26. (1) $x \times \frac{15}{100} = y \times \frac{20}{100}$

$\Rightarrow x \times 15 = y \times 20$

$\Rightarrow \frac{x}{y} = \frac{20}{15} = \frac{4}{3} = 4 : 3$

27. (1) Boys in school = $2x$

Girls = $3x$

Students who are not scholarship holders :

Boys $\Rightarrow \frac{2x \times 75}{100} = \frac{6x}{4}$

Girls $\Rightarrow \frac{3x \times 70}{100} = \frac{21x}{10}$

Total students who donot hold scholarship = $\frac{6x}{4} + \frac{21x}{10}$

$= \frac{30x + 42x}{20} = \frac{72x}{20} = \frac{18x}{5}$

$\therefore$ Required percentage

$= \frac{\frac{18x}{5}}{5x} \times 100 = 72\%$

28. (1) Numbers $\Rightarrow$ A and B

$\therefore \frac{A \times 5}{100} + \frac{B \times 4}{100}$

$= \frac{2}{3}\left(\frac{A \times 6}{100} + \frac{B \times 8}{100}\right)$

$\Rightarrow 5A + 4B = \frac{12A + 16B}{3}$

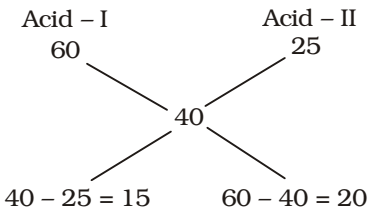
$\Rightarrow 15A + 12B = 12A + 16B$

$\Rightarrow 15A - 12A = 16B - 12B$

$\Rightarrow 3A = 4B$

$\Rightarrow \frac{A}{B} = \frac{4}{3} = 4 : 3$

29. (3) By alligation,



$\therefore$ Required ratio = 15 : 20

= 3 : 4

30. (4) 50% of x = 30% of y

$\Rightarrow \frac{x \times 50}{100} = \frac{y \times 30}{100}$

$\Rightarrow \frac{x}{y} = \frac{30}{50} = \frac{3}{5} = 3 : 5$

31. (2) Boys in the village = $3x$

Girls in the village = $2x$

Villagers who appeared in the examination

$= \frac{3x \times 30}{100} + \frac{2x \times 70}{100}$

$= \frac{9x}{10} + \frac{14x}{10} = \frac{23x}{10}$

Villagers who did not appear in the examination

$= \frac{3x \times 70}{100} + \frac{2x \times 30}{100}$

$= \frac{21x}{10} + \frac{6x}{10} = \frac{27x}{10}$

$\therefore$ Required ratio = $\frac{23x}{10} : \frac{27x}{10}$

= 23 : 27

32. (4) C.P. of 1 litre of milk= Rs. 100

$\therefore$ Mixture sold for Rs. 125

$= \frac{125}{100} = \frac{5}{4}$ litre

$\therefore$ Quantity of water = $\frac{5}{4} - 1$

$= \frac{1}{4}$ litre

$\therefore$ Required ratio = $\frac{1}{4} : 1$

= 1 : 4

33. (1) Percentage of syrup

$= \frac{3}{4} \times 100 = 75\%$

34. (1) Let the numbers be $5x$ and $4x$ respectively

According to the question,

$5x \times \frac{40}{100} = 12$

$\Rightarrow 2x = 12 \Rightarrow x = 6$

$\therefore$ $4x$ का 50% = $4 \times 6 \times \frac{1}{2} = 12$

35. (2) According to the question,

$x \times \frac{10}{100} = 3 \times y \times \frac{15}{100}$

$\Rightarrow 10x = 45y$

$\Rightarrow \frac{x}{y} = \frac{45}{10} = \frac{9}{2}$

36. (2) Required per cent

$= \frac{11}{10} \times 100 = 110\%$

37. (2) Let the number of students in school be 100.

