

10. PROFIT AND LOSS

Cost Price: The price at which an article is purchased, is called the cost price or CP.

Selling Price: The price at which an article is sold is called the selling price or SP.

Formulae:

$$\text{Gain or Profit} = \text{SP} - \text{CP}$$

$$\text{Gain \% or Profit \%} = \left(\frac{\text{gain}}{\text{cp}} \times 100\% \right) \text{ or } \left(\frac{\text{profit}}{\text{cp}} \times 100\% \right)$$

$$\text{SP} = \left(\frac{100 + \text{profit}\%}{100} \right) \times \text{CP}$$

Similarly,

$$\text{Loss} = \text{CP} - \text{SP}$$

$$\text{Loss \%} = \frac{\text{loss}}{\text{cp}} \times 100$$

$$\text{SP} = \frac{(100 - \text{loss}\%)}{100} \times \text{CP}$$

• The Profit and Loss per cent is always calculated on the cost price.

• If a trader professes to sell his goods at CP but uses false weight, then Gain per cent or Profit percent

$$= \left(\frac{\text{error}}{\text{true value} - \text{error}} \times 100 \right) \%$$

Marked Price or List Price:

Price that is indicated or marked on the article is called marked price or MP.

Discount:

It is reduction given on the Marked Price or List Price of an article.

$$\text{Discount \%} = \frac{\text{discount}}{\text{MP}} \times 100\%; \quad \text{Selling Price} = \frac{(100 - d)}{100} \times \text{MP}$$

If a trader gets $x\%$ profit and $x\%$ loss in **selling** two different articles, then in over all transaction, there is always a loss which is given by

$$\text{Loss\%} = \left(\frac{x}{2} \right)^2$$

Example 1: A chair is bought for Rs.1950 and sold at Rs.2340. Find the gain per cent.

Solution: CP = Rs. 1950 and SP = Rs. 2340

$$\text{Gain} = \text{Rs. } (2340 - 1950) = \text{Rs. } 390$$

$$\text{Gain \%} = \left(\frac{390}{1950} \times 100\% \right) = 20\%$$

Example 2: A radio is bought for Rs.780 and sold at Rs. 650. Find the loss per cent.

Solution: CP = Rs.780 and SP = Rs. 650

$$\text{Loss} = \text{CP} - \text{SP} = \text{Rs. } (780 - 650) = \text{Rs. } 130$$

$$\text{Loss \%} = \left(\frac{130}{780} \times 100 \right) \% = 16.67\%$$

Example 3: A book is bought for Rs.80 and sold at the gain of 5%. Find the selling price.

Solution: CP = Rs. 80, Gain = 5%

$$\text{SP} = 105\% \text{ of } 80 = \text{Rs. } \left(\frac{105}{100} \times 80 \right) = \text{Rs } 84$$

Example 4: If the cost price of 15 articles is equal to the selling price of 12 articles, then find the gain percent.

Solution. Let cost price of each article = Rs. 1

Then, Cost price of 15 articles = Rs. 15

Selling price of 12 articles = Rs.15

But Cost price of 12 articles = Rs.12

$$\text{Profit} = \text{Rs. } (15 - 12) = \text{Rs. } 3$$

$$\text{Profit \%} = \frac{3}{12} \times 100 = 25\%$$

Example 5: What is the equivalent discount of three consecutive discount 30%, 20% and 5%?

Solution: Let MP = Rs. 100

$$\text{SP} = 95\% \text{ of } 80\% \text{ of } 70\% \text{ of } 100 = \text{Rs. } 53.20$$

$$\text{Required equivalent discount} = \text{Rs. } (100 - 53.20) = \text{Rs. } 46.80$$

Example 6: By selling 66 m of cloth a person gains the cost price of 22 m. Find the gain percent.

Solution: Let CP of 1 m cloth = Rs. 1

$$\text{Gain \%} = \frac{\text{gain}}{\text{cp}} \times 100 = \frac{\text{cp of 22m cloth}}{\text{cp of 66m cloth}} \times 100 = \frac{22}{66} \times 100 = 33\frac{1}{3}\%$$

Example 7: A radio is listed at Rs. 500 with a discount of 10%. What additional discount must be offered to the customer to bring the net price to Rs.423?

