\sqrt{a^2-b^2}}{2b}$$

$$\Rightarrow x = \frac{a-\sqrt{a^2-b^2}}{b}$$

$\Rightarrow bx = a - \sqrt{a^2 - b^2}$

$\Rightarrow a - bx = \sqrt{a^2 - b^2}$

On squaring, both the sides, we get

$\Rightarrow (a - bx)^2 = a^2 - b^2$

$\Rightarrow a^2 + b^2x^2 - 2abx = a^2 - b^2$

$\Rightarrow b^2x^2 - 2abx + b^2 = 0$

$\Rightarrow bx^2 - 2ax + b = 0$

17.(C) $\dfrac{(443+547)^2+(443-547)^2}{443\times443+547\times547}$

$$=\frac{(443)^2+(547)^2+2\times443\times547+(443)^2+(547)^2-+2\times443\times547}{(443)^2+(547)^2}$$

$$=\frac{2\left[(443)^2+(547)^2\right]}{\left[(443)^2+(547)^2\right]}=2$$

18.(A) We have $5^{1+x} + 5^{1-x} = 26$

$\Rightarrow 5.5^x + 5.5^{-x} = 26$

$\Rightarrow 5.5^x + \dfrac{5}{5^x} = 26$

Let, $5^x = y$

$\therefore 5y + \dfrac{5}{y} = 26 \Rightarrow 5y^2 - 26y + 5 = 0$

$\Rightarrow 5y^2 - 25y - y + 5 = 0$

$\Rightarrow 5y(y - 5y) - 1(y - 5) = 0$

$\Rightarrow (y - 5y)(5y - 1) = 0 \Rightarrow y = 5, \dfrac{1}{5}$

$\Rightarrow 5^x = 5 \text{ or } 5^{-1} \Rightarrow x = 1 \text{ or } -1$

19.(A) $\sqrt[3]{4\dfrac{12}{125}}=\sqrt[3]{\dfrac{4\times125+12}{125}}$

$$=\sqrt[3]{\frac{500+12}{125}}=\sqrt[3]{\frac{512}{125}}=\sqrt[3]{\left(\frac{8}{5}\right)^3}$$

$$=\left[\left(\frac{8}{5}\right)^3\right]^{\frac{1}{3}}=\left(\frac{8}{5}\right)^{3\times\frac{1}{3}}=\frac{8}{5}=1\frac{3}{5}$$

20. (C) $\dfrac{(243+647)^2+(243-647)^2}{243\times243+647\times647}$

$$=\frac{2\left[(243)^2+(647)^2\right]+2\times243\times647-2\times243\times647}{(243)^2+(647)^2}$$

$$=\frac{2(243)^2+(647)^2}{(243)^2+(647)^2}=2$$

21. (D) दिया हैं, $x - y = 8$

तथा $\sqrt{\dfrac{x}{y}}=\dfrac{10}{3}-\sqrt{\dfrac{y}{x}}$

अब, $\sqrt{\dfrac{x}{y}}+\sqrt{\dfrac{y}{x}}=\dfrac{10}{3}\Rightarrow\dfrac{\left(\sqrt{x}\right)^2+\left(\sqrt{y}\right)^2}{\sqrt{xy}}=\dfrac{10}{3}$

$\Rightarrow x + y = \dfrac{10}{3}\sqrt{xy}$

सभी (ii) के दोनों पक्षों का वर्ग करने पर

$(x+y)^2=\dfrac{100}{9}(xy)$

$\Rightarrow (x - y)^2 + 4xy = \dfrac{100}{4}$

(xy) [$\because (x + y)^2 = (x - y)^2 + 4xy$]

$\Rightarrow (8)^2 = \left(\dfrac{100}{4} - 4\right)(xy)$ [सभी (i) से]

