CHAPTER

5

PROFIT & LOSS

PROFIT AND LOSS

This chapter helps you to understand the intricacies of business world and the computation of profit or loss arising out ofbusiness Transactions.

Various concepts related to this topic are :

Cost Price (CP): It is the price at which the item is procured by the seller.

Selling Price (SP): It is the price at which the item is sold by the seller.

Profit: It is the excess of the selling price over cost price, i.e. Profit = SP – CP

Loss: It is the excess of cost price over the selling price, i.e.

Loss = CP – SP

Profit Percent : It is profit, expressed as a percentage of cost price, i.e.

$$\text{Profit Percent} = \frac{\text{Profit}}{\text{CP}} \times 100$$

Loss Percent: It is loss, expressed as a percentage of cost price,

i.e, $$\text{Loss Percent} = \frac{\text{Loss}}{\text{CP}} \times 100$$

Note: It should be kept in mind, that both profit and loss percent are calculated on cost price.

Formulas to ascertain cost price or selling price when profit or loss percent are given-

To Find SP when Profit or Loss Percent & CP are given-

- In case Profit percent & CP is given,
  Then
- In case Loss percent & CP is given,
  Then

$$\text{SP} = \left[\frac{100 - \text{Loss}\%}{100}\right] \times \text{CP}.$$

ILLUSTRATION ▶ 1: A shopkeeper buys scientific calculators in bulk for ₹ 15 each. He sells them for ₹ 40 each.
Calculate the profit on each calculator in rupees, and as a percentage of the cost price.

Sol. Given: cost price = ₹ 15,
selling price = ₹ 40
profit = selling price - cost price
= ₹ 40 – 15 = ₹ 25
the profit as a percentage of the cost price:

$$\text{Profit \%} = \frac{\text{profit}}{\text{cost price}} \times 100\%$$

$$= \frac{25 \times 100}{15}\% = 166.7\%$$

ILLUSTRATION ▶ 2 : If the cost price of a book is ₹ 150 and selling price is 137.50, then calculate the loss and percentage loss on the book?

Sol. Here, cost price = ₹ 150
and selling price = ₹ 137.50
∴ Loss = Cost price – selling price
= ₹ (150 – 137.50) = ₹ 12.50

$$\text{Now, Percentage Loss} = \frac{\text{Loss} \times 100}{\text{Cost Price}}\ \%$$

$$= \frac{12.50 \times 100}{150}\%$$

$$= 8.33\%$$

ILLUSTRATION ▶ 3 : A chair was purchased for ₹ 470 and sold at a profit of 10%. Find the selling price.

Sol. Using the formula

$$\text{Selling price} = \text{cost price} \left(\frac{100 + \text{profit}\%}{100}\right)$$

$$= 470\left(\frac{100 + 10}{100}\right)$$

$$= 470 \times \frac{110}{100} = ₹ 517$$

ILLUSTRATION ▶ 4 : A person bought a table for ₹ 420 and sold it at a loss of 15% . Find the selling price of the table.

Sol. $$\text{Selling price} = \text{cost price} \left(\frac{100 - \text{Loss}\%}{100}\right)$$

$$= ₹ 420 \left(\frac{100 - 15}{100}\right) = \frac{420 \times 85}{100} = ₹ 357$$

- **When selling price and percentage profit are given, then**

$$\text{Cost price} = \text{selling price}\left(\frac{100}{100+\text{profit}\%}\right)$$

To find CP when profit or loss percent & SP are given-

- In case profit percent & SP is given,

$$\text{Then CP} = \left[\frac{100}{100+\text{Profit}\%}\right]\times \text{SP}$$

- In case loss percent & SP is given,

$$\text{Then CP} = \left[\frac{100}{100-\text{Loss}\%}\right]\times \text{SP}$$

ILLUSTRATION ▶ 5 : A Chair was sold for ₹ 517 at a profit of 10%. Find the cost price of the chair.

Sol. Here, selling price = ₹ 517
and profit = 10%

$$\therefore \quad \text{Cost price} = \text{selling price}\left(\frac{100}{100+\text{profit}\%}\right)$$

$$= 517\left(\frac{100}{100+10}\right)$$

$$= 517\times\frac{100}{110} = ₹470$$

ILLUSTRATION ▶ 6 : Ram sold a watch for ₹ 376 at a loss of 6%. Find the cost price of the watch.