Solution . List price = Rs. 500, Discount = 10%

$$\text{SP} = 90\% \text{ of Rs. 500} = \text{Rs. 450}$$

$$\text{Sale price} = \text{Rs. 423}$$

$$\text{Additional discount} = \left(\frac{27}{450} \times 100\right) \% = 6\%$$

EXERCISE

- If SP = Rs. 84, % gain = 20%, then CP = ?
(a) Rs. 60 (b) Rs. 65
(c) Rs. 70 (d) Rs. 75
- If CP = Rs. 20, % loss = 25%, then SP = ?
(a) Rs. 10 (b) Rs. 15
(c) Rs. 20 (d) Rs. 25
- A chair costing Rs. 400 has been sold for Rs. 300. The percentage loss was
(a) 20% (b) 25%
(c) 15% (d) 10%
- A watch costing Rs. 250 has been sold for Rs.300. The percentage profit was
(a) 20% (b) 15%
(c) 16 % (d) 25%
- A shopkeeper uses a weight of 960 g instead of 1000 g. What is his gain%?
(a) 4% (b) 6%
(c) $4\frac{1}{6}\%$ (d) $6\frac{1}{4}\%$
- By selling 18 chocolates, a vendor losses the selling price of 2 chocolates. Find his loss percent.
(a) 10% (b) 15%
(c) $10\frac{1}{3}\%$ (d) $15\frac{1}{4}\%$
- By selling an article for Rs.2250, a person losses 10%. Find his gain or loss per cent, if he sells it for Rs.3000.
(a) 20% gain (b) 20% loss
(c) 18% gain (d) 18% loss
- A man buys 25 oranges for Rs. 100. At what price did he sell each orange to get a gain of 30%?
(a) Rs 5.40 (b) Rs 5.20
(c) Rs 5.25 (d) Rs 5.45
- A man sold an article at a loss of 25%. If he sells the articles for Rs. 21 more, he would have got a gain of 10%. The CP of the article is
(a) Rs .56 (b) Rs. 84
(c) Rs. 60 (d) Rs. 92
- Find the single discount equivalent to two successive discounts 5% and 20%.
(a) 28% (b) 24%
(c) 25% (d) 20%
- A dishonest dealer professes to sell his goods at cost price, but he uses a false weight and he gained 25%. Find the false weight.
(a) 900 g (b) 800 g
(c) 850 g (d) 925 g
- A man sold two books at Rs. 24 each, on one he got a profit of 20% and on other, he lost 20% on the whole, he
(a) lost Rs 1 (b) gained Rs 1
(c) lost Rs 2 (d) gained Rs 2
- Ravi purchased a scooter at $\frac{11}{13}$ th of its marked price and sold it at 10% more than its marked price. His gain per cent is
(a) 24% (b) 27%
(c) 30% (d) 32%
- A man buys an article with 20% discount on its marked price. He makes a profit of 10% by selling it at Rs. 825. Find its marked price.
(a) Rs 985.25 (b) Rs 937.50
(c) Rs 925.50 (d) Rs 945.25
- A man sells 16 mangoes at a cost price of 20 mangoes, then percent age of his gain is
(a) 18% (b) 20%
(c) 25% (d) 16%
- An article sold for Rs. b yields $a\%$ profit. Find the cost price of the article.
(a) Rs. $\frac{100ab}{a+b}$ (b) Rs. $\frac{100b}{100+a}$
(c) Rs. $\frac{100a}{100+b}$ (d) Rs. $\frac{100ab}{a-b}$