$\Rightarrow 64 = \dfrac{64}{9}(xy) \Rightarrow xy = 9$

22. (B) यदि m तथा n भिन्न-भिन्न प्राकृतिक संख्याएँ हैं, तब

i. $\left(\dfrac{m}{n}+\dfrac{n}{m}\right)$ एक पूर्णांक होगा यदि और केवल यदि $m = n$ अत: कथन i असत्य हैं।

ii. $mn\left(\dfrac{m}{n}+\dfrac{n}{m}\right)(m^2 + n^2)^{-1}$

$$= mn\left(\frac{m^2+n^2}{n}\right)\frac{1}{m^2+n^2}=1$$

अत: कथन ii, m तथा n के सभी मानों के लिए सत्य हैं।

iii. अब $\dfrac{mn}{m^2+n^2}$ एक भिन्न हैं, यदि $m = n$

$$= mn\left(\frac{m^2+n^2}{n}\right)\frac{1}{m^2+n^2}=1$$

अत: कथन iii असत्य हैं।

23. (A) दिया हैं $\dfrac{a}{b}=\dfrac{b}{c}=\dfrac{c}{d}=k$ [माना]

तब, $a = bk, b = ck, c = dk$

$\therefore a = dk^3, b = dk^2, c = dk$

i. $\dfrac{b^3+c^3+d^3}{a^3+b^3+c^3}=\dfrac{(dk)^3+(dk)^3+d^3}{\left(dk^3\right)^3+\left(dk^2\right)^3+(dk)^3}$

$$= \frac{d^3\left(k^6+k^3+1\right)}{d^3\left(k^9+k^6+k^3\right)} = \frac{d^3\left(k^6+k^3+1\right)}{k^3\left(k^6+k^3+1\right)} = \frac{1}{3} = \frac{d}{a}$$

अत: कथन i सही हैं।

ii. $\frac{a^2+b^2+c^2}{b^2+c^2+d^2} = \frac{\left(dk^3\right)^2+\left(dk^2\right)^2+(dk)^2}{\left(dk^2\right)^2+(dk)^2+d^2}$

$$= \frac{d^2\left(k^6+k^4+k^2\right)}{d^2\left(k^4+k^2+1\right)} = \frac{k^2\left(k^4+k^2+1\right)}{k^4+k^2+1}$$

$$= k^2 = \frac{b}{d}$$

अत: कथन ii असत्य हैं।

24. (D) $7^{10} - 5^{10} = (7^5)^2 - (5^5)^2 = (7^5+5^5)(7^5-5^5)$
$= (1680 + 3125)(7^5-5^5) = 19932 \times (7^5-5^5)$
अत: 19932, 11 से विभाज्य हैं।

25. (A) दिया हैं $x = 2^{1/3} + 2^{-1/3}$
$\therefore 2x^3 - 6x - 5 = 2(2^{1/3} + 2^{-1/3})^3 - 6(2^{1/3} + 2^{-1/3}) - 5$
$= 2[2+2^{-1} + 3(2^{1/3} + 2^{-1/3})] - 6(2^{1/3} + 2^{-1/3}) - 5$
$= 4 + 2\frac{1}{2} \times 6(2^{1/3} + 2^{-1/3})] - 6(2^{1/3} + 2^{-1/3}) - 5$
$= 4 + 1 - 5 = 5 - 5 = 0$

26. (A) यदि बहुपद $(x^n + m^n)$ को $(x - m)$ से विभाजित करने पर शेषफल R प्राप्त होता हैं, तब $(x^n + m^n - R)$, $(x - m)$ द्वारा विभाज्य हैं।
माना $f(x) = x^n + m^n - R$
$\because f(x)$, $(x - m)$ द्वारा विभाज्य हैं।
$\therefore f(m) = 0 \Rightarrow m^n + m^n - R = 0 \Rightarrow R = 2m^n$
$\because$ m एक अशून्य पूर्णांक हैं तथा n एक धनात्मक पूर्णांक हैं।
अत: R एक शून्येत्तर सम पूर्णांक हैं।

27. (B) दिया हैं, $4^x2^y = 128 \Rightarrow 2^{2x+y} = 2^7$
$\Rightarrow 2x + y = 7$ [$\because a^n = a^m \Rightarrow n = m$]...(i)
तथा $3^{3x}2^{2y} - 9^{xy} = 0 \Rightarrow 3^{3x+2y} = 3^{2xy}$
$\Rightarrow 3x + 2y = 2xy$ [$\because a^n = a^m \Rightarrow n = m$]...(ii)
सभी (i) से y का मान सभी (ii) में रखने पर,
$3x + 2 \times (7 - 2x) = 2x \times (7 - 2x)$
$\Rightarrow 3x + 14 - 4x = 14x - 4x^2$
$\Rightarrow 4x^2 + 15x + 14 = 0$
$\Rightarrow 4x^2 + 8x - 7x + 14 = 0$
$\Rightarrow 4x(x - 2) - 7(x - 2) = 0$
$\Rightarrow (4x - 7)(x - 2) = 0$

$$x = 2 \text{ या } \frac{7}{4}$$

$\therefore x = 2$ [चूँकि x का मान भिन्नात्मक नहीं हो सकता]

x का मान सभी (i) में रखने पर
$2 \times 2 + y = 7 \Rightarrow y = 7 - 4$
$\Rightarrow y = 3$
$\therefore x + y = 2 + 3 = 5$

