S36. Ans.(b)

Sol.

Required ratio

$$= \frac{\frac{10}{100} \times 400 + \frac{10}{100} \times 250}{\frac{8}{100} \times 500 + \frac{10}{10} \times 360}$$

$$= 65 : 76$$

S37. Ans.(a)

Sol.

Required average

$$\frac{\frac{8}{100} \times 500 + \frac{6}{100} \times 400 + \frac{10}{100} \times 360 + \frac{12}{100} \times 250}{4}$$

$$= \frac{130}{4} = \frac{65}{2} = 32\frac{1}{2}$$

S38. Ans.(c)

Sol.

Students participating in dance from Class VII

$$= \frac{60}{100} \times 400 = 40$$

Students participating in play from class IX

$$= \frac{12}{100} \times 250 = 30$$

Required percentage

$$= \frac{10}{30} \times 100 = \frac{100}{3}\% = 33\frac{1}{3}\%$$

S39. Ans.(d)

Sol.

Students who don't participate in dance and play from class VI

$$= 500 - (15\% + 8\%) of\ 500$$

$$= 500 - \frac{23}{100} \times 500$$

$$= 500 - 115$$

$$= 385$$

Students who do not participate in dance and play in class IX

$$= 250 - (10\% + 12\%) \times 250$$

$$= 250 - 55$$

$$= 195$$

Required sum = 195 + 385

= 580

S40. Ans.(a)

Sol.

Students who participate only in dance from class VI

$$= \frac{15}{100} \times 500 - \frac{20}{100} \times \frac{15}{100} \times 500$$

$$= 75 - \frac{1}{5} \times 75$$
$$= 60$$
Students who participate only in play from class VI
$$= \frac{8}{100} \times 500 - 15$$
= 40 – 15
= 25
Required ratio = 60 : 25
= 12 : 5

S41. Ans.(d)
Sol.
Required ratio
$$= \frac{\frac{10}{100} \times 400}{\frac{12}{100} \times 250} \times 100$$
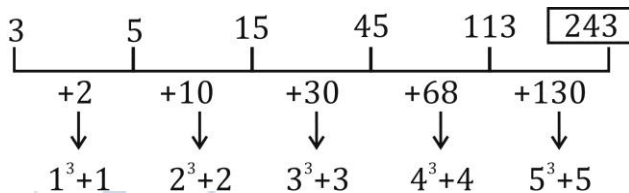$$= \frac{10 \times 400}{12 \times 250} \times 100 = 133\frac{1}{3}\%$$

S42. Ans.(d)
Sol.

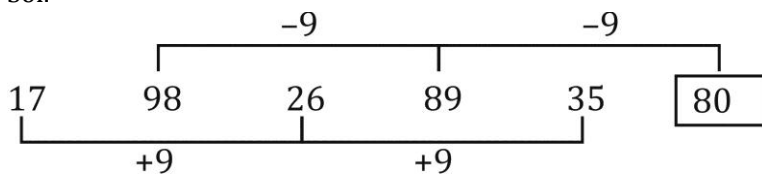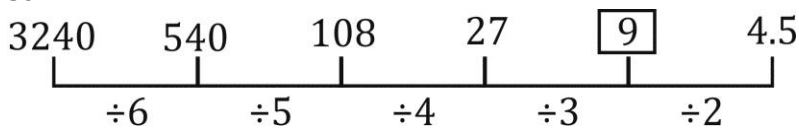3   5   15   45   113   [243]

+2   +10   +30   +68   +130

1^3+1 2^3+2 3^3+3 4^3+4 5^3+5

S43. Ans.(c)
Sol.

−9   −9

17   98   26   89   35   [80]

+9   +9

S44. Ans.(c)
Sol.

3240   540   108   27   [9]   4.5

÷6   ÷5   ÷4   ÷3   ÷2

S45. Ans.(a)
Sol.

7   4.5   5.5   12   49   [393]

×0.5+1   ×1+1   ×2+1   ×4+1   ×8+1
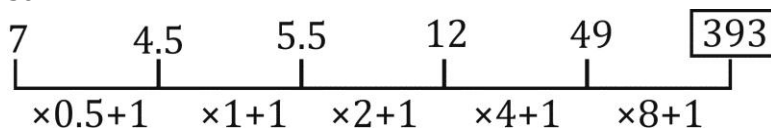
S46. Ans.(d)
Sol.

2	17	89	359	1079	$\boxed{2159}$

$\times 6+5 \qquad \times 5+4 \qquad \times 4+3 \qquad \times 3+2 \qquad \times 2+1$

S42. Ans.(b)

Sol.