17. A trader allows a discount of 10% on the marked price of an article. How much percentage above the cost price the article be marked to make a profit of 17%?
 (a) 25% (b) 30%
 (c) 28% (d) 24%
18. A person sells two articles at the same price. On one, he gets a profit of 25% and on the other, he losses 20%. Find his profit or loss per cent in the whole transaction.
 (a) $12\frac{1}{3}\%$ loss (b) $12\frac{1}{3}\%$ profit
 (c) $2\frac{18}{41}\%$ profit (d) $2\frac{18}{41}\%$ Loss
19. A cloth merchant professes to sell his material at a loss of 8%. But he measures 84 cm for a metre. Find his actual gain or loss per cent.
 (a) $9\frac{5}{11}\%$ gain (b) $9\frac{11}{21}\%$ loss
 (c) $8\frac{7}{21}\%$ gain (d) $8\frac{5}{21}\%$ loss
20. An article is sold at a certain price. By selling it $\frac{3}{4}$ of that price, one losses 10%. Find the gain percent at the original price.
 (a) 18% (b) 20%
 (c) 14% (d) 16%
21. A watch is sold for Rs.144. If percentage profit is equal to its CP numerically, then what is CP?
 (a) Rs 72 (b) Rs 80
 (c) Rs 90 (d) Rs 100
22. A person bought an article on 40% discount and sold it at 50% more than the marked price. What profit did he get?
 (a) 250 (b) 150 (c) 350 (d) None of these
23. A reduction of 20% in the price of sugar enables a person to buy 2 kg more for Rs. 30. Find the reduced and the original price per kg of sugar.
 (a) Rs. 4 per kg and Rs. $4\frac{1}{4}$ per kg
 (b) Rs. 3 per kg and Rs. $3\frac{3}{4}$ per kg
 (c) Rs. 2 per kg and Rs. $2\frac{1}{2}$ per kg
 (d) None of these
24. A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%?
 (a) 8 (b) 9
 (c) 5 (d) 2
25. By selling 12 toffees for a rupee, a man loses 20%. How many for a rupee should he sell to get a gain of 20%?
 (a) 6 (b) 8
 (c) 10 (d) 9
26. By selling 45 lemons for Rs.40, a man loses 20%. How many should he sell for Rs.24 to gain 20% in the transaction?
 (a) 19 (b) 18
 (c) 24 (d) 22
27. A man bought a number of clips at 3 for a rupee and an equal number at 2 for a rupee. At what price per dozen should he sell them to make a profit of 20%?
 (a) Rs.9 (b) Rs.10
 (c) Rs.6 (d) Rs. 7
28. A man purchased a box full of pencils at the rate of 7 for Rs.9 and sold all of them at the rate of 8 for Rs. 11. In this transaction, he gained Rs. 10. How many pencils did the box contain?
 (a) 111 (b) 112
 (c) 114 (d) 116
29. A fruit seller has 24 kg of apples. He sells a part of these at a gain of 20% and the balance at a loss of 5%. If on the whole he earns a profit of 10%, the amount of apples sold at a loss is:
 (a) 9.8 kg (b) 8 kg
 (c) 9.6 kg (d) 12.4 kg
30. Padma purchased 30 kg of rice at the rate of Rs. 17.50 per kg and another 30 kg rice at a certain rate. He mixed the two and sold the entire quantity at the rate of Rs.18.60 per kg and made 20% overall profit. At what price per kg did he purchase the lot of another 30 kg rice?
 (a) Rs.14.50 (b) Rs.13.50
 (c) Rs.17.50 (d) Rs.16.50
31. A dairyman pays Rs 6.40 per liter of milk. He adds water and sells the mixture at Rs 8 per liter, thereby making 37.5% profit. The proportion of water to milk received by the customers is:
 (a) 1 : 10 (b) 1 : 12
 (c) 2 : 7 (d) 3 : 20
32. A trader mixes 26 kg of rice at Rs.20 per kg with 30 kg of rice of other variety at Rs.36 per kg and sells the mixture at Rs. 30 per kg. His profit percent is:
 (a) 6% (b) 5%
 (c) 11% (d) 10%
33. Albert buys 4 horses and 9 cows for Rs.13,400. If he sells the horses at 10% profit and the cows at 20% profit, then he

earns a total profit of Rs .1880. The cost of a horse is:

- (a) Rs. 2200 (b) Rs. 2000
(c) Rs. 2700 (d) Rs. 3200

34. A man purchases two clocks A and B at a total cost of Rs .650. He sells A with 20% profit and B at a loss of 25% and gets the same selling price for both the clocks. What are the purchasing prices of A and B respectively?

- (a) Rs 550, Rs 660 (b) Rs 250, Rs 400
(c) Rs 378, Rs 375 (d) Rs 300, Rs 350

35. On selling a chair at 7% loss and a table at 17% gain, a man gains Rs .296. If he sells the chair at 7% gain and the table at 12%

gain, then he gains Rs .400. The actual price of the table is:

- (a) Rs. 2100 (b) Rs .1900
(c) Rs. 2200 (d) Rs. 2400

36. A shopkeeper offers 2.5% discount on cash purchases. What cash amount would Rohan pay for a cycle, the marked price of which is Rs. 650?