Sol. $\text{Cost price} = \text{selling price}\left(\frac{100}{100-\text{Loss}\%}\right)$

$$= ₹376\times\left(\frac{100}{100-6}\right)$$

$$= ₹376\times\frac{100}{94} = ₹400$$

Advanced Conditions

- If two items are sold each at rupees R, one at a gain of x% and other at a loss of x %, there is always an overall loss given by $\frac{x^2}{100}$ % and the value of loss is given by $\frac{2x^2R}{(100^2-x^2)}$. In case the cost price of both the items is the same and percentage loss and gain are equal, then net loss or profit is zero. The difference between the two cases is that the cost price in the first case is not the same, and in the second case it is the same.

ILLUSTRATION ▶ 7 : Ram sells two Mobile phones for ₹ 1000 each, one at a profit of 10% and other at a loss of 10%. Find his gain or loss percentage.

Sol. Using the formula, Loss %

$$= \left(\frac{x^2}{100}\right)\% = \left(\frac{10\times10}{100}\right)\% = 1\%$$

$$\text{Loss in terms of rupees} = \frac{2x^2R}{(100^2-x^2)}$$

$$= \frac{2\times10^2\times1000}{100^2-10^2} = \frac{200000}{9900}$$

$$= ₹20.20$$

- **A dishonest shopkeeper claims to sell goods at cost price, but uses a lighter weight, then his Gain %**

$$= \left[\frac{100\times\text{excess}}{(\text{original value}-\text{excess})}\right]$$

Where excess = amount by which the correct weight is more than the lighter weight.

ILLUSTRATION ▶ 9 : A shopkeeper professes to sell sugar at cost price, but uses a false weight which reads 1000 gms for 900 gm. What is his profit percent?

Sol. Using the formula,

$$\text{Profit Percent} = \frac{100\times\text{excess}}{\text{original value}-\text{excess}}$$

$$= \frac{100\times(1000-900)}{1000-100}$$

$$= \frac{100\times100}{900}\frac{100}{9} = 11.11\%$$

Alternet Method: Shopkeeper net profit = 100gms
$\therefore$ CP of 1000 gms = SP of 900 gms

$$\text{So profit percent} = \frac{100}{900}\times100$$

$$= 11.11\%$$

ILLUSTRATION ▶ 9 : A shopkeeper sells rice to a customer, using false weights and gains $\frac{100}{8}$ % on his cost. What weight has he substituted for a kilogram?

Sol: Using the formula, Gain %

$$= \left[\frac{100\times\text{excess}}{(\text{original value}-\text{excess})}\right]$$

$$\Rightarrow \frac{100}{8} = \left[\frac{100\times\text{excess}}{(1-\text{excess})}\right]$$

From here, Excess = 0.111 Kg, which is 111.11 grams
Weight used by shopkeeper = 1000 - 111.11 = 888.89 grams

Alternet Method: To earn a profit of $\left(\frac{100}{8}\right)\%$ i.e. 12.5%, the shopkeeper needs to make 1.125 kgs out of 1 kg. So he will be selling $\frac{1000}{1.125}\text{gms} = 888.88\text{gms}$ in place of 1 kg.

To find profit or loss percent, when price of goods is not specified, i.e. only quantity purchased and sold is given–

In these questions cost prices of a given units of goods is compared with the selling price of another units of goods. Following formula is used to ascertain Profit/Loss percent

$$= \frac{\text{Difference in goods}}{\text{goods sold}} \times 100$$

ILLUSTRATION ▶ 10 : The CP of 50 articles is equal to the selling price of 40 articles. What is profit or loss percent?

Sol: Since, loss items are sold to recover the cost of more items, Terefore it is a case of profit.

$$\therefore \text{ Profit percent} = \frac{10}{40} \times 100$$

ILLUSTRATION ▶ 11 : The CPof 50 articles is equal to the selling price of 70 articles. What is the profit/loss percent?

Sol: Since, more items are sold to recover the cost of less items, then it is a condition of loss.

$$\therefore \text{ Profit percent} = \frac{20}{70} \times 100 = 28.57\%$$

Ready to Explore some more:

List Price: This price is fixed by the shopkeeper over and above the selling price in anticipation that he would be asked for a discount. It is also known as market- up price.

$$\text{LP} \xrightarrow{\%\text{decrease}} \text{SP} \xrightarrow{\%\,\text{Profit/Loss}} \text{CP}.$$

To find markup percent over price when profit and discout

$$\text{percent are given} = \left[\frac{\text{MP}}{\text{CP}} - 1\right] \times 100 .$$

ILLUSTRATION ▶ 12 : After selling an article at a discount of 20%, profit percentage obtained is 10%. What is the mark-up over CP?

