CHAPTER 6

Profit and Loss

INTRODUCTION

Cost Price

The amount paid to purchase an article or the price at which an article is made, is known as its cost price.

The cost price is abbreviated as C.P.

Selling Price

The price at which an article is sold, is known as its selling price.

The selling price is abbreviated as S.P.

Profit

If the selling price (S.P.) of an article is greater than the cost price (C.P.), then the difference between the selling price and cost price is called profit.

Thus, If S.P. > C.P., then

Profit = S.P. – C.P.

$\Rightarrow$ S.P. = C.P. + Profit

$\Rightarrow$ C.P. = S.P. – Profit.

Loss

If the selling price (S.P.) of an article is less than the cost price (C.P.), then the difference between the cost price (C.P.) and the selling price (S.P.) is called loss.

Thus, if S.P. < C.P., then

Loss = C.P. – S.P.

$\Rightarrow$ C.P. = S.P. + Loss

$\Rightarrow$ S.P. = C.P. – Loss

EXAMPLE 1. An article was bought for ₹ 2000 and sold for ₹ 2200. Find the gain or loss.

Sol. C.P. of the article = ₹ 2000

S.P. of the article = ₹ 2200

Since S.P. > C.P. So there is gain.

Gain (profit) = S.P. – C.P.

= ₹ 2200 – ₹ 2000 = ₹ 200

Profit and Loss percentage

The profit per cent is the profit that would be obtained for a C.P. of ₹ 100.

Similarly, the loss per cent is the loss that would be made for a C.P. of ₹ 100.

$$\text{Profit per cent} = \frac{\text{Profit}}{\text{C.P.}} \times 100$$

$$\text{Loss per cent} = \frac{\text{Loss}}{\text{C.P.}} \times 100$$

REMEMBER

★ $\text{Profit} = \frac{\text{C.P.} \times \text{Profit \%}}{100}$

★ $\text{Loss} = \frac{\text{C.P.} \times \text{Loss \%}}{100}$

★ $\text{S.P.} = \left(\frac{100 + \text{Profit\%}}{100}\right) \times \text{C.P.}$

★ $\text{S.P.} = \left(\frac{100 - \text{Loss\%}}{100}\right) \times \text{C.P.}$

★ $\text{C.P.} = \frac{100 \times \text{S.P.}}{100 + \text{Profit \%}}$

★ $\text{C.P.} = \frac{100 \times \text{S.P.}}{100 - \text{Loss \%}}$

NOTE

(i) If an article is sold at a certain gain (say 45%), then SP = 145% of CP

(ii) If an article is sold at certain loss (say 25%), then SP = 75% of CP.

EXAMPLE 2. A cycle was purchased for ₹ 1600 and sold for ₹ 1400. Find the loss and loss %.

Sol. C.P. of the cycle = ₹ 1600

S.P. of the cycle = ₹ 1400

Since S.P < C.P, so there is a loss.

Loss = C.P. – S.P.

= ₹ 1600 – ₹ 1400 = ₹ 200.

$$\text{Loss \%} = \frac{\text{Loss}}{\text{C.P.}} \times 100 = \frac{200}{1600} \times 100 = 12\frac{1}{2}\%$$

EXAMPLE 3. By selling a table for ₹ 330, a trader gains 10%. Find the cost price of the table.

Sol. S.P. = ₹ 330, Gain = 10%

$$\therefore \quad \text{C.P.} = \left(\frac{100}{100+\text{Gain }\%}\right)\times \text{S.P}.$$

$$= ₹\ \frac{100}{100+10}\times 330 = \frac{100}{110}\times 330 = ₹\ 300.$$

EXAMPLE 4. A sells a bicycle to B at a profit of 20% and B sells it to C at a profit of 25%. If C pays ₹ 225 for it, what did A pay for it.

Sol. $\text{C.P. of A} = 225\times\frac{100}{100+20}\times\frac{100}{100+25}$

$$= 225\times\frac{100}{120}\times\frac{100}{125} = ₹\ 150.$$

EXAMPLE 5. A mobile phone is sold for ₹ 5060 at a gain of 10%. What would have been the gain or loss per cent if it had been sold for ₹ 4370 ?

Sol. S.P. = ₹ 5060, gain = 10%

$$\therefore \text{C.P.} = \frac{5060\times 100}{100+10} = ₹\ 4600.$$

2nd S.P. = ₹ 4370

Since, S.P. < C.P., so there is loss.

$$\therefore \text{Loss }\% = \frac{(4600-4370)\times 100}{4600} = 5\%$$

☞ Shortcut Approach

Dishonest dealing

$$\text{Gain }\% = \frac{\text{Error}}{\text{True value} - \text{Error}}\times 100$$

$$\frac{\text{True Scale}}{\text{False Scale}} = \frac{100+\text{gain}\%}{100-\text{loss}\%}$$

EXAMPLE 6. A cloth merchant says that due to slump in the market, he sells the cloth at 10% loss, but he uses a false metre-scale and actually gain 15%. Find the actual length of the scale.

(a) 78 cm **(b) 78.25 cm**
(c) 78.5 cm **(d) 78.75 cm**

Sol. (b) $\frac{\text{True scale}}{\text{False scale}} = \frac{100+\text{gain}\%}{100-\text{loss}\%}$

$$\frac{100}{\text{False scale}} = \frac{100+15}{100-10}$$

$$\Rightarrow \text{False scale} = \frac{100\times 90}{115} = 78.26\,\text{cm}$$

☞ Shortcut Approach

Real Profit/Loss percentage :

If the profit or loss is calculated on S.P., then it is not actual profit or loss.

Real profit (loss)% is the profit (loss)% on C.P.

$$\text{Real Profit }\% = \frac{\%\text{ profit on S.P.}}{100-\%\text{ profit on S.P.}}\times 100$$

EXAMPLE 7. A dishonest dealer professes to sell his goods at cost price, but he uses a weight of 960 g for the kg weight. Find his gain per cent.

Sol. Error = 1 kg – 960 g

= 1000 g – 960 g = 40 g.

$$\therefore \quad \text{Gain }\% = \frac{40}{1000-40}\times 100$$

$$= \frac{40}{960}\times 100 = 4\frac{1}{6}\%$$

☞ Shortcut Approach

Goods passing through successive hands

When there are two successive profits of a% and b%, then the resultant profit per cent is given by

$$\left(a+b+\frac{ab}{100}\right)\%$$

When there are two successive loss a% and b%, then the resultant loss per cent is given by $\left(-a-b+\frac{ab}{100}\right)\%$

When there is a profit of a% and loss by b% in a transaction, then the resultant profit or loss per cent is given by $\left(a-b-\frac{ab}{100}\right)\%$, according to the +ve or –ve sign respectively.

When cost price and selling price are reduced by the same amount (A) and profit increases then cost price (C.P.)

$$= \frac{[\text{Initial profit }\% + \text{Increase in profit }\%]\times A}{\text{Increase in profit }\%}$$

EXAMPLE 8. A table is sold at a profit of 20%. If the cost price and selling price are ₹ 200 less, the profit would be 8% more. Find the cost price.