28. (A) दिया हैं, $x = \frac{\sqrt{a+2b} + \sqrt{a-2b}}{\sqrt{a+2b} - \sqrt{a-2b}}$

अब, इसका परिमेयीकरण करने पर,

$$x = \frac{\left(\sqrt{a+2b}\right)^2 + \left(\sqrt{a-2b}\right)^2 + \sqrt{(2a+2b)} + 2\sqrt{(a+2b)(a-2b)}}{\left(\sqrt{a+2b}\right)^2 - \left(\sqrt{a-2b}\right)^2}$$

$$\Rightarrow x = \frac{a+2b+a-2b+2\sqrt{a^2-4b^2}}{a+2b-a+2b}$$

$$\Rightarrow x = \frac{2a+2\sqrt{a^2-4b^2}}{4b}$$

$$\Rightarrow x = \frac{a+\sqrt{a^2-4b^2}}{2b}$$

$\Rightarrow bx^2 - ax + b = 0$

29. (A) दिया हैं $a^3 - b^3 = 117$ .....(i)
तथा $a - b = 3$ ..... (ii)
सभी (ii) के दोनों पक्षों का घन करने पर
$(a - b)^3 = (3)^3$
$\Rightarrow a^3 - b^3 - 3ab(a - b) = 27$
$\Rightarrow 117 - 3ab(3) = 27$ [सभी (ii) से]
$\Rightarrow 117 - 9ab = 27 \Rightarrow 9ab = 90$
$\Rightarrow ab = 10$
अब $(a + b)^2 = (a - b)^2 + 4ab$
$\Rightarrow (a + b)^2 = (3)^2 + 4 \times 10$
$\Rightarrow (a + b)^2 = 9 + 40 = 49$
$\therefore (a + b) = 7$ [$\because a > 0$ तथा $b > 0$]

30. (B) दिया हैं, $x = \sqrt{3} + \sqrt{2}$

$$\because \frac{1}{x} = \frac{1}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$$

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

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

दोनों पक्षों का घन करने पर,

$$x^3 + \frac{1}{x^3} + 3\left(x + \frac{1}{x}\right) = 24\sqrt{3}$$

$\because x^3+\frac{1}{x^3}+x+\frac{1}{x}=24\sqrt{3}-2\left(x+\frac{1}{x}\right)$

$=24\sqrt{3}-2\times 2\sqrt{3}$

$=24\sqrt{3}-4\sqrt{3}=20\sqrt{3}$

31. (A) दिया हैं $\sqrt{2},\sqrt[4]{6},\sqrt[3]{4}$ या $2^{\frac{1}{2}},6^{\frac{1}{6}},4^{\frac{1}{4}}$

2, 4, 3 ल.स. 12 हैं।

$\left(2^6\right)^{\frac{1}{12}};\left(6^3\right)^{\frac{1}{12}};\left(4^4\right)^{\frac{1}{12}}$

$(64)^{\frac{1}{12}};(216)^{\frac{1}{12}};(256)^{\frac{1}{12}}$

$\sqrt{2}<\sqrt[4]{6}<\sqrt[3]{4}$

32. (A) दिया हैं $x=\frac{91}{216}\Rightarrow 1-\frac{91}{216}=\frac{125}{216}=\left(\frac{5}{6}\right)^3$

$\Rightarrow (1-x)^{1/3}=\frac{5}{6}\Rightarrow\frac{1}{(1-x)^{1/3}}=\frac{6}{5}$