Boys $\Rightarrow$ 60

Girls $\Rightarrow$ 40

Students who do not hold scholarship :

Boys $\Rightarrow \frac{60 \times 80}{100} = 48$

Girls $\Rightarrow \frac{40 \times 75}{100} = 30$

Required answer = 48 + 30

= 78 i.e., 78%

38. (2) According to the question,

A × 35% = B × 25%

$\Rightarrow \frac{A}{B} = \frac{25}{35} = \frac{5}{7}$

TYPE-V

1. (2) Glycerine in mixture

= 40 litres

Water = 10 litres

Let x litres of pure glycerine is mixed with the mixture.

$\therefore \frac{40 + x}{50 + x} = \frac{95}{100} = \frac{19}{20}$

$\Rightarrow 800 + 20x = 950 + 19x$

$\Rightarrow x = 950 - 800 = 150$ litres.

2. (4) Alcohol in original solution

$= \frac{40}{100} \times 5 = 2$ litres

Water in original solution

= 3 litres

On adding 1 litre water, water becomes 4 litres.

Now, 6 litres of solution contains 2 litres of alcohol.

$\therefore$ 100 litres of solution contains

$= \frac{2}{6} \times 100$

$= \frac{100}{3} = 33\frac{1}{3}\%$ alcohol.

3. (1) In 12 litres salt solution,

$\text{Salt} = \frac{7 \times 12}{100} = 0.84$ units

$\text{Water} = \frac{93 \times 12}{100} = 11.16$ units

After evaporation,
Percentage of salt

$= \frac{0.84}{8} \times 100 = 10.5\,\%$

4. (2) In 60 litres of solution, Water

$= \frac{60 \times 20}{100}$ = 12 litres

On adding x litres of water,

$\frac{12 + x}{60 + x} \times 100 = 40$

$\Rightarrow 60 + 5x = 120 + 2x$
$\Rightarrow 3x = 60$
$\Rightarrow x = 20$ litres

5. (2) Sugar in original solution

$= \frac{75 \times 30}{100} = 22.5$ gm

Let x gm of sugar be mixed.

$\therefore \frac{22.5 + x}{75 + x} \times 100 = 70$

$\Rightarrow 2250 + 100x = 75 \times 70 + 70x$
$\Rightarrow 2250 + 100x = 5250 + 70x$
$\Rightarrow 30x = 5250 - 2250 = 3000$

$\Rightarrow x = \frac{3000}{30} = 100$ gm

6. (3) In 30% alcohol solution,

$\text{Alcohol} = \frac{30}{100} \times 6 = 1.8$ litres

Water = 4.2 litres
On mixing 1 litre of pure alcohol,
Percentage of water

$= \frac{4.2}{7} \times 100 = 60\%$

7. (2) In 4 kg of ore, iron = 0.9 kg.
$\therefore$ Quantity of ore for 60 kg of iron

$= \frac{60 \times 4}{0.9}$

= 266.67 kg

8. (4) Let x ml of water be added.

$\therefore \frac{20 + x}{100 + x} \times 100 = 50$

$\Rightarrow 40 + 2x = 100 + x$
$\Rightarrow x = 60$ ml

9. (1) In 1 litre i.e. 1000 ml of mixture,
Alcohol = 700 ml.
Water = 300 ml.
Let x ml of alcohol is mixed.

$\therefore \frac{300}{1000 + x} \times 100 = 15$

$\Rightarrow 1000 + x = 2000$
$\Rightarrow x = 1000$ ml.

10. (4) In 10 litres of first type of liquid,

$\text{Water} = \frac{1}{5} \times 10 = 2$ litres

In 4 litres of second type of liquid,

$\text{Water} = 4 \times \frac{35}{100} = \frac{7}{5}$ litres

Total amount of water

$= 2 + \frac{7}{5} = \frac{17}{5}$ litres

Required percentage

$= \frac{\frac{17}{5}}{14} \times 100$

$= \frac{170}{7} = 24\frac{2}{7}\%$

11. (4) Water content in 40 litres of

$\text{mixture} = 40 \times \frac{10}{100}$

= 4 litres
$\therefore$ Milk content = 40 – 4
= 36 litres
Let x litres of water is mixed.