Sol. $\text{C.P.} = ₹\frac{(20+8)\times 200}{8} = ₹\ 28\times 25 = ₹\ 700.$

Shortcut Approach

If cost price of x articles is equal to the selling price of y articles, then profit/loss percentage $= \frac{x-y}{y}\times 100\%$, according to +ve or –ve sign respectively.

EXAMPLE 9. If the C.P. of 15 tables be equal to the S.P. of 20 tables, find the loss per cent.

Sol. Profit/Loss% $= \frac{-5}{20}\times 100 = 25\%$ loss, since it is –ve.

EXAMPLE 10. If the cost price of 20 articles is equal to the selling price of 18 articles, then find the profit per cent.

Sol. Here, x = 20 and y = 18

According to the formula,

$$\text{Profit}\% = \left(\frac{x-y}{y}\times 100\right)\% = \left(\frac{20-18}{18}\times 100\right)\%$$

$$= \frac{100}{9}\% = 11\frac{1}{9}\%$$

EXAMPLE 11. If the C.P. of 6 articles is equal to the S.P. of 4 articles. Find the gain per cent.

Sol. Let C.P. of an article be ₹ x; then,

C.P. of 6 articles = ₹ 6x

C.P. of 4 articles = ₹ 4x

But S.P. of 4 articles = C.P. of 6 articles

$\therefore$ S.P. of 4 articles = 6x

Thus, gain = S.P – C.P. = ₹ (6x – 4x) = ₹ 2x

$$\therefore \quad \text{Gain}\% = \frac{2x}{4x}\times 100 = 50$$

Thus, gain in the transaction = 50%

EXAMPLE 12. By selling 33 metres of cloth, a man gains the sale price of 11 metres. The gain % is

(a) 50% **(b) 25%**

(c) $33\frac{1}{3}$ % **(d) 20%**

Sol. (a) Gain = S.P. of 33 metres – C.P. of 33 metres

= S.P. of 11 metres

$\Rightarrow$ S.P. of 22 metres = C.P. of 33 metres

$$\therefore \%\ \text{gain} = \frac{\text{gain}}{\text{C.P. of metres}}\times 100$$

$$= \frac{\text{S.P. of 11 metres}}{\text{C.P. of 33 metres}}\times 100$$

$$= \frac{\text{S.P. of 11 metres}}{\text{S.P. of 22 metres}}\times 100 = \frac{11}{22}\times 100 = 50\%$$

SHORTCUT METHOD

If on selling 'x' articles a man gains equal to the S.P. of y articles. Then,

$$\%\ \text{gain} = \frac{y}{x-y}\times 100 = \frac{11}{33-11}\times 100 = \frac{11}{22}\times 100 = 50\%$$

Shortcut Approach

A man purchases a certain number of articles at x a rupee and the same number at y a rupee. He mixes them together and sells them at z a rupee. Then his gain or loss %

$$= \left[\frac{2xy}{z(x+y)} - 1\right]\times 100$$ according as the sign is +ve or –ve.

If two items are sold, each at ₹. x, one at a gain of p% and the other at a loss of p%, there is an overall loss given by $\frac{p^2}{100}\%$. The absolute value of the loss is given by

$$\frac{2p^2x}{100^2 - p^2}.$$

If CP of two items is the same and % Loss and % Gain on the two items are equal, then net loss or net profit is zero.

EXAMPLE 13. A shopkeeper sold two radio sets for ₹ 792 each, gaining 10% on one, and losing 10% on the other. Then he

(a) neither gains nor loses **(b) gains 1%**

(c) loses 1% **(d) gains 5%**

Sol. (c) When selling price of two articles is same and

% gain = % loss

then there will be always loss.

$$\text{and overall \% loss} = \frac{(10)^2}{100}\% = 1\%$$

EXAMPLE 14. A man bought two housing apartments for ₹ 2 lakhs each. He sold one at 20% loss and the other at 20% gain. Find his gain or loss.

(a) 4% loss **(b) 4 % gain**

(c) No loss, no gain **(d) 10 % loss**

Sol. (c) When C.P. of two articles is same and

% gain = % loss

Then, on net, there is no loss, no gain

when two different articles sold at same S.P. and x_1 and x_2 are % gain (or loss) on them. Then, overall % gain or loss

$$= \left[\frac{100 - 2(100 \pm x_1)(100 \pm x_2)}{(100 \pm x_1) + (100 \pm x_2)}\right]\%$$

(Taking + or – according to gain or loss)

EXAMPLE 15. A man sold two watches for ₹ 1000 each. On one he gains 25% and on the other 20% loss. Find how much % does he gain or lose in the whole transaction?

(a) $\frac{100}{41}$**% loss** **(b)** $\frac{100}{41}$**% gain**

(c) No gain, no loss **(d) Cannot be determined**

Sol. (b) When $S_1 = S_2$, then

overall % gain or % loss

$$= \left[100 - \frac{2(100 + x_1)(100 - x_2)}{(100 + x_1) + (100 - x_2)}\right]\%$$

$$= \left(100 - \frac{2(125)(80)}{(125) + (80)}\right)\% = \left(100 - \frac{2 \times 125 \times 80}{205}\right)\%$$

$$= \frac{100}{41}\% \text{ gain } (\because \text{ it is +ve})$$

Shortcut Approach

A businessman sells his items at a profit/loss of a%. If he had sold it for ₹ R more, he would have gained/lost b%. Then,

CP of items $= \frac{R}{b \pm a} \times 100$

'–' = When both are either profit or loss

'+' = When one is profit and other is loss

EXAMPLE 16. A person sold a table at a profit of $6\frac{1}{2}$%. If he had sold it for ₹ 1250 more, he would have gained 19%. Find the CP of the table.

Sol. Here, $a = 6\frac{1}{2}\% = \frac{13}{2}\%$

$b = 19\%$ and $R = ₹ 1250$

According to the formula,

$$\text{CP of table} = \frac{R}{b - a} \times 100$$

$$= \frac{1250}{19 - \frac{13}{2}} \times 100 = \frac{1250 \times 2}{25} \times 100$$

$$= ₹ 10000$$

Shortcut Approach

If A sold an article to B at a profit (loss) of r_1 % and B sold this article to C at a profit (loss) of r_2 %, then cost price of article for C is given by (cost price for A) $\times \left(1 \pm \frac{r_1}{100}\right)\left(1 \pm \frac{r_2}{100}\right)$.

EXAMPLE 17. Nikunj sold a machine to Sonia at a profit of 30%. Sonia sold this machine to Anu at a loss of 20%. If Nikunj paid ₹ 5000 for this machine, then find the cost price of machine for Anu.