Sol: $0.8\,\text{MP} = 1.1\,\text{CP}$

$$\frac{\text{MP}}{\text{CP}} = \frac{1.1}{0.8}$$

$$\text{Mark-up percent} = \left[\frac{\text{MP}}{\text{CP}} - 1\right] \times 100 = \left[\frac{1.1}{0.8} - 1\right] \times 100$$

$$= \frac{1.1 - 0.8}{0.8} \times 100 = 37.5\%$$

Computation of discount percent when buy 'x' get 'y' free scheme is launched:

$$\text{Discount percent} = \frac{\text{Free Units}}{\text{Total Units}} \times 100$$

ILLUSTRATION ▶ 13 : Big Bazaar is offering "Buy 2, get 1 free" on household items. What is the net percentage discount being offered by the store?

Sol: According to the formula given above,

$$\text{Net Discount Percent} = \frac{\text{Free Unit}}{\text{Total Unit}} \times 100$$

$$= \frac{1}{(2+1)} \times 100 = 33.33\%$$

ILLUSTRATION ▶ 14 : A Shopkeeper marks up his goods by 20% and gives a discount of 5%. Also, he uses a false balance, which reads 1000 gins for 750 gins. What is his total profit percent?

Sol: Let the CP per gm be 0.10

Accordingly CP of 1 kg i.e. 1000 gms = ₹100.

Selling price of 750 gms

$= [100 \times 120\% - 5\% \text{ of } 120]$

$= 120 - 6 = 114.$

Cost Price of 750 gms = 75.

Profit = 114 – 75 = 39

$$\text{Profit percent} = \frac{39}{75} \times 100 = 52\%$$

When goods are purchased in bulk, and then sold in parts, then to find required profit percent on remaining goods, so as to earn an overall profit percent:

ILLUSTRATION ▶ 14 : A dealer in toys, bought some electronic Chinese toys for ₹10,000. He sold half of the goods @ 10% profit. At what percent profit should be sell the remaining goods so as to earn an overall profit of 20% ?

Sol. $\text{Desired Total profit} = 10,000 \times \frac{20}{100} = 2000.$

$$\text{Profit on goods sold} = 5000 \times \frac{10}{100} = 500$$

Remaining Profit = 2000 – 500 = 1500.

$$\text{Profit Percent} = \frac{1500}{5000} \times 100 = 30\%$$

Alternate Method:

$$\frac{1}{2} \times 10 + \frac{1}{2} \times (x) = 20$$

$$5 + \frac{x}{2} = 20$$

$$\frac{x}{2} = 15$$

$$x = 15 \times 2 = 30\%$$

Note : If an article is sold at a gain of say, 20% then S.P = 120% of C.P. So, instead of first finding 20% of CP and then adding, it would be simple to calculate it as given above.

Also, if an article is sold at a loss of say, 20%, then S.P = 80% of CP.

Formulae to Remember

When selling price of an article is greater than the cost price:

- Profit = Selling price – cost price
- Selling price = cost price + profit
- Cost price = selling price – profit
- $\text{Profit \%} = \frac{\text{profit}}{\text{cost price}} \times 100$
- $\text{Profit} = \frac{\text{cost price} \times \text{profit\%}}{100}$
- $\text{Profit} = \text{cost price} \times \left(\frac{100 + \text{profit\%}}{100}\right)$
- $\text{Selling price} = \text{cost price} \times \left(\frac{100 \times \text{selling price}}{100 + \text{profit\%}}\right)$

When selling price of an article is less than the cost price:

- Loss = cost price – selling price
- Selling price = cost price – loss
- Cost price = selling price + loss
- $\text{Loss\%} = \frac{\text{Loss}}{\text{Cost price}} \times 100$
- $\text{Loss} = \frac{\text{Cost price} \times \text{Loss\%}}{100}$
- $\text{Selling price} = \text{cost price} \times \frac{(100 - \text{Loss\%})}{100}$
- $\text{Cost price} = \frac{100 \times \text{selling price}}{100 - \text{Loss\%}}$

SOLVED EXAMPLES

EXAMPLE ▶ 1: The owner of a cellphone shop charges his customers 32% more than the cost price. If a customer paid ₹ 6600 for the cellphone, then what was the cost price of the cell phone ?