- (a) Rs. 633 (b) Rs. 633.75
(c) Rs. 635 (d) Rs. 750

37. A sold an article to B at a profit of 10% and B sells it to C at a loss of 10% and C paid 2079. How much money was paid by A?

- (a) Rs 2100 (b) Rs 2400
(c) Rs 2160 (d) Rs 2480

ANSWER KEY

1	c	10	b	19	b	28	b	37	a
2	b	11	b	20	b	29	c		
3	b	12	c	21	b	30			
4	a	13	c	22	b	31	a		
5	c	14	b	23	b	32	b		
6	a	15	c	24	c	33	b		
7	a	16	b	25	b	34	b		
8	b	17	b	26	b	35	d		
9	c	18	d	27	c	36	b		

SOLUTIONS

$$1. CP = \frac{100 \times SP}{(100 + \text{gain}\%)} = \frac{100 \times 84}{120} = \text{Rs. } 70$$

$$2. SP = \left(\frac{100 - \text{loss}\%}{100} \right) \times CP = \frac{75}{100} \times 20 = \text{Rs. } 15$$

$$3. \text{Loss} = CP - SP = 400 - 300 = 100$$

$$\text{Loss \%} = \left(\frac{100}{400} \times 100 \right) \% = 25\%$$

$$4. \text{Profit} = SP - CP = 300 - 250 = 50$$

$$\text{Profit} = \left(\frac{50}{250} \times 100 \right) \% = 20\%$$

$$5. \text{Gain\%} = \frac{1000 - 960}{960} \times 100 = \frac{25}{6} = 4 \frac{1}{6} \%$$

$$6. \text{Let SP of 1 chocolate} = \text{Rs. } 1$$

$$\text{SP of 18 chocolates} = \text{Rs. } 18$$

$$\text{Loss} = \text{Rs. } 2$$

$$\therefore CP = SP + \text{Loss} = 18 + 2 = \text{Rs. } 20$$

$$L\% = \frac{2}{20} \times 100\% = 10\%$$

7. SP = Rs. 2250, Loss = 10%
 CP = Rs. $\left(\frac{2250 \times 100}{100 - 10}\right)$ = Rs. 2500
 CP = Rs. 2500, SP = 3000,
 Profit = Rs. (3000 - 2500) = Rs. 500
 Gain % = $\left(\frac{500}{2500} \times 100\right)\%$ = 20%

8. CP of 1 orange = Rs. $\frac{100}{25}$ = Rs. 4
 Gain = 30%
 SP of 1 orange = Rs. $\left[\frac{4 \times (100 + 30)}{100}\right]$
 = Rs. 5.20

9. Let the CP = Rs. x

Then,

$$\left(\frac{110}{100}x\right) - \left(\frac{75}{100}x\right) = 21$$

$$\Rightarrow 35x = 2100$$

$$\Rightarrow x = \text{Rs. } 60$$

10. Let MP = Rs. 100

$$\text{After 5\% discount, SP} = \text{Rs. } \left(\frac{95 \times 100}{100}\right)$$

$$= \text{Rs. } 95$$

After 20% discount,

$$\text{SP} = \text{Rs. } \left(\frac{95 \times 80}{100}\right) = \text{Rs. } 76$$

$$\therefore \text{Total discount } (100 - 76)\% = 24\%$$

11. By short cut method.

Let the error be x g.

$$\text{Then, } \frac{x}{1000 - x} \times 100 = 25$$

$$\Rightarrow 4x = 1000 - x$$

$$\Rightarrow 5x = 1000$$

$$\Rightarrow x = 200g$$

$$\therefore \text{Weight used} = (1000 - 200) \text{ g} = 800 \text{ g}$$

12. SP of first book = Rs. 24, Gain = 20%

$$\text{CP of first book} = \text{Rs. } \left(\frac{100}{120} \times 24\right)$$

$$= \text{Rs. } 20$$

$$\text{SP of second book} = \text{Rs. } 24,$$

$$\text{Loss} = 20\%$$

$$\text{CP of second book} = \text{Rs. } \left(\frac{100}{80} \times 24\right)$$

$$= \text{Rs. } 30$$

$$\text{Total CP} = \text{Rs. } (20 + 30) = \text{Rs. } 50$$

$$\text{Total SP} = (24 \times 2) = \text{Rs. } 48$$

$$\text{Loss} = \text{Rs. } (50 - 48) = \text{Rs. } 2$$

13. Let the MP of a scooter = Rs. x

$$\therefore \text{CP of a scooter} = \text{Rs. } \frac{11x}{13}, \text{ gain} = 10\%$$