Sol. Here $r_1 = 30\%$ and $r_2 = 20\%$

CP of a machine for Nikunj = ₹ 5000

$\therefore$ CP of machine for Anu = CP of machine for Nikunj

$$\left(1 + \frac{r_1}{100}\right)\left(1 - \frac{r_2}{100}\right)$$

$$= 5000\left(1 + \frac{30}{100}\right)\left(1 - \frac{20}{100}\right) = 5000 \times \frac{130}{100} \times \frac{80}{100} = ₹ 5200$$

Shortcut Approach

If a man purchases m items for ₹ x and sells n items for ₹ y, then

Profit or loss per cent is given by $\frac{my - nx}{nx} \times 100\%$

[Positive result means profit and negative result means loss].

EXAMPLE 18. If Karan purchases 10 or anges for ₹ 25 and sells 9 oranges for ₹ 25, then find the gain percentage.

Sol. Here, $m = 10$, $x = 25$, $n = 9$ and $y = 25$

$$\therefore \text{ Profit per cent} = \frac{my - nx}{nx} \times 100\%$$

$$= \frac{25 \times 10 - 9 \times 25}{9 \times 25} \times 100\%$$

$$= \frac{250 - 225}{225} \times 100\%$$

$$= \frac{25}{255} \times 100\% = \frac{100}{9}\% = 11\frac{1}{9}\%$$

Marked Price

The price on the lable is called the marked price or list price.

The marked price is abbreviated as M.P.

Discount

The reduction made on the 'marked price' of an article is called the discount.

NOTE : *When no discount is given, 'selling price' is the same as 'marked price'.*

- Discount = Marked price × Rate of discount.
- S.P. = M.P. – Discount.
- Discount % = $\frac{\text{Discount}}{\text{M.P.}} \times 100$.
- Buy x get y free i.e., if x + y articles are sold at cost price of x articles, then the percentage discount = $\frac{y}{x+y} \times 100$.

EXAMPLE 19. How much % must be added to the cost price of goods so that a profit of 20% must be made after throwing off a discount of 10% from the marked price?

(a) 20% **(b) 30%**

(c) $33\frac{1}{3}$ % **(d) 25%**

Sol. (c) Let C.P. = ₹ 100, then S.P. = ₹ 120

Also, Let marked price be ₹ x. Then

90% of x = 120

$\Rightarrow x = \frac{120 \times 100}{90} = 133\frac{1}{3}$

$\therefore$ M.P. should be ₹ $133\frac{1}{3}$

or M.P. = $33\frac{1}{3}$% above C.P.

EXAMPLE 20. At a clearance sale, all goods are on sale at 45% discount. If I buy a skirt marked ₹ 600, how much would I need to pay?

Sol. M.P. = ₹ 600, Discount = 45%

$\text{Discount} = \frac{\text{M.P.} \times \text{Discount}\%}{100} = \frac{600 \times 45}{100} = ₹ 270.$

$\therefore$ S.P. = M.P. – Discount

= ₹ 600 – ₹ 270 = ₹ 330.

Hence, the amount I need to pay is ₹ 330.

EXAMPLE 21. After allowing a discount of 12% on the marked price of an article, it is sold for ₹ 880. Find its marked price.

Sol. S.P. = ₹ 880 and Discount % = 12

Let M.P. = x

$\text{Discount} = \frac{\text{M.P.} \times \text{Discount}\%}{100} = \frac{x \times 12}{100} = \frac{3}{25}x$

Now, M.P. = S.P. + Discount

$x = 880 + \frac{3}{25}x$

$\Rightarrow x - \frac{3}{25}x = 880 \Rightarrow \frac{22x}{25} = 880$

$\Rightarrow x = \frac{880 \times 25}{22} = 40 \times 25 = ₹ 1000$

$\therefore$ Marked price of the article is ₹ 1000.

EXAMPLE 22. A shopkeeper offers his customers 10% discount and still makes a profit of 26%. What is the actual cost to him of an article marked ₹ 280?

Sol. M.P. = ₹ 280 and Discount % = 10

$\text{Discount} = \frac{\text{M.P.} \times \text{Discount}\%}{100} = \frac{280 \times 10}{100} = ₹ 28$

S.P. = M.P. – Discount = ₹ 280 – ₹ 28 = ₹. 252

Now, S.P. = ₹. 252 and profit = 26%

$\therefore$ $\text{C.P.} = \frac{100}{100 + \text{gain}\%} \times \text{S.P.}$

$= \frac{100}{100+26} \times 252 = ₹ 200$

Hence, the actual cost of the article is ₹ 200.

REMEMBER

★ In **successive discounts**, first discount is subtracted from the marked price to get net price after the first discount. Taking this price as the new marked price, the second discount is calculated and it is subtracted from it to get net price after the second discount. Continuing in this manner, we finally obtain the final selling price.

In case of successive discounts a% and b%, the effective discount is $\left(a + b - \frac{ab}{100}\right)\%$

EXAMPLE 23. Find the single discount equivalent to successive discounts of 15% and 20%.

Sol. By direct formula,

$\text{Single discount} = \left(a + b - \frac{ab}{100}\right)\%$

$= \left(15 + 20 - \frac{15 \times 20}{100}\right)\% = 32\%$

NOTE : *If the list price of an item is given and discounts d_1 and d_2 are given succesively on it then,*

$$\textit{Final price} = \textit{list price}\left(1 - \frac{d_1}{100}\right)\left(1 - \frac{d_2}{100}\right)$$

EXAMPLE 24. An article is listed at ₹ 65. A customer bought this article for ₹ 56.16 and got two successive discounts of which the first one is 10%. The other rate of discount of this scheme that was allowed by the shopkeeper was :

(a) 3% **(b) 4%**

(c) 6% **(d) 2%**

Sol. (b) Price of the article after first discount

$65 - 6.5 = ₹ 58.5$

Therefore, the second discount

$$= \frac{58.5 - 56.16}{58.5} \times 100 = 4\%$$

EXAMPLE 25. A shopkeeper offers 5% discount on all his goods to all his customers. He offers a further discount of 2% on the reduced price to those customers who pay cash. What will you actually have to pay for an article in cash if its M.P. is ₹ 4800?

Sol. M.P. = ₹ 4800

First discount = 5% of M.P.

$$= \frac{5}{100} \times 4800 = ₹ 240$$

Net price after discount = ₹ 4800 – ₹ 240

= ₹ 4560

Second discount = 2% of ₹ 4560

$$= \frac{2}{100} \times 4560 = ₹ 91.20$$

Net price after discount = ₹ 4560 – ₹ 91.20

= ₹ 4468.80

SHORTCUT METHOD

$$\text{S.P.} = 4800\left(1 - \frac{5}{100}\right)\left(1 - \frac{2}{100}\right) = ₹\ 4468.80$$

SALES TAX

To meet government's expenditures like construction of roads, railway, hospitals, schools etc. the government imposes different types of taxes. Sales tax (S.T.) is one of these tax.
Sales tax is calculated on selling price (S.P.)

NOTE : *If discount is given, selling price is calculated first and then sales tax is calculated on the selling price of the article.*

EXAMPLE 26. Sonika bought a V.C.R. at the list price of ₹ 18,500. If the rate of sales tax was 8%, find the amount she had to pay for purchasing the V.C.R.