(a) ₹ 5800 **(b) ₹ 6100**
(c) ₹ 5000 **(d) ₹ 5400**
(e) None of these

Sol. (c) CP of a cellphone

$$\frac{SP \times 100}{100 + Profit\,\%}$$

$$= 6600 \times \frac{100}{100 + 32}$$

$$= \frac{6600 \times 100}{132} = 5000$$

EXAMPLE ▶ 2 : Mohan bought a cycle for ₹ 475 and then sold it at a loss of 8% of the cost price. For how much did he sell the cycle ?

(a) ₹ 453 **(b) ₹ 419**
(c) ₹ 441 **(d) ₹ 437**
(e) None of these

Sol. (d) SP of the cycle $= CP\frac{[100 - loss\%]}{100}$

$$= \left(\frac{92}{100} \times 475\right) = ₹ 437$$

EXAMPLE ▶ 3 : A person subscribing to Sky Cable for one year pays ₹1,785. If the monthly subscription is ₹ 175, how much discount does a yearly subscriber get ?

(a) 18% **(b) 11%**
(c) 13% **(d) 15%**
(e) None of these

Sol. (d) Total annual subscription = ₹ (175 × 12) = ₹ 2100
Actual subscription = ₹ 1785
∴ Discount = ₹ (2100 – 1785) = ₹ 315

$$\therefore \text{ Discount percent} = \frac{315}{2100} \times 100 = 15\%$$

Note: It is calculated on total cost.

EXAMPLE ▶ 4 : The labelled price of a product is ₹750. If it is sold at a 20% discount and still the dealer earns a 25% profit, what is the cost price ?

(a) ₹ 550 **(b) ₹ 450**
(c) ₹ 435 **(d) ₹ 480**
(e) None of these

Sol. (d) SP of the product = List Price – Discount

$$\text{or, } \frac{(100 - \text{discount}\%)}{100} \times LP$$

$$\frac{SP \times 100}{100 + Profit\,\%}$$

$$= \left(\frac{80}{100} \times 750\right) = ₹ 600$$

Profit = 25 %

$$\therefore \quad CP = \frac{100}{125} \times 600 = ₹ 480$$

In a single step

$$CP = \left[\frac{100 - \text{discount}\%}{100}\right]\left[\frac{100}{100 + Profit\%}\right] \times LP$$

EXAMPLE ▶ 5 : In a sale, a pair of trousers is available at 15% discount on the selling price. The trousers' discounted selling price is ₹ 837.25 in the sale. What was the original selling price of the trousers?

(a) ₹ 995 **(b) ₹ 990**
(c) ₹ 1,005 **(d) ₹ 985**
(e) ₹ 1,012

Sol. (d) Required selling price

$$= \left(\frac{100}{85} \times 837.25\right) ₹ = 985 ₹$$

EXAMPLE ▶ 6 : A gold bracelet is sold for ₹ 14,500 at a loss of 20%. What is the cost price of the gold bracelet?

(a) ₹ 18,125 **(b) ₹ 17,400**
(c) ₹ 15,225 **(d) ₹ 16,800**
(e) None of these

Sol. (a) Cost price of bracelet $= \frac{\text{selling price} \times 100}{100 - Loss\%}$

$$\therefore \text{ Cost Price of bracelet} = \frac{14500 \times 100}{80} = ₹ 18125$$

EXAMPLE ▶ 7 : The cost of 16 kgs of sugar is ₹ 448. The cost of 18kgs of rice is ₹ 756 and the cost of 14 kgs of wheat is ₹ 546. What is the total cost of 23 kgs of sugar, 26 kgs of rice and 21 kgs of wheat?

(a) ₹ 2,585 **(b) ₹ 2,615**

(c) ₹ 2,555 **(d) ₹ 2,600**

(e) None of these

Sol. (c) $\because$ CP of 16 kg of sugar = ₹ 448

$\therefore$ CP of 23kg of sugar $\frac{448}{16} \times 23 = ₹644$

similarly, CP of 26 kg of rice

$= \frac{756 \times 26}{18} = ₹1092$

and CP of 21 kg of wheat

$= \frac{546}{14} \times 21 = ₹819$

Required price

= ₹(644 + 1092 + 819)

= ₹2555

EXAMPLE ▶ 8 : The profit earned after selling an article for ₹ 996 is the same as loss incurred after selling the article for ₹ 894. What is the cost price of the article ?