(i) $x^2 - 3x - 2x + 6 = 0$

$x(x - 3) - 2(x - 3) = 0$

$(x - 2)(x - 3) = 0$

$x = 2, 3$

(ii) $3y^2 + 3y - 18 = 0$

$3y^2 + 9y - 6y - 18 = 0$

$3y(y + 3) - 6(y + 3) = 0$

$y = -3, 2$

$x \geq y$

S43. Ans.(a)

Sol.

(i) $x^2 - 11x + 30 = 0$

$x^2 - 6x - 5x + 30 = 0$

$x(x - 6) - 5(x - 6) = 0$

$(x - 6)(x - 5) = 0$

$x = 6, 5$

(ii) $y^2 + y - 20 = 0$

$y^2 + 5y - 4y - 20 = 0$

$y(y + 5) - 4(y + 5) = 0$

$(y - 4)(y + 5) = 0$

$y = +4, -5 \ ; x > y$

S44. Ans.(d)

Sol.

(i) $2x^2 + 2x - 4 = 0$

$2x^2 + 4x - 2x - 4 = 0$

$2x(x + 2) - 2(x + 2) = 0$

$x = -2, 1$

(ii) $y^2 - 5y + 4 = 0$

$y^2 - 4y - y + 4 = 0$

$y(y - 4) - 1(y - 4) = 0$

$y = 4, 1$

$x \leq y$

S45. Ans.(e)

Sol.

(i) $x^2 + 6x - 16 = 0$

$x^2 + 8x - 2x - 16 = 0$
$x(x + 8) - 2(x + 8) = 0$
$(x - 2)(x + 8) = 0$
$x = 2, -8$

(ii) $y^2 - 6y + 5 = 0$

$y^2 - 5y - y + 5 = 0$

$y(y - 5) - 1(y - 5) = 0$

$y = 5, 1$
No relation can be established

S46. Ans.(c)

Sol.

(i) $x^2 - 4 = 0$

$(x + 2)(x - 2) = 0$

$x = +2, -2$

(ii) $y^2 - 9y + 20 = 0$

$$y^2 - 5y - 4y + 20 = 0$$

$$y(y - 5) - 4(y - 5) = 0$$

$$(y - 4)(y - 5) = 0$$

$$y = 4, 5$$

$y > x$

S47. Ans.(b)
Sol.
≈ (9 – 5) × (11 + 4) = ?
≈ ? = 60

S48. Ans.(a)
Sol.
$\approx 55 - \frac{345}{23} = 2 \times ?$
≈ ? = 20

S49. Ans.(b)
Sol.

$$\approx \sqrt{\frac{3100}{62} + 14}$$
$$\approx \sqrt{50 + 14}$$
$$\approx 8$$

S50. Ans.(d)
Sol.
≈ (112 × 5) ÷ 14 = 11+ ?
≈ 40 − 11 = ?
≈ ? = 29

S51. Ans.(a)
Sol.
$$\approx \frac{25}{100} \times \frac{84}{7} = ?$$
≈ ? = 3

S52. Ans.(d)
Sol.
$$\approx \left(184 - \frac{29}{5}\right) \times 30 = ?$$
$$\approx \left(\frac{184 \times 5 - 29}{5}\right) \times 30 = ?$$
$$\approx \frac{891}{5} \times 30$$
$$\approx ? = 5346$$
$$\approx 5340$$

S53. Ans.(c)
Sol.
At present sum of age = 76
After 7 years sum of age will be
7x + 6x+ 5x+ 8x = 76 + 7 × 4

26x = 76 + 28

$$x = \frac{104}{26}$$

x = 4

C's present age = 5x – 7

= 20 – 7

= 13

S54. Ans.(b)

Sol.

Sum of length of train = 660

$l_1 + l_2 = 660$

$S_A : S_B = 5 : 8$

Let speed be 5x and 8x

And time taken to cross pole be 4y, 3y

So,

5x × 4y + 8x + 3y = 660

44xy = 660

xy = 15

$l_1 - l_2 = 24xy - 20xy$

= 4xy

⇒ 60

S55. Ans.(a)

Sol.

40% of new mixture = 20L

$$100\% \text{ of new mixture} = \frac{20}{40} \times 100$$

= 50 L

28 + x + 8 + x = 50

2x = 50 – 36

x = 7L

S56. Ans.(d)

sol.

Time taken by A in completing 1/3 of work

$$= 24 \times \frac{1}{3} = 8 \; days$$

8 day = time taken by B in completing 1/2 of work

B alone will complete the work = 16 days

Required time

$$= \frac{16 \times 24}{40} = \frac{48}{5} \text{ days}$$

S57. Ans.(e)

Sol.