Sol. List price of V.C.R. = ₹ 18,500

Rate of sales tax = 8%

∴ Sales tax = 8% of ₹ 18,500

$$= \frac{8}{100} \times 18500 = ₹ 1480$$

So, total amount which Sonika had to pay for purchasing the V.C.R. = ₹ 18,500 + ₹ 1480

= ₹ 19,980.

EXAMPLE 27. The sale price of an article including the sales tax is ₹ 616. The rate of sales tax is 10%. If the shopkeeper has made a profit of 12%, then the cost price of the article is :

(a) ₹ 500 **(b) ₹ 515**

(c) ₹ 550 **(d) ₹ 600**

Sol. (a) Let the CP of the article be ₹ x

Then, SP = $x \times 1.12 \times 1.1$

Now, $x \times 1.12 \times 1.1 = 616$

$$\Rightarrow x = \frac{616}{1.232} = ₹ 500$$

☞ Shortcut Approach

If 'a'th part of some items is sold at x% loss, then required gain per cent in selling rest of the items in order that there is neither gain nor loss in whole transaction, is $\frac{ax}{1-a}\%$

EXAMPLE 28. A medical store owner purchased medicines worth ₹ 6000 from a company. He sold 1/3 part of the medicine at 30% loss. On which gain he should sell his rest of the medicines, so that he has neither gain nor loss?

Sol. Given, $a = \frac{1}{3}$ and $x = 30\%$

According to the formula,

$$\text{Required gain } \% = \frac{ax}{1-a}\% = \frac{\frac{1}{3} \times 30}{1 - \frac{1}{3}}\% = \frac{10 \times 3}{2}\% = 15\%$$

EXERCISE

1. If by selling twelve note-books, the seller earns profit equal to the selling price of two note-books, what is his percentage profit?
(a) 20% (b) 25%
(c) $16\frac{2}{3}\%$ (d) Data inadequate
(e) None of these

2. A grocer purchased 20 kg of rice at the rate of ₹ 15 per kg and 30 kg of rice at the rate of ₹ 13 per kg. At what price per kg should he sell the mixture to earn $33\frac{1}{3}\%$ profit on the cost price?
(a) ₹ 28.00 (b) ₹ 20.00
(c) ₹ 18.40 (d) ₹ 17.40
(e) None of these

3. By selling an article for ₹ 96, double profit is obtained than the profit that would have been obtained by selling it for ₹ 84. What is the cost price of the article?
(a) ₹ 72.00 (b) ₹ 75.00
(c) ₹ 70.00 (d) ₹ 68.00
(e) None of these

4. A shopkeeper sold a TV set for ₹ 17940, at a discount of 8% and gained 19.6%. If no discount is allowed, what will be his gain per cent?
(a) 25% (b) 36.4%
(c) 24.8% (d) Can't be determined
(e) None of these

5. Deepa bought a calculator at 30% discount on the listed price. Had she not got the discount, she would have paid ₹ 82.50 extra. At what price did she buy the calculator ?
(a) ₹ 192.50 (b) ₹ 275
(c) ₹ 117.85 (d) Cannot be determined
(e) None of these

6. A shopkeeper sells a TV set for ₹ 16560 at 10% discount on its marked price and earns 15% profit. If no discount is offered, then what will be his present per cent profit?
(a) $27\frac{7}{9}$ (b) $22\frac{7}{9}$
(c) $25\frac{7}{9}$ (d) Data inadequate
(e) None of these

7. A builder purchased a plot of land for ₹ 80 lakh and constructed a five-storey building inclusive of ground floor on it. How much should he charge for each flat to make 25% profit on his investment on land, if there are five flats on each storey?
(a) ₹ 50000 (b) ₹ 100000
(c) ₹ 500000 (d) ₹ 2000000
(e) None of these

8. A trader purchased on old bicycle for ₹ 480. He spent 20% of the cost on its repair. If he wants to earn ₹ 144 as net profit on it, how much percentage should he add to the purchase price of the bicycle?
(a) 50% (b) 48%
(c) 96% (d) 100%
(e) None of these

9. The price of 2 sarees and 4 shirts is ₹ 16000. With the same money one can buy 1 saree and 6 shirts. If one wants to buy 12 shirts, how much shall one have to pay?
(a) ₹ 2,400 (b) ₹ 4,800
(c) ₹ 1,200 (d) Cannot be determined
(e) None of these

10. A shopkeeper bought 150 calculators at the rate of ₹ 250 per calculator. He spent ₹ 2500 on transportation and packing. If the marked price of calculator is ₹ 320 per calculator and the shopkeeper gives a discount of 5% on the marked price then what will be the percentage profit gained by the shopkeeper?
(a) 20% (b) 14%
(c) 15% (d) 16%
(e) None of these

11. A garment company declared 15% discount for whole sale buyers. Mr Sachdev bought garments from the company for ₹ 25,000 after getting discount. He fixed up the selling price of garments in such a way that he earned a profit of 8% on original company price. What is the **approximate** total selling price?
(a) ₹ 28,000 (b) ₹ 29,000
(c) ₹ 32,000 (d) ₹ 28,500
(e) ₹ 29,500

12. A shopkeeper sold an article for ₹ 720 after giving 10% discount on the labelled price and made 20% profit on the cost price. What would have been the percentage profit, had he not given the discount''?
(a) 25% (b) 30%
(c) 23% (d) 28%
(e) None of these

13. The difference between a discount of 35% and two successive discounts of 20% and 20% on a certain bill was ₹ 22. Find the amount of the bill.
(a) ₹ 1,100 (b) ₹ 200
(c) ₹ 2,200 (d) Data inadequate
(e) None of these

14. A shopkeeper labels the price of articles 20% above the cost price. If he allows ₹ 31.20 off on a bill of ₹ 312, find his profit per cent on the article?
(a) 8 (b) $12\frac{1}{3}$
(c) $11\frac{2}{3}$ (d) $8\frac{1}{3}$
(e) None of these

15. A shopkeeper sold an article offering a discount of 5% and earned a profit of 23.5%. What would have been the percentage of profit earned if no discount had been offered?
(a) 28.5 (b) 27.675
(c) 30 (d) Data inadequate
(e) None of these

16. A shopkeeper sold sarees at ₹ 266 each after giving 5% discount on labelled price. Had he not given the discount, he would have earned a profit of 12% on the cost price. What was the cost price of each saree?
(a) ₹ 280 (b) ₹ 260
(c) ₹ 38 mph (d) Data inadequate
(e) None of these

17. The profit earned by selling an article for ₹ 832 is equal to the loss incurred when the same article is sold for ₹ 448. What should be the sale price of the article for making 50 per cent profit?
(a) ₹ 960 (b) ₹ 1060
(c) ₹ 1,200 (d) ₹ 920
(e) None of these