$\Rightarrow 3-\frac{1}{(1-x)^{1/3}}=3-\frac{6}{5}=\frac{9}{5}$

33. (C) माना

$\sqrt{4+\sqrt{4-\sqrt{4+\sqrt{4-....}}}}\Rightarrow x=\sqrt{4+\sqrt{4-x}}$

दोनों पक्षों का वर्ग करने पर

$x^2=4+\sqrt{4-x}$

$\Rightarrow \quad x^2-4=\sqrt{4-x}$

$\Rightarrow \quad \left(x^2-4\right)^2=\sqrt{4-x}$

$\Rightarrow x^4-8x^2+16=4-x$

$\Rightarrow x^4-8x^2+x+12=0$

$\Rightarrow (x^2-x-3)(x^2+x-4)=0$

$\Rightarrow x^2-x-3=0$

या $x^2+x-4=0$

$x^2-x-3=0$

$\therefore \quad x=\frac{1\pm\sqrt{1+12}}{2}$

$=\frac{1\pm\sqrt{13}}{2}=\frac{1+\sqrt{13}}{2}$

[$\because$ ऋणात्मक चिन्ह छोड़ने पर]

34. (D) $\frac{5+\sqrt{10}}{5\sqrt{5}-2\sqrt{20}-\sqrt{32}+\sqrt{50}}$

$=\frac{5+\sqrt{10}}{5\sqrt{5}-4\sqrt{5}-4\sqrt{2}+5\sqrt{2}}=\frac{5+\sqrt{10}}{\sqrt{5}+\sqrt{2}}$

$=\frac{5+\sqrt{10}}{\left(\sqrt{5}+\sqrt{2}\right)}\times\frac{\left(\sqrt{5}-\sqrt{2}\right)}{\left(\sqrt{5}-\sqrt{2}\right)}$ [परिमेयीकरण करने पर]

$=\frac{5\sqrt{5}-5\sqrt{2}+\sqrt{50}-\sqrt{20}}{\sqrt{5^2}-\sqrt{2^2}}$

[$\because (a-b)(a+b)=a^2-b^2$]

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

35. (B) $\sqrt{\frac{(0.75)^3}{1-0.75}+[0.75+(0.75)^2+1]}$

$=\sqrt{\frac{(0.75)^3}{0.25}+[1.75+(0.75)^2]}$

$=\sqrt{1.6875+2.3125}=\sqrt{4}=2$

अत: अभीष्ट वर्गमूल 2 हैं।

36. (B) दिया हैं, $a-b=4$ ..... (i)

दोनों पक्षों का वर्ग करने पर,

$(a-b)^2=(4)^2$

$\Rightarrow a^2+b^2-2ab=16$

$\Rightarrow 40-2ab=16$ [$\because a^2+b^2=40$]

$\Rightarrow 2ab=40-16$

$\Rightarrow 2ab=24\Rightarrow ab=12$

$a+b=\sqrt{a^2+b^2+2ab}$

$=\sqrt{40+24}=\sqrt{64}=8$

$a+b=8$ ..... (ii)

सभी (i) तथा (ii) को जोड़ने पर

$2a=12\Rightarrow a=6$

सभी (i) में a का मान रखने पर $6-b=4\Rightarrow b=2$

अब $a^3+b^3=6^3+2^6=2^3\times 3^3+2^6=2^3(3^3+2^3)$

$=8(27+8)=8\times 35=280$

37. (B) पहली उछाल के बाद, गेंद की ऊँचाई $=\left(\frac{2}{3}\right)^1\times 36$

तथा तीसरी उछाल के बाद, गेंद की ऊँचाई $=\left(\frac{2}{3}\right)^3\times 36$

$=\frac{8}{27}\times 36=\frac{8\times 4}{3}=\frac{32}{3}=10\frac{2}{3}$ मी.

अत: तीसरी उछाल के बाद गेंद की ऊँचाई $10\frac{2}{3}$ मी हैं।

38. (A) दिया हैं $x^{\sqrt{x}} = \sqrt[n]{x^x}$ जहाँ x तथा n धनात्मक पूर्णांक हैं
दोनों तरफ log लेने पर

$$\log x^{\sqrt{x}} = \log\left[\sqrt[n]{x^x}\right]$$

$$\Rightarrow \quad \sqrt{x}\log x = \log\left(x^x\right)^{1/n} = \log x^{x/n}$$

$$\Rightarrow \quad \sqrt{x}\log x = \frac{x}{n}\log x$$

$$\Rightarrow \quad \sqrt{x}\log x - \frac{x}{n}\log x = 0$$

$$\Rightarrow \quad \log x\left[\sqrt{x} - \frac{x}{n}\right] = 0$$

$\because \log x \neq 0$

$$\therefore \sqrt{x} - \frac{x}{n} = 0 \Rightarrow \sqrt{x} = \frac{x}{n} \Rightarrow \frac{x}{\sqrt{x}} = n$$