Then, $\frac{4 + x}{40 + x} = \frac{20}{100}$

$\Rightarrow \frac{4 + x}{40 + x} = \frac{1}{5}$

$\Rightarrow 20 + 5x = 40 + x$
$\Rightarrow 4x = 20 \Rightarrow x = 5$ litres

12. (2) $\text{Alcohol} = \left(\frac{15}{100} \times 400\right)$ml

= 60 ml.
Water = 340 ml.
Let x ml of alcohol be added.

Then, $\frac{60 + x}{400 + x} \times 100 = 32$

or $\frac{60 + x}{400 + x} = \frac{32}{100} = \frac{8}{25}$

or $1500 + 25x = 3200 + 8x$
or $17x = 1700$
or $x = 100$ ml

13. (2) Initial quantity of gold

$= \frac{50 \times 80}{100} = 40$ gm

Let 'x' gm be mixed.

$(40 + x) = (50 + x) \times \frac{95}{100}$

$\Rightarrow 40 + x = (50 + x) \times \frac{19}{20}$

$\Rightarrow 800 + 20x = 950 + 19x$
$\Rightarrow x = 150$ gm

14. (3) In 200 litres of mixture,

Quantity of milk $= \frac{85}{100} \times 200$

= 170 litres
Quantity of water = 30 litres
Let the quantity of additional milk added be x litres.
According to the question,

$\frac{170 + x}{200 + x} \times 100 = 87.5$

$\Rightarrow (170 + x) \times 100$
$= 17500 + 87.5x$
$\Rightarrow 100x - 87.5x$
$= 17500 - 17000$
$\Rightarrow 12.5x = 500$

$\Rightarrow x = \frac{500}{12.5} = 40$ litres

15. (2) Let x litres of first mixture is mixed with y litres of the second mixture.
According to the question,

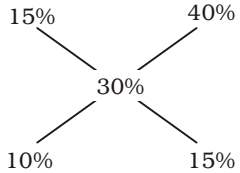
$\frac{x \times \frac{30}{100} + y \times \frac{50}{100}}{x \times \frac{70}{100} + y \times \frac{50}{100}} = \frac{45}{55}$

$\Rightarrow \frac{0.3x + 0.5y}{0.7x + 0.5y} = \frac{9}{11}$

$\Rightarrow 6.3x + 4.5y = 3.3x + 5.5y$
$\Rightarrow 6.3x - 3.3x = 5.5y - 4.5y$
$\Rightarrow 3x = y$

$\Rightarrow \frac{x}{y} = 1:3$

16. (1) Solution I Solution II



$\therefore$ Required ratio = 10 : 15 = 2 : 3

17. (2) Alcohol $= 15 \times \frac{1}{5} = 3$ litres

Water $= 15 \times \frac{4}{5} = 12$ litres

$\therefore$ Required percentage

$= \frac{3}{15+3} \times 100$

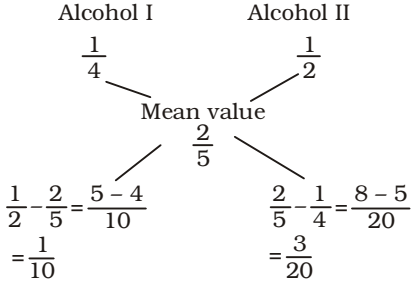
$= \frac{50}{3} = 16\frac{2}{3}\%$

18. (2) $\because$ 12 kg copper is contained in 100 kg of alloy

69 kg copper is contained in

$\therefore \frac{100}{12} \times 69 = 575$ kg of alloy

19. (3)