18. Prabhu purchased 30 kg of rice at the rate of ₹ 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 ₹ 18.60 per kg and made 20 per cent overall profit. At what price per kg did he purchase the lot of another 30 kg rice?
(a) ₹ 14.50 (b) ₹ 12.50
(c) ₹ 15.50 (d) ₹ 13.50
(e) None of these

19. An article when sold for ₹ 200 fetches 25 per cent profit. What would be the percentage profit/loss if 6 such articles are sold for ₹ 1,056?
(a) 10 pre cent loss (b) 10 per cent profit
(c) 5 per cent loss (d) 5 per cent profit
(e) None of these

20. A shopkeeper gave an additional 20 per cent concession on the reduced price after giving 30 per cent standard concession on an article. If Arun bought that article for ₹ 1,120, what was the original price?
(a) ₹ 3,000 (b) ₹ 4,000
(c) ₹ 2,400 (d) ₹ 2,000
(e) None of these

21. What per cent of selling price would be 34% of cost price if gross profit is 26% of the selling price?
(a) 17.16 (b) 74.00
(c) 25.16 (d) 88.40
(e) None of these

22. A man sold 10 eggs for 5 rupees and gained 20%.How many eggs did he buy for 5 rupees?
(a) 10 eggs (b) 12 eggs
(c) 14 eggs (d) 16 eggs
(e) None of these

23. A person sells 36 oranges per rupee and suffers a loss of 4%. Find how many oranges per rupee to be sold to have a gain of 8%?
(a) 30 (b) 31
(c) 32 (d) 33
(e) None of these

24. Coconuts were purchased at ₹ 150 per hundred and sold at ₹ 2 per coconut. If 2000 coconuts were sold, what was the total profit made?
(a) ₹ 500 (b) ₹ 1000
(c) ₹ 1500 (d) ₹ 2000
(e) None of these

25. A shopkeeper's price is 50% above the cost price. If he allows his customer a discount of 30% what profit does he make?
(a) 5% (b) 10%
(c) 15% (d) 20%
(e) None of these

26. A shopkeeper purchases 10 kg of rice at ₹ 600 and sells at a loss as much the selling price of 2 kg of rice . Find the sale rate of rice/ kg.
(a) ₹ 60 per kg (b) ₹ 50 per kg
(c) ₹ 80 per kg (d) ₹ 70 per kg
(e) None of these

27 If 15 oranges are bought for a rupee, how many must be sold for a rupee to gain 25%?
(a) 12 (b) 10
(c) 20 (d) 18
(e) None of these

28. A man buys milk at ₹ 6 per litre and adds one third of water to it and sells mixture at ₹ 7.20 per litre. The gain is
(a) 40% (b) 80%
(c) 60% (d) 25%
(e) None of these

29. A milk man makes a profit of 20% on the sale of milk. If he were to add 10% water to the milk, by what %would his profit increase?
(a) 30 (b) $\frac{40}{3}$
(c) 22 (d) 10
(e) None of these

30. A grocer purchased 80 kg of sugar at ₹ 13.50 per kg and mixed it with 120 kg sugar at ₹ 16 per kg. At what rate should he sell the mixture to gain 16%?
(a) ₹ 17 per kg (b) ₹ 17.40 per kg
(c) ₹ 16.5 per kg (d) ₹ 16 per kg
(e) None of these

31. A dishonest fruit seller professes to sell his goods at the cost price but weighs 800 grams for a kg weight. Find his gain percent.
(a) 100% (b) 150%
(c) 50% (d) 200%
(e) None of these

32. A shopkeeper purchased 150 identical pieces of calculators at the rate of ₹ 250 each. He spent an amount of ₹ 2500 on transport and packing. He fixed the labelled price of each calculator at ₹ 320. However, he decided to give a discount of 5% on the labelled price. What is the percentage profit earned by him ?
(a) 14% (b) 15%
(c) 16% (d) 20%
(e) None of these

33. A dishonest dealer sells his goods at the cost price but still earns a profit of 25% by underweighing. What weight does he use for a kg?
(a) 750 g (b) 800 g
(c) 825 g (d) 850 g
(e) None of these

34. A shopkeeper marks up his goods to gain 35%. But he allows 10% discount for cash payment. His profit on the cash transaction therefore, in percentage, is
(a) $13\frac{1}{2}$ (b) 25
(c) $21\frac{1}{2}$ (d) $31\frac{1}{2}$
(e) None of these

35. A man sold two steel chairs for ₹ 500 each. On one he gains 20% and on other, he loses 12%. How much does he gain or lose in the whole transaction?
(a) 1.5% gain (b) 2% gain
(c) 1.5% loss (d) 2% loss
(e) None of these

36. A firm of readymade garments makes both men's and women's shirts. Its average profit is 6% of the sales. Its profit in men's shirts average 8% of the sales and women's shirts comprise 60% of the output. The average profit per sale rupee in women shirts is
(a) 0.0466 (b) 0.0666
(c) 0.0166 (d) 0.0366
(e) None of these

37. A man purchases two watches at ₹ 560. He sells one at 15% profit and other at 10% loss. Then he neither gains nor lose. Find the cost price of each watch.
(a) ₹ 224, ₹ 300 (b) ₹ 200, ₹ 300
(c) ₹ 224, ₹ 336 (d) ₹ 200, ₹ 336
(e) None of these

38. A man bought a horse and a carriage for ₹ 3000. He sold the horse at a gain of 20% and the carriage at a loss 10%, thereby gaining 2% on the whole. Find the cost of the horse.
(a) ₹ 1000 (b) ₹ 1200
(c) ₹ 1500 (d) ₹ 1700
(e) None of these

39. Two electronic musical instruments were purchased for ₹ 8000. The first was sold at a profit of 40% and the second at loss of 40%. If the sale price was the same in both the cases, what was the cost price of two electronic musical instruments?
(a) ₹ 2000, ₹ 5000 (b) ₹ 2200, ₹ 5500
(c) ₹ 2400, ₹ 5000 (d) ₹ 2400, ₹ 5600
(e) None of these

40. A man sells an article at a gain 15%. If he had bought it at 10% less and sold it for ₹ 4 less, he would have gained 25%. Find the cost price of the article.
(a) ₹ 150 (b) ₹ 160
(c) ₹ 170 (d) ₹ 180
(e) None of these

41. A man sells an article at 5% profit. If he had bought it at 5% less and sold it for ₹ 1 less, he would have gained 10%. The cost price of the article is :
(a) ₹ 200 (b) ₹ 150
(c) ₹ 240 (d) ₹ 280
(e) None of these

42. Five kg of butter was bought by a shopkeeper for ₹ 300. One kg becomes unsaleable. He sells the remaining in such a way that on the whole he incurs a loss of 10%. At what price per kg was the butter sold?
(a) ₹ 67.50 (b) ₹ 52.50
(c) ₹ 60 (d) ₹ 72.50
(e) None of these

43. A fruitseller sells 8 oranges at a cost price of 9. The profit per cent is
(a) $12\frac{1}{2}$ (b) $11\frac{1}{9}$
(c) $5\frac{15}{17}$ (d) $8\frac{2}{3}$
(e) None of these