(a) ₹ 935 **(b) ₹ 905**

(c) ₹ 945 **(d) ₹ 975**

(e) None of these

Sol. (c) Cost price $= \frac{996 + 894}{2}$

$= ₹945$

EXAMPLE ▶ 10 : Shri Ramlal purchased a TV set for ₹ 12,500 and spent ₹ 300 on transportation and ₹ 800 on installation. At what price should he sell it so as to earn an overall profit of 15%?

(a) ₹ 14,560 **(b) ₹ 14,375**

(c) ₹ 15,460 **(d) ₹ 15,375**

(e) None of these

Sol. (e) Selling price

$= (12500 + 300 + 800) \times \frac{115}{100}$

$= 13600 \times \frac{115}{100}$

= ₹ 15640

EXERCISE

1. Mohan bought a watch with 25% discount on the selling price. If the watch cost him ₹ 1,545, what is the original selling price of the watch?
   (a) ₹2,050 (b) ₹2,000
   (c) ₹2,040 (d) Cannot be determined
   (e) None of these
2. The owner of an electronics shop charges his customer 22% more than the cost price. If a customer paid ₹ 10,980 for a DVD player, then what was the cost price of the DVD player?
   (a) ₹8000 (b) ₹8800
   (c) ₹9500 (d) ₹9200
   (e) None of these
3. The owner of a stationery shop charges his customers 28% more than the cost price. If a customer paid ₹ 4544 for school books, then what was the cost price of the school books ?
   (a) ₹3550 (b) ₹3500
   (c) ₹3450 (d) ₹3400
   (e) None of these
4. When the original price of a toy was increased by 25% the price of one dozen toys was ₹ 300. What was the original price of one toy?
   (a) ₹24 (b) ₹29
   (c) ₹30 (d) ₹15
   (e) ₹20
5. The owner of an electronics shop charges his customers 25% more than the cost price. If a customer paid ₹ 11,500 for a television set, then what was the cost price of the television set?
   (a) ₹9,200 (b) ₹7,200
   (c) ₹8,600 (d) ₹9,800
   (e) ₹10,000
6. Vinita bought a watch with 24% discount on the selling price. If the watch cost her ₹ 779, what is the original selling price of the watch?
   (a) ₹1000 (b) ₹950
   (c) ₹1040 (d) Cannot be determined
   (e) None of these
7. The owner of a toy shop charges his customers 33% more than the cost price. If the customer paid ₹4,921 for a toy, then what was the cost price of the toy?
   (a) ₹3,850 (b) ₹3,700
   (c) ₹3,550 (d) ₹3,900
   (e) None of these
8. Mohan purchased an article and sold it for ₹ 2817.50 and earned 15 percent profit on the cost price. What was the cost price of the article?
   (a) ₹2,500 (b) ₹2,450
   (c) ₹2,540 (d) ₹3,315
   (e) None of these
9. The profit earned after selling an article for ₹ 1,754 is the same as loss incurred after selling the article for ₹ 1,492. What is the cost price of the article?
   (a) ₹ 1,623 (b) ₹ 1,523
   (c) ₹ 1,689 (d) ₹ 1,589
   (e) None of these
10. Prathik sold a music system to Karthik at 20% gain and Karthik sold it to Swasthik at 40% gain. If Swasthik paid ₹10,500 for the music system, what amount did Prathik pay for the same?
   (a) ₹8,240 (b) ₹7,500
   (c) ₹6,250 (d) Cannot be determined
   (e) None of these
11. In a sale, a perfume is available at a discount of 15% on the selling price. If the perfume's discounted selling price is ₹ 3675.40, what was the original selling price of the perfume?
   (a) ₹ 4,324 (b) ₹ 4,386
   (c) ₹ 4,400 (d) ₹ 4,294
   (e) None of these
12. What profit/loss percent did Ravi earn if he purchased an item of ₹ 5,600 and sold it at three-fourth of its cost price?
   (a) Loss of 20 percent
   (b) Gain of 25 percent
   (c) Neither gain nor loss
   (d) Loss of 25 percent
   (e) None of these
13. An article was purchased for 78,350/–. Its price was marked up by 30%. It was sold at a disount of 20% on the marked up price. What was the profit percent on the cost price?
   (a) 10 (b) 6
   (c) 4 (d) 2
   (e) None of the above
14. Manhar sold an item for ₹8400 and incurred a loss of 25%. At what price should be have sold the item to have gained a profit of 40%?
   (a) ₹15,680 (b) ₹16,220
   (c) ₹14,540 (d) Cannot be determined
   (e) None of the above