दोनों तरफ का वर्ग करने पर, $\frac{x^2}{x} = n^2$

$\Rightarrow x^2 - n^2 = 0 \Rightarrow x(x - n^2) = 0$
$\therefore x = 0$ या $x = n^2$
अत: x के सम्भव हल 0, n^2 हैं।

39. (B) प्रश्नानुसार $2^m - 1 = 2^k + 2^n - 1$
$\Rightarrow 2^m = 2^k + 2^n$
विकल्प (B) से $m = n + 1$
$\therefore 2^{n+1} = 2^k + 2^n \Rightarrow 2.2^n = 2^k + 2^n$
$\Rightarrow 2^n(2 - 1) = 2^k \Rightarrow 2^n = 2^k$
$\therefore n = k$ जोकि सम्भव हैं।

40. (C) यदि दी गई संख्याओं के गुणनखण्ड $p_1^{\alpha_1}, p_2^{\alpha_2} \ldots\ldots p_n^{\alpha_n}$ रूप में हैं, तब संख्याओं के अभाज्य गुणनखण्ड $(\alpha_1 + 1)(\alpha_2 + 1)\ldots.(\alpha_n + 1)$होगें। अत: n अभाज्य गुणनखण्ड $(x_1 + 1)(x_2 + 1)$ तथा$(x_3 + 1)$ हैं।

41. (A) $\frac{17^{23} + 23^{23} + 29^{23}}{23}$

$$= \frac{(23\times1-6)^{23} + (23\times1+0)^{23} + (23\times1+6)^{23}}{23}$$

$$\therefore \text{अभीष्ट शेषफल} = \frac{(-6)^{23} + (6)^{23}}{23} = 0$$

42. (B) दिए गए विकल्पों में विकल्प (B) संगत हैं, क्योंकि दो क्रमागत घनों का अन्तर सदैव विषम होगा और 2 से अभाज्य छोटा हैं।
जैसे — $(2)^3 = 8, (3)^3 = 27$
$\Rightarrow 27 - 8 = 21$
$\therefore \frac{21}{2} = 10.5$

43. (C) चार क्रमागत धन पूर्णांकों का गुणनफल और एक का योगफल सदैव किसी धन पूर्णांक का वर्ग होता हैं।
जैसे — $(17 \times 18 \times 19 \times 20) + 1 = 116280 + 1$
$= 116281$
$= (341)^2$

44. (D) दिए गए संख्याओं की तुलना करने पर
$2^{1/3}, 3^{1/3}, 6^{1/6}$
2, 3, 6 का ल.स. = 6

$$\therefore (2)^{3\times\frac{1}{6}}, (3)^{2\times\frac{1}{6}}, (6)^{1\times\frac{1}{6}}$$

$$\sqrt[3]{3} > \sqrt{2} > \sqrt[6]{6}$$

45. (C) $\frac{\left(4^4\right)^{250}}{7}$

$\Rightarrow$ शेष = 4

46. (C)

(A) $[(5^{-2})^{-2}]^{-2} = 5^{-8} = \frac{1}{5^8} = \frac{1}{\left(5^2\right)^4}$

(B) $[(5^{-2})^2]^{-2} = 5^8$

(C) $[(2^{-5})^{-2}]^{-2} = 2^{-20}\ \frac{1}{2^{20}} = \frac{1}{\left(2^5\right)^4}$

(D) $[(2^{-5})^2]^{-2} = 2^{-20}$
यहाँ $(5^{-2})^4 < (2^5)^4$

$$\because \quad \frac{1}{\left(2^5\right)^4} < \frac{1}{\left(5^2\right)^4}$$

$\therefore \quad (2^{-5})^4 < (5^{-2})^4$
$\therefore$ सबसे छोटी संख्या = $[(2^{-5})^{-2}]^{-2}$

47. (D) यहाँ $x^2 = 6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \ldots\ldots\infty}}}$