44. The cost price of 20 articles is equal to the selling price of 25 articles. The loss percent in the transaction is
(a) 5 (b) 20
(c) 25 (d) 30
(e) None of these

45. By selling 66 metres of cloth a person gains the cost price of 22 metres. Find the gain per cent.
(a) 22% (b) $22\frac{1}{2}\%$
(c) 33% (d) $33\frac{1}{3}\%$
(e) None of these

46. By selling 66 metres of cloth a man loses the selling price of 22 metres. Find the loss per cent.
(a) 20% (b) 25%
(c) 30% (d) 35%
(e) None of these

47. A single discount equal to a discount series of 10% and 20% is
(a) 25% (b) 28%
(c) 30% (d) 35%
(e) None of these

48. The list price of a watch is ₹ 160. A retailer bought the same watch ₹ 122.40. He got two successive discounts one at 10% and the other at a rate which was not legible. What is the second discount rate?
(a) 12% (b) 14%
(c) 15% (d) 18%
(e) None of these

49. A tradesman is marketing his goods 20% above the cost price of the goods. He gives 10% discount on cash payment, find his gain percent.
(a) 12% (b) 8%
(c) 15% (d) 18%
(e) None of these

50. For a certain article, if discount is 25%, the profit is 25%. If the discount is 10%, then the profit is
(a) 10% (b) 20%
(c) 35% (d) 50%
(e) None of these

51. A trader marks his goods at such a price that he can deduct 15% for cash and yet make 20% profit. Find the marked price of an item which costs him ₹ 90 :
(a) ₹ $135\frac{11}{13}$ (b) ₹ $105\frac{3}{21}$
(c) ₹ $127\frac{1}{17}$ (d) ₹ $95\frac{1}{21}$
(e) None of these

52. A trader wants 10% profit on the selling price of a product whereas his expenses amount to 15% on sales. What should be his rate of mark up on an article costing ₹ 9?
(a) 20% (b) $66\frac{2}{3}\%$
(c) 30% (d) $\frac{100}{3}\%$
(e) None of these

ANSWER KEY

1	(a)	7	(e)	13	(c)	19	(b)	25	(a)	31	(a)	37	(c)	43	(a)	49	(b)
2	(c)	8	(a)	14	(a)	20	(d)	26	(b)	32	(a)	38	(b)	44	(c)	50	(d)
3	(a)	9	(a)	15	(c)	21	(c)	27	(a)	33	(b)	39	(d)	45	(d)	51	(c)
4	(e)	10	(b)	16	(e)	22	(b)	28	(b)	34	(c)	40	(b)	46	(b)	52	(d)
5	(a)	11	(c)	17	(a)	23	(c)	29	(b)	35	(a)	41	(a)	47	(b)		
6	(a)	12	(e)	18	(d)	24	(b)	30	(b)	36	(a)	42	(a)	48	(c)		

Hints & Explanations

1. (a) Percentage profit $= \frac{2}{12-2} \times 100 = 20\%$

2. (c) $CP = 20 \times 15 + 30 \times 13 = ₹690$

$\therefore \quad SP = \frac{4}{3}$ of $690 \times \frac{1}{50} = ₹18.40$

3. (a) Let the cost price of the article be ₹ x.
Then, $2(84 - x) = 96 - x$
$168 - 2x = 96 - x \qquad \therefore x = ₹72$

4. (e) If no discount is given, selling price of TV

$= 17940 \times \frac{100}{92} = ₹19500$

Cost price of TV $= 17940 \times \frac{100}{119.60} = ₹15000$

Gain % $= \frac{19500 - 15000}{15000} \times 100 = 30\%$

5. (a) List price of calculator

$= \frac{82.50}{30} \times 100 = ₹275$

Deepa bought calculator in
275×0.70 ₹ 192.50

6. (a) Original selling price of TV set

$= ₹ \frac{16560 \times 100}{90} = ₹18400$

Cost price of the TV $= \frac{16560 \times 100}{115} = ₹14400$

at no discount, % profit will be

$= \frac{(18400 - 14400) \times 100}{14400} = 27\frac{7}{9}\%$

7. (e) We do not know the total investment of builder, because in the question construction cost is not given. Hence, 'None of these' is the answer.

8. (a) Purchase price = ₹ 480
Repair cost = 20% of ₹ 480 = ₹ 96
$\therefore$ Total cost = ₹ 480 + ₹ 96 = ₹ 576
Net profit = ₹ 144
$\therefore$ Selling price = Total cost + Net profit
= ₹ 576 + 144 = ₹ 720
Now, Selling price - Purchase price
= ₹ 720 – ₹ 480 = ₹ 240

$\therefore$ Reqd percentage $= \frac{₹240}{₹480} \times 100 = 50\%$

9. (a) Let the price of one saree and one shirt be ₹ x and ₹ y respectively.
Then, $2x + 4y = 1600$
or, $x + 2y = 800$ ... (i)
Also, $x + 6y = 1600$ ... (ii)
Solving equations (i) and (ii), we get
$4y = 800$ or, $y = 200$
$\therefore$ cost of 12 shirts $= 12 \times 200 = ₹2400$

10. (b) CP of 150 calculators $= 150 \times 250 = ₹37,500$.
$\therefore$ total CP $= 37,500 + 2500 = ₹40,000$
Marked price of 150 calculators $= 150 \times 320 = ₹48,000$

Selling price after discount $= 48000 \times \frac{95}{100}$

$= ₹45,600$

$\therefore$ Percentage profit $= \frac{45,600 - 40,000}{40,000} \times 100 = 14\%$

11. (c) Original S.P. of company $= \frac{25000 \times 100}{85} = ₹29411.8$

$\therefore$ Approximate total S.P. $= \frac{29411.8 \times 108}{100} \simeq ₹32000$

12. (e) Cost price $= \frac{720 \times 100}{120} = ₹600$;

S.P. at no discount $= \frac{720 \times 100}{90} = ₹800$

$\therefore$ % profit $= \frac{200 \times 100}{600} = 33\frac{1}{3}\%$

13. (c) Successive discount $= 20\% + \frac{20 \times 80}{100}$

$= 20 + 16 = 36\%$
Difference in discount $= 36 - 35 = 1\%$
$\therefore$ Bill amount $= 22 \times 100 = ₹2200$

14. (a) Let the CP = ₹ 100 Marked price = ₹ 120

Discount $= \frac{312}{31.2} \times \frac{1}{100} = 10\% = ₹12$

SP = 120 – 12 = ₹ 108 Profit% = 108 – 100 = 8%

15. (c) Discount is calculated on marked price (M.P.) and profit is calculated on cost price (C.P.).
According to the question,

$\text{C.P.} \times \frac{100 + 23.5}{100} = \text{M.P.} \times \frac{95}{100}$

$\text{C.P.} = \frac{\text{M.P.} \times 95}{123.5}$

When no discount is given, then

$$\text{Profit} = \text{M.P.} - \frac{\text{M.P.} \times 95}{123.5}$$

$$= \frac{28.5 \times \text{M.P.}}{123.5}$$

$$\text{Profit} = \frac{\frac{28.5 \times \text{M.P.}}{123.5}}{\frac{\text{M.P.} \times 95}{123.5}} \times 100$$

$$= \frac{28.5}{9} \times 100 = 30\%$$

16. (e) Marked price $= 266 \times \frac{100}{95}$ ₹ 280

Cost price $= 280 \times \frac{100}{112} =$ ₹ 250

17. (a) Let the profit or loss be ₹ x

and $832 - x = 448 + x$ or, $x = \frac{384}{2} =$ ₹ 192

$\therefore$ Cost price of the article $= 832 - x = 448 + x =$ ₹ 640

$\therefore$ SP of the article $= 640 \times \frac{150}{100} =$ ₹ 960

18. (d) Let he purchase of ₹ x/kg.