15. Prashant incurred a loss of 75% on selling an article for ₹6800. What was the cost price of the article ?
(a) 27,700 (b) 25,600
(c) 21,250 (d) 29,000
(e) None of these

16. A milkman sells 120 litres of milk for ₹3360 and he sells 240 litres of milk for ₹6120. How much discount does the trader 27. give per litre of milk, when he sells 240 litres of milk?
(a) ₹2 (b) ₹3.5
(c) ₹2.5 (d) ₹1.5
(e) None of the above

17. Ghanshyam purchased an article for ₹1850. At what price 28. should he sell it so that 30% profit is earned?
(a) ₹2450 (b) ₹2245
(c) ₹2405 (d) ₹2425
(e) None of the above

18. Vandana sells an article for ₹3240 and earns a profit of 20%. What is the cost price of the article?
(a) ₹2800 (b) ₹2820
(c) ₹2750 (d) ₹2700
(e) None of these

19. A DVD player was purchased for ₹4860. At what price it should be sold so that 25% profit is earned?
(a) ₹6225 (b) ₹6275
(c) ₹6075 (d) ₹6025
(e) None of these

Directions (20-22) : Study the information given below and 30. answer the questions that follow:

An article was bought for ₹5600. Its price was marked up by 12%. Thereafter it was sold at a discount of 5% on the marked price

20. What was the marked price of the article ?
(a) ₹6207 (b) ₹6242
(c) ₹6292 (d) ₹6192
(e) ₹6272

21. What was the percent profit on the transaction?
(a) 6.8% (b) 6.3%
(c) 6.4% (d) 6.6%
(e) 6.2%

22. What was the amount of discount given?
(a) ₹319.6 (b) ₹303.6
(c) ₹306.3 (d) ₹313.6
(e) ₹316.9

23. 21 articles were bought for ₹6531 and sold for ₹ 9954. How much was the approximate profit percentage per article ?
(a) 56% (b) 43%
(c) 52% (d) 49%
(e) 61%

24. The C.P. of an article is ₹1700. If it was sold at a price of 33. ₹2006, what was the percentage profit on the transaction ?
(a) 18 (b) 12
(c) 10 (d) 15
(e) 20

25. Meera purchased 23 bracelets at the rate of ₹160 per bracelet. At what rate per bracelet should she sell the bracelets so that profit earned is 15%?
(a) ₹184 (b) ₹186
(c) ₹192 (d) ₹198
(e) None of these

26. 'A' got 30% concession on the label price of an article sold for ₹8750 with 25% profit on the price he bought. The label price was
(a) ₹10,000 (b) ₹13,000
(c) ₹16,000 (d) ₹12,000
(e) None

27. The C.P. of a book is ₹ 150. At what price should it be sold to gain 20%?
(a) ₹80 (b) ₹120
(c) ₹180 (d) ₹100
(e) None

28. If books bought at prices ranging from ₹150 to ₹300 are sold at prices ranging from ₹250 to ₹350, what is the greatest possible profit that might be made in selling 15 books?
(a) ₹3000 (b) Cannot be determined
(c) ₹750 (d) ₹4250
(e) None

29. A man sold two articles at ₹375 each. On one, he gains 25% and on the other he loses 25%. The gain or loss % on the whole transaction is:
(a) 6% (b) $4\frac{1}{6}\%$
(c) ₹50 (d) $6\frac{1}{4}$
(d) None

30. A bought an article, paying 5% less than the original price. A sold it with 20% profit on the price he had paid. What percent of profit did A earn on the original price ?
(a) 10 (b) 13
(c) 14 (d) $\frac{17}{2}$
(d) None

31. The profit percent of a bookseller if he sells book at marked price after enjoying a commission of 25% on marked price will be:
(a) 30% (b) 25%
(c) 20% (d) 33%
(e) None

32. The printed price of a book is ₹320. A retailer pay ₹244.80 for it. He gets successive discounts of 10% and an another rate. His second rate is:
(a) 15% (b) 16%
(c) 14% (d) 12%
(e) None