MP = 1600 + CP   ....(i)

$$MP - 500 = \frac{125}{100} \times CP$$

$$MP = \frac{5}{4} CP + 500$$

4MP = 5CP + 2000   ...(ii)

Solving (i) and (ii)

CP = 4400

Required selling price $= \frac{130}{100} \times 4400$
= 5720

S58. Ans.(a)
Sol.
Let d=4x and h = 3x
Total surface area of right circular cylinder is 2πr (r +h)
$$\begin{bmatrix} \text{Where } r \to \text{radius} \\ h \to \text{height} \end{bmatrix}$$
$\therefore 2\pi \left[2x(2x + 3x) - \frac{3x}{2}\left(\frac{3x}{2} + 3x\right) \right] = 318.5\pi$
$2 [10x^2 - 6.75x^2] = 318.5$
$6.5x^2 = 318.5$
$x^2 = 49$
$x = \pm 7$
$\therefore$ radius (r) = 14
height (h) = 21
$\therefore$ Circumference of base of cylinder
= 2πr
= 28π cm²

S59. Ans.(b)
Sol.
Let digit be xyz
So,
According to question
y = 3
$(100z - 10y - x) - (100x - 10y - z) = 396x$
$99z - 99x = 396$
$z - x = 4$
And it is given that
z + x = 14   ...(ii)
Solving (i) & (ii)
z = 9
x = 5
so, number is = 539

S60. Ans.(b)
Sol.
Let 4 consecutive even number is
x, x+ 2, x+ 4, x+ 6
$\frac{1}{x} + \frac{1}{x + 2} = \frac{11}{60}$
$\frac{x + 2 + x}{x(x + 2)} = \frac{11}{60}$
$\frac{2(x + 1)}{x^2 + 2x} = \frac{11}{60}$
$120x + 120 = 11x^2 + 22x$
$11x^2 - 98x - 120 = 0$

$$x = \frac{-24}{22}, 10$$
$$= -\frac{12}{11}, 10$$

∴ third number is 14 and reciprocal 3rd highest no. is $\frac{1}{14}$.

S61. Ans.(d)
Sol.
Profit will be shared in ratio
$$= 12 \times 6 : 8 \times \left(\frac{9}{8} \times 8\right) : 9 \times 12$$
$$= 12 \times 6 : 8 \times 9 : 9 \times 12$$
$$= 2 : 2 : 3$$
C's profit $= \frac{16750}{2} \times 3 = 25125$

S62. Ans.(a)
Sol.
Downstream speed $= \frac{18}{3} = 6$ km/hr
or $x + y = 6$ (when $x \rightarrow$ speed of boat in Still water, $y \rightarrow$ speed of current)
speed of current $= \frac{1}{3} \times 6 = 2$ km/hr
Speed of boat in still water = 4 km/hr
Required time $= \frac{100}{(4-2)} = 50$ hour

S63. Ans.(b)
Sol
Let M.P. = x
And cost price and selling price be 5y and 6y
So,
$80\% x = 6y$
$$x = \frac{30y}{4}$$
$x = 7.5y$
Required percentage $= \frac{7.5y - 5y}{5y} \times 100$
$$= \frac{2.5y}{5y} \times 100$$
$= 50\%$

S64. Ans.(d)
Sol.
Total expenditure = 80% of salary
Expenditure excluding clothing
$$= 80\% - \frac{25}{100} \times 80\%$$
$= 60\%$ of savings
Ramesh savings $= \frac{3600}{60} \times 20 = 1200\ Rs$

S65. Ans.(d)
Sol
Total no. of hats sold on Wednesday
= 64 + 48 = 112
Total no. of hats sold on Tuesday

= 60 + 36 = 96

Desired Percentage = $\frac{112-96}{96} \times 100$

= $16\frac{2}{3}$ %

S66. Ans.(b)
Sol.
No. of hats sold on Friday by A after increase = $56 \times \frac{8}{7}$
= 64
Average no. of hats sold on Monday, Wednesday and Friday by A
= $\frac{46 + 64 + 64}{3}$
= $\frac{174}{3}$ = 58

S67. Ans.(e)
Sol.
No. of hats sold on Saturday
= $112 \times \frac{15}{14}$ = 120

S68. Ans.(c)
Sol.
No. of hats sold on Monday & Wednesday by B
= 34 + 48 = 82
No. of hats sold on Friday by A and B together
= 56 + 40 = 96
Desired Difference = 96 − 82 = 14

S69. Ans.(a)
Sol.
Hats sold on Thursday that are not defected
= $\frac{20}{100} \times 60 + \frac{25}{100} \times 52$
12 + 13 = 25

S70. Ans.(b)
Sol.
No. of hats sold on Tuesday & Friday by A
= 36 + 56 = 92
No. of hats sold on Tuesday & Friday by B
= 60 + 40 = 100
Desired Ratio = 92 : 100 = 23 : 25