$\therefore x^2 = 6 + \sqrt{x^2} \quad \Rightarrow \quad x^2 = 6 + x$
$\Rightarrow x^2 - x - 6 = 0$
$\Rightarrow x^2 + 2x - 3x - 6 = 0$
$\Rightarrow x(x + 2) - 3(x + 2) = 0 \Rightarrow (x - 3)(x + 2) = 0$
$\therefore x = 3 \qquad [\because x \neq -2]$

48. (B) माना

$$y = \sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \ldots\ldots}}}} \Rightarrow y = \sqrt{6 + y}$$

दोनों पक्षों का वर्ग करने पर
$y^2 = 6 + y \Rightarrow y^2 - y - 6 = 0$
$\Rightarrow y^2 - 3y + 2y - 6 = 0 \Rightarrow y(y - 3) + 2(y - 3) = 0$
$\Rightarrow (y - 3)(y + 2) = 0$
$\therefore y = 3$ या -2

49. (D) दिया गया व्यंजक = $\left[\left(\sqrt{2}\right)^{\sqrt{2}}\right]^{\sqrt{2}}\left(\sqrt{2}\right)^{2} = (2)^{2/2} = 2$

जो कि एक वास्तविक संख्या हैं किन्तु परिमेय संख्या नहीं हैं।

50. (D) दिया हैं $16 \times 8^{n+2} = 2^m \Rightarrow (2)^4 \times 2^{3(n+2)} = 3n + 10$

$\Rightarrow 2^{(4+3n+6)} = 2^m \Rightarrow 2^{(3n+10)} = 2^m$

$\Rightarrow 3n + 10 = m \quad [\because a^n = a^m \Rightarrow n = m]$

$\therefore m = 3n + 10$

51. (B) यहाँ, महत्तम तीनों अकों की संख्या = 999

अब,
$$\begin{array}{r|l} & 31 \\ \hline 3 & 9\ \ 99 \\ & 9 \\ \hline 61 & 099 \\ & 61 \\ \hline & 38 \end{array}$$

यहाँ तीन अंकों की महत्तम संख्या, जो कि पूर्ण वर्ग हैं

$= 999 - 38 = 961 = (31)^2$

$\therefore$ चार अंकों की न्यूनतम संख्या, जोकि पूर्ण वर्ग हैं

$= (31 + 1)^2 = (32)^2 = 1024$

52. (B) दिया हैं, $\sqrt{10 + \sqrt[3]{x}} = 4$

अब, दोनों पक्षों का घन करने पर

$x = (6)^3$

$x = 216$

53. (B) दिया हैं, $a = 2 + \sqrt{3}$

तब $\frac{1}{a} = 2 - \sqrt{3}$ [संयुग्मी गुण से]

अब $a^2 + a^{-2} - \sqrt{3}$

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

$= (4)^2 - 2 = 16 - 2 = 14$

54. (D) दिया हैं, $196x^4 = x^6$

$\Rightarrow \left(\frac{x^3}{x^2}\right) = 196 = (14)^2 \Rightarrow \frac{x^3}{x^2} = 14$

$\therefore x^3 = 14x^2$

55. (C) $\left(15 + \sqrt{200}\right)$ और $\left(27 - \sqrt{648}\right)$ का मध्यानुपाती

$= \sqrt{\left(15 + \sqrt{200}\right)\left(27 - \sqrt{648}\right)}$

$= \sqrt{\left(15 + 10\sqrt{2}\right)\left(27 - 18\sqrt{2}\right)}$

$= \sqrt{405 + 270\sqrt{2} - 270\sqrt{2} - 360}$

$= \sqrt{45} = 3\sqrt{5}$

56. (C) विकल्प (C) से $4x^3 - 3x^2 + 2x - 1$

$= (4x^3 - 3x^2)^2 + (2x - 1)^2 + 2(4x^3 - 3x^2)(2x - 1)$

$= 16x^6 + 9x^4 - 24x^5 + 4x^2 + 1 - 4x$

$\quad + 2(8x^4 - 6x^3 - 4x^3 + 3x^2)$

$= 16x^6 + 9x^4 - 24x^5 + 4x^2 + 1 - 4x$

$\quad + 16x^4 - 12x^3 - 8x^3 + 6x^2$

$= 16x^6 - 24x^5 + 25x^4 + 20x^3 + 10x^2 - 4x + 1$

57. (B) $\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} + \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}}$