$$\text{SP} = \text{Rs. } \left(\frac{110}{100} \times x\right) = \text{Rs. } \frac{11x}{10}$$

$$\text{Gain} = \text{SP} - \text{CP} = \text{Rs. } \left(\frac{11x}{10} - \frac{11x}{13}\right)$$

$$= \left(\frac{142x - 110x}{130}\right) = \text{Rs. } \frac{33x}{130}$$

$$\text{Gain \%} = \left(\frac{33x}{130} \times \frac{13}{11x} \times 100\right)\%$$

$$= 30\%$$

14. Let the marked price be Rs. x .

$$CP = 80\% \text{ of Rs. } x = \text{Rs. } \left(\frac{80}{100} \times x\right) = \text{Rs. } \frac{4x}{5}$$

$$SP = 110\% \text{ of } \frac{4x}{5} \text{ Rs.} = \text{Rs. } \left(\frac{110}{100} \times \frac{4x}{5}\right) \\ = \text{Rs. } \frac{22x}{25}$$

$$\therefore \frac{22x}{25} = 825 \Rightarrow x = \left(\frac{825 \times 25}{22}\right) = 937.50$$

$$\therefore MP = \text{Rs. } 937.50$$

15. Let the cost price of 20 mangoes be Rs. x

$$\text{The cost price of 1 mango} = \text{Rs. } \frac{x}{20}$$

$$SP \text{ of 1 mango} = \text{Rs. } \frac{x}{16}$$

$$\text{Gain} = SP - CP = \text{Rs. } \left(\frac{x}{16} - \frac{x}{20}\right) = \text{Rs. } \frac{x}{80}$$

$$\text{Gain} = \left[\frac{\frac{x}{80}}{\frac{x}{20}} \times 100\right] \%$$

$$= \left(\frac{x}{80} \times \frac{20}{x} \times 100\right) \% = 25\%$$

16. $SP = \text{Rs. } b$ and Profit = $a\%$

$$b = \left(\frac{100 + a}{100}\right) \times CP$$

$$\Rightarrow CP = \text{Rs. } \left(\frac{100b}{100+a}\right)$$

17. Let the CP be Rs. 100 and MP be Rs. x above Rs. 100.

Then, $MP = \text{Rs. } (100 + x)$ and discount = 10%

$$\therefore SP = \text{Rs. } \left[\frac{90}{100} \times (100 + x)\right] = \text{Rs. } 117 \\ \Rightarrow x = 30$$

\therefore Cost should be labelled at 30% above CP.

18. Let SP of each article = Rs. 100

On first 25% profit on second 20% loss

$$CP \text{ of first} = \text{Rs. } \left(\frac{100 \times 100}{125}\right) = \text{Rs. } 80$$

$$CP \text{ of second} = \text{Rs. } \left(\frac{100 \times 100}{80}\right) = \text{Rs. } 125$$

$$\text{Total CP} = \text{Rs. } (80 + 125) = \text{Rs. } 205$$

$$\text{Total SP} = \text{Rs. } 200;$$

$$\text{Loss on the whole} = \text{Rs. } (205 - 200) \\ = \text{Rs. } 5$$

$$\text{Loss}\% = \left(\frac{5}{205} \times 100\right) \% = 2\frac{18}{41} \%$$

19. Let CP of 1 m cloth be Rs. 100

$$SP \text{ of 84 cm cloth} = \text{Rs. } 92$$

$$CP \text{ of 84 cm cloth} = \text{Rs. } 84$$

$$\text{Gain} - (SP - CP) = \text{Rs. } (92 - 84) = 8$$

$$\text{Gain}\% = \left(\frac{8}{84} \times 100\right) = 9\frac{11}{21} \%$$

20. Let the CP be Rs. 100.

$$SP \text{ at 10\% loss} = \text{Rs. } 90$$

$$\frac{3}{4} \text{ of actual SP} = \text{Rs. } 90$$

$$\Rightarrow \text{Actual SP} = \text{Rs. } \left(90 \times \frac{4}{3}\right) = \text{Rs. } 120$$

