Solutions

S1. Ans.(d)

$\frac{1}{35}+\frac{1}{63}+\frac{1}{99}+\frac{1}{143}+\frac{1}{195}$

$=\frac{1}{5\times7}+\frac{1}{9\times7}+\frac{1}{9\times11}+\frac{1}{11\times13}+\frac{1}{13\times15}$

$=\frac{1}{2}\left[\frac{1}{5}-\frac{1}{7}+\frac{1}{7}-\frac{1}{9}+\frac{1}{9}-\frac{1}{11}+\frac{1}{11}-\frac{1}{13}+\frac{1}{13}-\frac{1}{15}\right]$

$=\frac{1}{2}\left[\frac{1}{5}-\frac{1}{15}\right]=\frac{1}{15}$

S2.Ans(c)

Sol: LCM of (8, 15, and 18) = 360

Minimum number added to make it perfect cube = 360 + 152 = 512

Sum of digit of number which is added = 1+ 5 + 2 = 8

S3.Ans(b)

Sol: LCM of (5, 8, 12 and 15) = 120

For the greatest 4 digit number = 120k + 4

put k = 83

= 120 × 83 + 4

= 9964

S4. Ans.(c)

Sol. 509xy0 divisible by 3 if sum of digits

Divisible by 3 $\Longrightarrow \frac{5+9+x+y}{3}=\frac{14+x+y}{3}$ ________ (1)

Divisible by 11 $\Longrightarrow$ 5 + 9 + y - x = 11 $\Longrightarrow$ x - y = 3 ___________ (1)

Now from (1) x + y = 7, x - y = 3

x = 5,   y = 2

The number is 509520

S5. Ans.(c)
Sol. 9digit number will be divisible by factor of 36, by 9 and 4.
For divisible by 4
Largest possible value of Y = 8
Now for divisible by 9
$\frac{2+x+2+1+2+3+7+8+4}{9} = \frac{29+x}{9}$
Possible value of x = 7
Now,
$11x^2 - 5y^2 = 11 \times 49 - 5 \times 64$
= 539 – 320
= 219

S6. Ans.(c)
Sol. L.C.M of (3, 7, 11) = 237
Let the maximum number divisible by 231 is 11799,

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231)11799(57
    1155
    ----
     249
     231
     ---
      18
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Maximum number divisible
= 11799 – 18
= 11781
x = 8, y = 1
Now, (x + y)
= 8 + 1 = 9

S7. Ans.(c)
Sol.
$$\frac{17}{60} = \frac{1}{\frac{60}{17}} \Rightarrow \frac{1}{3+\frac{9}{17}} \Rightarrow \frac{1}{3+\frac{1}{1+\frac{8}{9}}} \Rightarrow \frac{1}{3+\frac{1}{1+\frac{1}{\frac{9}{8}}}} = \frac{1}{3+\frac{1}{1+\frac{1}{1+\frac{1}{8}}}}$$

On Comparing both

$$\frac{1}{a+\frac{1}{b+\frac{1}{c+\frac{1}{8}}}} = \frac{1}{3+\frac{1}{1+\frac{1}{1+\frac{1}{8}}}}$$

a = 3, b = 1, c = 1

Now,

(a + b + c) = (3 + 1 + 1) = 5

S8. Ans.(c)

Sol. L.C.M of (3, 7 and 11) = 231

Let the largest five-digit number = 10399

231) 10399 (45
     924
      1159
      1155
         4 Remainder

P now, largest five-digit no.

= 10399 – 4 = 10395

a = 9, b = 5

Now,

$(a + b)^3 = a^3 + b^3 + 3ab\ (a + b)$

$= (9 + 5)^3 = 14^3 = 2744$

S9. Ans.(d)

Sol. [168, 210, 264]

210 – 168 = 42 = 2 × 3 × 7

$264 - 210 = 54 = 2 \times 3^3$

$264 - 168 = 96 = 2^5 \times 3$

HCF of 42, 54 and 96 be 2 × 3 = 6

Now,

Remainder when 168 is divided by 6 is 0

So, x = 6 and y = 0

Then $\frac{y}{x} = \frac{0}{6} = 0$

S10. Ans.(d)
Sol.
Let the No. be
P = 21 × 1 + 4 = 25
Q = 21 × 1 + 9 = 30
R = 21 × 1 + 8 = 29
Now,
$\frac{(9P-3Q+5R)}{21}$
$= \frac{9\times25-3\times30+5\times29}{21}$
$= \frac{280}{21}$ = 7 Remainder
S11. Ans.(d)
Sol. $\sqrt{14 + 6\sqrt{5}} = \sqrt{9 + 5 + 2.3\sqrt{5}}$
$= \sqrt{(3)^2 + (\sqrt{5})^2 + 2.3\sqrt{5}}$
$= \sqrt{(3 + \sqrt{5})^2}$
$= 3 + \sqrt{5}$

S12. Ans.(c)
Sol. Let the required number is x.
$(7)^{-1} \times x = (3)^3$
$\frac{x}{7} = 27 \Longrightarrow x = 189$

S13. Ans.(c)
Sol. Let the number is x
$(-39)^{-1} \div x = (-13)^{-1}$
$\frac{(-39)^{-1}}{(-13)^{-1}} = x \Longrightarrow \frac{1}{(-39)} \times (-13)$

x = $\frac{1}{3}$

S14. Ans.(d)
Sol.

$$\sqrt[3]{\left(\frac{11}{5}\right)^{x+2}} = \frac{121}{25}$$

$$\left(\frac{11}{5}\right)^{\frac{x+2}{3}} = \left(\frac{11}{5}\right)^2$$

$\frac{x+2}{3}$ = 2 $\Longrightarrow$ x + 2 = 6
x = 4

S15. Ans.(a)
Sol.

$$\left(\frac{1}{(5)^2 \times (7)^2}\right)^{\frac{x}{2}} = \left(\frac{1}{35}\right)^1$$

$$\left(\frac{1}{35}\right)^{\frac{2x}{2}} = \left(\frac{1}{35}\right)^1$$

x = 1