$\therefore$ Required ratio $= \frac{1}{10} : \frac{3}{20}$

$= 2 : 3$

20. (2) In 20 litres of mixture,

Alcohol $\Rightarrow \frac{20 \times 20}{100} = 4$ litres

Water $\Rightarrow$ 20 - 4 = 16 litres

On adding 4 litres of water,

Quantity of water $\Rightarrow 16 + 4$

$= 20$ litres

Quantity of mixture = 24 litres

$\therefore$ Required per cent

$= \frac{4}{24} \times 100 = \frac{50}{3} = 16\frac{2}{3}\%$

21. (3) In 300 gm of solution,

Sugar $= \frac{300 \times 40}{100} = 120$ gm.

Let x gm of sugar be mixed.

According to the question,

$\frac{120 + x}{300 + x} = \frac{1}{2}$

$\Rightarrow 240 + 2x = 300 + x$

$\Rightarrow 2x - x = 300 - 240$

$\Rightarrow x = 60$ gm.

22. (2) Quantity of sugar in the solution $= \frac{3 \times 60}{100} = 1.8$ units

On adding 1 litre of water,

$\therefore$ Required percent

$= \frac{1.8}{4} \times 100 = 45\%$

23. (2) In 32 litres of solution,

Alcohol $= \frac{32 \times 20}{100} = 6.4$ litres

Water $= 32 - 6.4 = 25.6$ litres

On adding 8 litres of water,

Required percent $= \frac{6.4}{40} \times 100 =$ 16%

TYPE-VI

1. (3) Using Rule 8,

Tricky approach

Required percentage decrease

$= \frac{\text{Increase}}{100 + \text{Increase}} \times 100$

$= \frac{20}{100 + 20} \times 100$

$= \frac{100}{6} = 16\frac{2}{3}\%$

2. (1) Using Rule 8,
Required answer

$= \frac{10}{(100 + 10)} \times 100$

$= \frac{10}{110} \times 100 = \frac{100}{11}\% = 9\frac{1}{11}\%$

3. (1) Using Rule 8,
Required reduction in consumption

$= \frac{x}{100 + x} \times 100\%$

where x = 25

$= \frac{25}{100 + 25} \times 100 = 20\%$

4. (3) Using Rule 8,
Reduction in consumption

$= \left\{\frac{R}{100 + R} \times 100\right\}\%$

$= \left(\frac{20}{120} \times 100\right)\%$

$= \frac{50}{3}\% = 16\frac{2}{3}\%$

5. (2) Let the CP of each article = ₹ 100 and consumption = 100 units
Initial expenditure
= ₹ (100 × 100) = ₹ 10000
New price of article = ₹ 80
Consumption = 120 units
Expenditure = ₹ (120 × 80)
= ₹ 9600
Decrease = ₹ (10000 – 9600)
= ₹ 400
$\therefore$ Percentage decrease

$= \frac{400 \times 100}{10000} = 4\%$

Aliter : Using Rule 3,
Required percentage decrease

$= \frac{20^2}{100}\%$

= 4% decreases

6. (2) Using Rule 8,
If the price of a commodity increases by R%, then reduction in consumption, not to increase the expenditure is given by

$\left(\frac{R}{100 + R} \times 100\right)\%$

$= \frac{15}{100 + 15} \times 100 = \frac{15}{115} \times 100$

$= \frac{300}{23} = 13\frac{1}{23}\%$

7. (2) Using Rule 8,
Required fractional decrease

$= \frac{R}{100 + R} = \frac{50}{100 + 50} = \frac{1}{3}$

8. (4) Using Rule 8,
Percentage decrease

$= \frac{25}{125} \times 100 = 20\%$

9. (4) Using Rule 9,
Required increase percent

$= \frac{40}{100 - 40} \times 100$

$= \frac{40}{60} \times 100 = \frac{200}{3} = 66\frac{2}{3}\%$