$\therefore (525 + 30x) \times \frac{120}{100} = 60 \times 18.60$

$\Rightarrow x =$ ₹ 13.5 / kg.

19. (b) $CP = \frac{200}{125} \times 100 =$ ₹ 160

$\therefore$ CP of 6 articles $= 6 \times 160 =$ ₹ 960

$\therefore$ profit $= 1056 - 960 = 96$

Percentage profit $= \frac{96}{960} \times 100 = 10\%$

20. (d) Original price $= 1120 \times \frac{100}{70} \times \frac{100}{80} =$ ₹ 2000

21. (c) Let the selling price of the article be ₹ 100.

$\therefore$ Profit = ₹ 26

$\therefore$ Cost price of the article $= 100 - 26 =$ ₹ 74

$\therefore$ Reqd. $\% = \frac{34 \times 74}{100} = 25.16\%$

22. (b) S.P. for 1 egg = ₹ $\frac{5}{10}$ = ₹ $\frac{1}{2}$

$\therefore$ C. P. for 1 egg $= \frac{100}{(100 + 20)} \times \frac{1}{2} =$ ₹ $\frac{5}{12}$

$\Rightarrow$ He bought 12 eggs for 5 rupees.

23. (c) $\frac{1}{36} : (100 - 4) :: x : (100 + 8)$

$\Rightarrow x = \frac{108}{96 \times 36} = \frac{1}{32}$

He sells 32 oranges per rupee.

24. (b) C.P. for one coconut = ₹ $\frac{150}{100}$ = ₹ $\frac{3}{2}$

S.P. for one coconut = ₹ 2

Profit on one coconut $= 2 - \frac{3}{2} =$ ₹ $\frac{1}{2}$

$\therefore$ Profit on 2000 coconut $= \frac{1}{2} \times 2000 =$ ₹ 1000

25. (a) Let C.P. = ₹100, then M. P. = ₹ 150
S.P. = 70% of 150 = ₹ 105

$\therefore$ % profit $= \frac{105 - 100}{100} \times 100 = 5\%$

26. (b) Let S. P. = ₹ x per kg
$\therefore$ S.P. of 2 kg of rice = ₹ $2x$ = Loss
Now, Loss = C.P. – S.P.
$2x = 600 - 10x$
$\Rightarrow x =$ ₹ 50 per kg

27. (a) C.P. for one orange = ₹ $\frac{1}{15}$

Then S.P. $= \frac{(100 + 25)}{100} \times \frac{1}{15} = \frac{125}{100 \times 15} = \frac{1}{12}$

Hence S.P. for one orange = ₹ $\frac{1}{12}$

$\therefore$ 12 oranges must be sold for a rupee

28. (b) C.P. of one litre = ₹ 6
After adding water to it

One has to pay ₹ 7.20 for $\frac{2}{3}$ litre of milk.

So S.P. of $\frac{2}{3}$ litre of milk = ₹ 7.20

$\Rightarrow$ S.P. of 1 litre of milk = ₹ $\frac{7.20 \times 3}{2} =$ ₹ 10.80

$\because$ S.P. > C.P.

Hence gain $= \frac{10.80 - 6}{6} \times 100 = \frac{4.80}{6} \times 100$
$= 0.80 \times 100 = 80\%$

29. (b) Let profit per litre = ₹ 20
So, C.P. / litre = ₹ 100
S.P. / litre = ₹ 120
On adding 10% water to the milk

C.P. / $\frac{9}{10}$ litre = ₹ 100

S.P. / $\frac{9}{10}$ litre = ₹ 120

S.P. / litre = ₹ $\frac{120 \times 10}{9} =$ ₹ $\frac{400}{3}$

$\Rightarrow$ Profit / litre $= \frac{400}{3} - 100 = 33.33$

% by which profit increases $= 33.33 - 20 = 13.3$

30. (b) C.P. of 200 kg of mixture $= ₹(80 \times 13.50 + 120 \times 16)$
$= ₹\ 3000.$

S.P. $= 116\%$ of ₹3000 $= ₹\left(\frac{116}{100} \times 3000\right) = ₹\ 3480.$

$\therefore$ Rate of S.P. of the mixture $= ₹\left(\frac{3480}{200}\right)$ per kg

$= ₹\ 17.40$ per kg.

31. (a) He gives 800 grams but charges the price of 1000 grams (1 kg) $\Rightarrow$ on every 800 grams, he gains (1000 – 800) grams i.e. 200 grams.

$\therefore$ His gain $\% = \frac{200}{800} \times 100\% = 25\%$

Short cut : Gain $\% = \frac{\text{error}}{\text{true weight} - \text{error}} = 100\%$

32. (a) C.P. of 150 calculators
$= 150 \times 250 + 2500 = 37500 + 2500 = ₹\ 40000$
Labelled price of 150 calculators
$= 150 \times 320 = ₹48000$
Discount allowed = 5%
$\therefore$ S.P. of 150 calculators
$= 48000 - 5\% = ₹\ 45600$

$\therefore$ Profit $\% = \frac{5600}{40000} \times 100 = 14\ \%$

33. (b) $\frac{\text{True weight}}{\text{False weight}} = \frac{100 + \text{gain}\%}{100 + x}$

Here S.P. = C. P. $\therefore x = 0$

$\Rightarrow$ False weight $= \frac{1000 \times 100}{125} = 800$ gm

34. (c) Let cost Price = ₹ 100
$\therefore$ Marked price = ₹ 135
After discount, selling price $= 135 - 13.5 = 121.5$
$\therefore$ Profit% $= 121.5 - 100 = 21.5\%$

35. (a) S.P. of the 1st chair = ₹ 500
Gain = 20%

$\therefore$ C.P. of the 1st chair $= \frac{500 \times 100}{100 + 20} = \frac{500 \times 100}{120}$

$= \frac{1250}{3}$

S.P. of the 2nd chair = ₹ 500
Loss = 12%

$\therefore$ C.P. of the 2nd chair $= \frac{500 \times 100}{100 - 12} = \frac{500 \times 100}{88}$

$= \frac{500 \times 25}{22} = \frac{250 \times 25}{11} = \frac{6250}{11}$

Now S.P. of both the chairs = ₹ 1000
C.P. of both the chairs

$= \frac{1250}{3} + \frac{6250}{11} = \frac{13750 + 18750}{33} = \frac{32500}{33}$

$\therefore$ Net gain $= 1000 - \frac{32500}{33} = \frac{500}{33}$

$\Rightarrow$ Gain $\% = \frac{500/33}{32500/33} \times 100 = \frac{500}{32500} \times 100$

$= \frac{100}{65} = \frac{20}{13} = 1.5\%$ (To one place of decimal)

36. (a) Women's shirt comprise 60% of the output.
$\therefore$ Men's shirts comprise (100 – 60) = 40% of the out put.
$\therefore$ Average profit from men's shirt = 8% of 40 = 3.2 out of 40
Overall average profit = 6 out of 100
$\therefore$ Average profit from women's shirts = 2.8 out of 60
i.e. 0.0466 out of each shirt.