$$\therefore \text{Gain} = 20\%$$

21. **M-I:** Let CP = x

Then, profit = $x\%$

$$\therefore \text{SP} = \text{Rs. } \frac{(100+x) \times x}{100}$$

$$\begin{aligned}\therefore \frac{(100+x)x}{100} &= 144 \\ \Rightarrow x^2 + 100x - 14400 &= 0 \\ \Rightarrow (x-80)(x+180) &= 0 \\ \Rightarrow x &= 80 (\because x \neq 180)\end{aligned}$$

\therefore CP of watch = Rs. 80

M-I:OTP

22. Let the marked price be Rs. 100. Then cost price = $100 - 40 = \text{Rs. } 60$

Selling price = $100 + 50 = \text{Rs. } 150$

Profit = $150 - 60 = 90$

$$\Rightarrow \text{Profit}\% = \frac{90}{60} \times 100 = 150\%$$

23. The reduced price of sugar = $\frac{30 \times 20}{100 \times 2} = \text{Rs. } 3$ per kg and

The original price of sugar

$$= \frac{30 \times 20}{(100 - 20)2} = \frac{15}{4} = \text{Rs. } 3\frac{3}{4} \text{ per kg}$$

24. C.P. of 6 toffees = Re. 1

S.P. of 6 toffees = 120% of Rs. 1

$$= \text{Rs. } \frac{6}{5}$$

For Rs. $\left(\frac{6}{5}\right)$, toffees sold = 6.

For Rs. 1, toffees sold

$$= \left(6 \times \frac{5}{6}\right) = 5$$

25. Let S.P. of 12 toffees be Rs. x .

Then, $80 : 1 = 120 : x$ or

$$x = \left(\frac{120}{80}\right) = \frac{3}{2}$$

For Rs. $\frac{3}{2}$, toffees sold = 12.

For Rs. 1, toffees sold = $\left(12 \times \frac{2}{3}\right) = 8$.

26. Let S.P. of 45 lemons be Rs. x .

Then, $80 : 40 = 120 : x$

$$\text{or } x = \left(\frac{120 \times 40}{80}\right) = 60$$

For Rs. 60, lemons sold = 45. For Rs. 24, lemons sold = $\left(\frac{45}{60} \times 24\right) = 18$.

27. Suppose he bought 1 dozen clips of each kind.

C.P. of 2 dozens

$$= \text{Rs. } \left(\frac{1}{3} \times 12 + \frac{1}{2} \times 12\right) = \text{Rs. } 10$$

S.P. of 2 dozen = 120% of Rs. 10

$$= \text{Rs. } \left(\frac{120}{100} \times 10\right) = \text{Rs. } 12$$

Hence, S.P. per dozen = Rs. 6.

28. Suppose, number of pencils bought = L.C.M. of 7 and 8 = 56.

$$\text{C.P. of 56 pencils} = \text{Rs. } \left(\frac{9}{7} \times 56\right)$$

$$= \text{Rs. } 72.$$

$$\text{S.P. of 56 pencils} = \text{Rs. } \left(\frac{11}{8} \times 56\right) = \text{Rs. } 77.$$

Now, Rs. 5 are gained on 56 pencils.

So, Rs. 10 are gained on, $\left(\frac{56}{5} \times 10\right)$

= 112 pencils.