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

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

$= \frac{16}{5 - 3} = \frac{16}{2} = 8$

58. (D) $\frac{\sqrt{0.0032}}{0.32} = \frac{\sqrt{\frac{32}{10000}}}{\sqrt{\frac{32}{100}}}$

$= \frac{\sqrt{32}}{\sqrt{32}} \times \frac{10}{100} = \frac{1}{10} = 0.1$

59. (C) दिया हैं, $2^m + 2^{1+m} = 24$

$\Rightarrow 2^m + 2^1 . 2^m = 24 \Rightarrow 2^m (1 + 2^1) = 24$

$\Rightarrow 2^m . 3 = 24 \Rightarrow 2^m = 8 = 2^3$

$\therefore m = 3 \quad [\because a^m = a^n \Rightarrow m = n]$

60. (D) हम जानते हैं कि, पूर्ण संख्या 1849 जो 43×43 हैं, के ठीक पहले दी गई पूर्ण वर्ग संख्या $1764 = 42 \times 42$ होगी। चूँकि संख्या 1780 में हमें वह न्यूनतम संख्या का योग करना है जिससे यह पूर्ण वर्ग बन जाए।

$\therefore$ अभीष्ट संख्या = $1849 - 1780 = 69$

61. (D) $\frac{0.324 \times 0.64 \times 129.6}{0.729 \times 1.024 \times 36} = \sqrt{\frac{324 \times 64 \times 1296}{729 \times 1024 \times 36}}$

$= \frac{18 \times 8 \times 36}{27 \times 32 \times 6} = 1$

62. (D) $9 - 2\sqrt{14} = \sqrt{7 + 2 - 2 \times \sqrt{7} \times \sqrt{2}}$

$= \sqrt{\left(\sqrt{7} - \sqrt{2}\right)^2} = \sqrt{7} - \sqrt{2}$

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63. (A) दिया हैं $3^x \times 27^x = 9^{x+4}$

$\therefore \; 3^x \times 3^{3x} = 3^{2(x+4)} \Rightarrow 3^{x+3x} = 3^{2(x+4)}$

$\Rightarrow x + 3x = 2(x + 4)$ [$\because a^m = a^n \Rightarrow m = n$]

$\Rightarrow 4x = 2x + 8$

$\therefore x = \frac{8}{2} = 4$

64. (C) $\frac{1}{\sqrt{9}-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-\sqrt{4}}$

$= \frac{\sqrt{9}+\sqrt{8}}{9-8} - \frac{\sqrt{8}-\sqrt{7}}{8-7} + \frac{\sqrt{7}-\sqrt{6}}{7-6} - \frac{\sqrt{6}+\sqrt{5}}{6-5} + \frac{\sqrt{5}+\sqrt{4}}{5-4}$ [परिमेयीकरण करने पर]

$= (\sqrt{9}+\sqrt{8}) - (\sqrt{8}+\sqrt{7}) + (\sqrt{7}+\sqrt{6}) - (\sqrt{6}+\sqrt{5}) + (\sqrt{5}+\sqrt{4})$

$= \sqrt{9} + \sqrt{8} - \sqrt{8} - \sqrt{7} + \sqrt{7} + \sqrt{6} - \sqrt{6} - \sqrt{5} + \sqrt{5} + \sqrt{4}$

$= \sqrt{9} + \sqrt{4} = 3 + 2 = 5$

65. (A) दिया हैं $p^x = r^y \Rightarrow r = p^{x/y}$

तथा $p^z = r^w \Rightarrow r = p^{z/y}$

सभी (i) व (ii) से

$p^{x/y} = p^{z/w} \Rightarrow \frac{x}{y} = \frac{z}{w}$

$\Rightarrow xw = yz$

66. (D)

$\sqrt{29.16} + \sqrt{0.2916} + \sqrt{0.002916} + \sqrt{0.00002916}$

$\sqrt{\frac{2916}{100}} + \sqrt{\frac{2916}{10000}} + \sqrt{\frac{2916}{1000000}} + \sqrt{\frac{2916}{100000000}}$

$= \frac{54}{10} + \frac{54}{100} + \frac{54}{1000} + \frac{54}{10000}$

$= 5.4 + 0.54 + 0.054 + 0.0054$

$= 5.9994$

Notes

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