37. (c) Here, in whole transaction, there is neither gains nor loss, therefore,
Amount of gain in one watch
= Amount of loss in other watch
$\Rightarrow 0.15 \times CP_1 = 0.10 \times CP_2$

$\Rightarrow \frac{CP_1}{CP_2} = \frac{0.10}{0.15} = \frac{2}{3}$

Also $CP_1 + CP_2 = 560$

$\therefore\ CP_1 = \frac{2}{(2+3)} \times 560 = ₹\ 224$

and $CP_2 = 560 - 224 = ₹\ 336$

38. (b) Let the C.P. of horse = ₹ x
Then the C.P. of carriage = ₹ (3000 – x)
20% of x – 10% of (3000 – x) = 2% of 3000

$\Rightarrow \frac{x}{5} - \frac{(3000 - x)}{10} = 60$

$\Rightarrow 2x - 3000 + x = 600$

$\Rightarrow 3x = 3600 \Rightarrow x = 1200$

39. (d) Here, $SP_1 = SP_2$

$\Rightarrow 140\ CP_1 = 60 CP_2 \Rightarrow \frac{CP_1}{CP_2} = \frac{6}{14} = \frac{3}{7}$

$\therefore\ CP_1 = \frac{3}{(3+7)} \times 8000 = ₹\ 2400$

and $CP_2 = 8000 - 2400 = ₹\ 5600$

40. (b) Let the C.P. be ₹ 100
First S.P. = ₹115
Second C.P. = ₹ 90
Second S.P = 125% of ₹ 90 = ₹ 112.50
Difference of two selling prices is ₹ 115 – ₹ 112.50
= ₹ 2.50 and C.P. of the article is ₹ 100
But actual difference is ₹ 4.

$\therefore$ C.P. $= \frac{100}{2.50} \times ₹\ 4 = ₹\ 160.$

41. (a) Let the CP of the article be ₹ x.

Then, SP = ₹ $\frac{105x}{100}$

Now, new CP = ₹ $\frac{95x}{100}$ and new SP = $\frac{105x}{100} - 1$

According to the question

$\frac{105x}{100} - 1 - \frac{95}{100} = \frac{10 \times 95x}{100 \times 100}$

$\therefore$ x = ₹ 200

42. (a) Let S.P. = ₹ x per kg

$\therefore$ S.P. of 4 kg = ₹ 4x

$\therefore \quad 4x = \frac{100 - 40}{100} \times 300$

$\Rightarrow x = \frac{270}{4} =$ ₹ 67.50

43. (a) Let C.P. of one orange = ₹ 1
Then C.P. of 8 oranges = ₹ 8
S.P of 8 oranges = ₹ 9

$\therefore$ Gain % $= \frac{9-8}{8} \times 100 = \frac{100}{8} = 12\frac{1}{2}\%$

44. (c) Let C.P. of 1 article = ₹ 1
then C.P. of 25 articles = ₹ 25
and S.P. of 25 articles = ₹ 20

$\therefore$ loss % $= \frac{25-20}{20} \times 100 = 25\%$

45. (d) Let C.P. of one metre of cloth = ₹ 1
then C.P. of 66 metres of cloth = ₹ 66
Gain = C.P. of 22 metres = ₹ 22

% gain $= \frac{22}{66} \times 100 = 33\frac{1}{3}\%$

OR

If on selling 'x' articles, a man gains equal to the C.P. of 'y' articles, then % gain $= \frac{y}{x} \times 100$

$\therefore$ % gain $= \frac{22}{66} \times 100 = 33\frac{1}{3}\%$

46. (b) Loss = C.P. of 66 metres – S.P. of 66 metres
= S.P. of 22 metres
$\Rightarrow$ C.P. of 66 metres = S.P. of 88 metres

% loss $= \frac{\text{loss}}{\text{C.P. of 66 metres}} \times 100$

$= \frac{\text{S.P of 22 metres}}{\text{C.P of 66 metres}} \times 100$

$= \frac{\text{S.P. of 22 metres}}{\text{S.P.of 88 metres}} \times 100$

$= \frac{22}{88} \times 100 = 25\%$

* Try to solve by shortcut method

47. (b) Equivalent discount = $10 + 20 - \frac{10 \times 20}{100}$

$= 30 - 2 = 28\%$

48. (c) Retailer price = list price $\left(1 - \frac{d_1}{100}\right)\left(1 - \frac{d_2}{100}\right)$

$\Rightarrow 122.40 = 160\left(1 - \frac{10}{100}\right)\left(1 - \frac{d_2}{100}\right)$

$\Rightarrow 1 - \frac{d_2}{100} = \frac{122.40 \times 100}{160 \times 90} = 0.85$

$\Rightarrow d_2 = (1 - 0.85) \times 100 = 15\%$

49. (b) Let the C.P. of the goods be ₹ 100
$\Rightarrow$ Marked price of the goods = ₹ 120
Discount = 10% $\Rightarrow$ S.P. is 90% of ₹ 120 = ₹ 108
$\therefore$ Gain = (108 – 100) i.e. 8%.

50. (d) For same article, $\frac{100 - d_1}{100 - d_2} = \frac{100 + g_1}{100 + g_2}$

$\Rightarrow \frac{100 - 25}{100 - 10} = \frac{100 + 25}{100 + g_2} \Rightarrow \frac{75}{90} = \frac{125}{100 + g_2}$

$\Rightarrow 100 + g_2 = \frac{90 \times 125}{75} = 150 \Rightarrow g_2 = 50\%$

51. (c) SP = 90 × 1.2 = ₹ 108

Marked price = $\frac{108}{0.85}$ = ₹ 127.05

52. (d) Let the SP of the article be ₹ x
Expenses = 15% of x = ₹ 0.15x
Profit = 10% of x = ₹ 0.10x
CP = ₹ 9 (given)
Therefore, 9 + 0.15x + 0.1x = x $\Rightarrow$ x = 12

$\therefore$ % increase for marked price = $\frac{12-9}{9} \times 100$

$= \frac{100}{3}\%$