29. Let the quantity sold at a loss be x kg and let C.P per kg be Re. 1

Total C.P = Rs. 24

Total S.P =

Rs. $[120\% \text{ of } (24 - x) + 95\% \text{ of } x]$

= Rs. $\left[\frac{6}{5}(24 - x) + \frac{19x}{20}\right]$ = Rs. $\left(\frac{576 - 5x}{20}\right)$

$$\therefore \frac{576 - 5x}{20} = \frac{264}{10} \Leftrightarrow 576 - 5x = 528$$

$$\Leftrightarrow 5x = 48 \Leftrightarrow x = 9.6 \text{ kg}$$

30. Let the required price per kg be Rs. x . Then, C.P. of 60 kg rice = Rs. $(30 \times 17.50 + 30 \times x)$
= Rs. $(525 + 30x)$

S.P. of 60 kg rice = Rs. (60×18.60)

= Rs. 1116

$$\therefore \frac{1116 - (525 + 30x)}{525 + 30x} \times 100 = 20$$

$$\Rightarrow \frac{519 - 30x}{525 + 30x} = \frac{1}{5}$$

$$\Leftrightarrow 2955 - 150x = 525 + 30x$$

$$\Leftrightarrow 180x = 2430$$

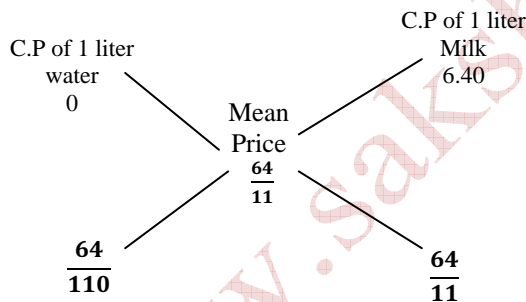
$$\Leftrightarrow x = \left(\frac{2430}{180}\right) = \left(\frac{27}{2}\right) = 13.50$$

So, the C.P of second lot is Rs. 13.50 per kg

31. Mean cost price = Rs. $\left(\frac{100}{137.5} \times 8\right)$

= Rs. $\frac{64}{11}$

By the rule of allegation:



$$\therefore \text{Required ratio} = \frac{64}{110} : \frac{64}{11} = 1 : 10$$

32. C.P. of 56 kg rice

= Rs. $(26 \times 20 + 30 \times 36)$

= Rs. $(520 + 1080)$

= Rs. 1600.

S.P. of 56 kg rice

= Rs. (56×30) = Rs. 1680.

$$\therefore \text{Gain} = \left(\frac{80}{1600} \times 100\right)\% = 5\%$$

33. Let C.P. of each horse be Rs. x and C.P of each cow be Rs. y . Then,

$$4x + 9y = 13400 \dots\dots\dots (i)$$

And, 10% of $4x$ + 20% of $9y$

$$= 1880$$

$$\Rightarrow \frac{2}{5}x + \frac{9}{5}y = 1880$$

$$\Rightarrow 2x + 9y = 9400 \dots \dots (ii)$$

Solving (i) and (ii), we get :

$$x = 2000$$

\therefore Cost price of each horse = Rs. 2000.

34. Let C.P. of clock A be Rs. x and that of clock B be Rs. $(650 - x)$. Then,

$$120\% \text{ of } x = 75\% \text{ of } (650 - x)$$

$$\Rightarrow 650 - x = \frac{120}{75}x = \frac{8}{5}x$$

$$\Rightarrow \frac{13}{5}x = 650 \Rightarrow x = \left(\frac{650 \times 5}{13} \right)$$

$$= 250.$$

\therefore C.P. of A = Rs. 250,

C.P. of B = Rs. 400.

35. Let C.P. of the chair be Rs. x and that of the table be Rs. y .

$$\text{Then, } 17\% \text{ of } y - 7\% \text{ of } x = 296$$

$$\Rightarrow 17y - 7x = 29600 \dots \dots (i)$$

And, $12\% \text{ of } y + 7\% \text{ of } x = 400$

$$\Rightarrow 12y + 7x = 40000 \dots \dots (ii).$$

Solving (i) and (ii), we get :

$$y = 2400$$

C.P. of table = Rs. 2400.

36. S.P = $97\frac{1}{2}\%$ of Rs. 650

$$= \text{Rs. } \left(\frac{195}{2} \times \frac{1}{100} \times 650 \right) = \text{Rs. } 633.75$$

37. Amount paid by B = Rs. 110

$$\text{Amount paid by C} = \text{Rs. } \frac{110 \times 90}{100} = \text{Rs. } 99$$

Then, if C paid Rs. 99 then, A paid Rs. 100.

If C paid Rs. 2079, then A paid

$$= \text{Rs. } \left(\frac{2079}{99} \times 100 \right) = \text{Rs. } 2100$$