33. A sells an article to B at a gain of 10%. B sells it to C at a gain of 5%. If C pays ₹462 for it, what did it cost to A?
(a) ₹500 (b) ₹450
(c) ₹600 (d) ₹400
(e) None

34. The profit obtained by selling a book for ₹56 is the same as the loss obtained by selling this book for ₹42. What is the cost price of the book ?
(a) ₹40 (b) ₹49
(c) ₹50 (d) ₹55
(e) None

35. By selling a toy for `150, a shop owner lost $\frac{1}{16}$th of what it cost to him. What is the C.P. of toy?
(a) `160 (b) `150
(c) `140 (d) `120
(e) None

36. Profit as a percentage of the selling price is 25%. Express it as apercentage of cost price.
(a) 25% (b) 20%
(c) $33\frac{1}{3}\%$ (d) 15%
(e) None

37. A man sold a book at a profit of 10%. if he had charged ₹45 more, his profit percentage would have been 25%. Find the C.P. of the book.
(a) ₹300 (b) ₹250
(c) ₹200 (d) ₹150
(e) None

38. A fruit-vendor buys 200 bananas for `10. How many bananas a rupee can he sell, so that his profit percentage is 25%.
(a) 10 (b) 14
(c) 16 (d) 20
(e) None

39. A shopkeeper professes to sell his good at C.P. only. But he uses 750 gm weight at the place of 1000 gm weight for a kg. What is his net profit percentage?
(a) 33.33% (b) 25%
(c) 20% (d) 16.67%
(e) None

40. Mohan bought a jute bag @ 30% discount on the list price. He then sold it at a price which is 160% of the list price thereby making a profit of `81. What is the list price of the bag?
(a) ₹90 (b) ₹100
(c) ₹180 (d) ₹200
(e) None

Answer Key

1	**(e)**	9	**(a)**	17	**(c)**	25	**(a)**	33	**(d)**
2	**(e)**	10	**(c)**	18	**(d)**	26	**(a)**	34	**(b)**
3	**(a)**	11	**(a)**	19	**(c)**	27	**(c)**	35	**(a)**
4	**(e)**	12	**(d)**	20	**(e)**	28	**(a)**	36	**(c)**
5	**(a)**	13	**(c)**	21	**(c)**	29	**(d)**	37	**(a)**
6	**(e)**	14	**(a)**	22	**(d)**	30	**(c)**	38	**(c)**
7	**(b)**	15	**(e)**	23	**(c)**	31	**(d)**	39	**(a)**
8	**(b)**	16	**(c)**	24	**(a)**	32	**(a)**	40	**(a)**

ANSWERS & EXPLANATIONS

1. (e) Let the marked price (SP) = ₹ x
According to the question,
75% of x = 1545

$$\text{or, } x = \frac{1545\times100}{75} = ₹\ 2060$$

2. (e) CP of DVD player = ₹ x
According to the question,

$$\because \quad x\left(1+\frac{22}{100}\right) = ₹\ 10980$$

$$\therefore \quad x = 10980 \times \frac{50}{61} = ₹\ 9000$$

3. (a) Cost Price

$$= \text{SP}\left[\frac{100}{100+\text{Profit}\,\%}\right]$$

$$= 4544\times\frac{100}{128} = 3550$$

4. (e) Cost Price of 12 toy's

$$= \text{SP}\times\frac{100}{100+\text{Profit}\,\%}$$

$$= 300\times\frac{100}{125} = 240$$

$$\therefore \text{ CP of 1 toy} = \frac{240}{120} = 20$$

5. (a) CP of television set

$$= ₹\left(\frac{11500\times100}{125}\right) = ₹9200$$

6. (e) Let the original selling price of watch = ₹x
According to the question,

$$x\times\frac{76}{100} = 779$$

$$\text{or, } x = \frac{779\times100}{76} = ₹1025$$

7. (b) Required cost price $= \dfrac{\text{SP}\times100}{100+\text{Profit}}$

$$= \frac{100\times4921}{133} = ₹3700$$

8. (b) Cost price $= \dfrac{2817.50\times100}{115}$

$$= ₹\ 2450$$

9. (a) Cost price

$$= \frac{1754+1492}{2} = ₹1623$$

10. (c) Required amount

$$= \frac{10500\times100\times100}{120\times140} = ₹6250$$

11. (a) Original selling price

$$= \frac{3675.4\times100}{85}$$

$$= ₹\ 4324$$

12. (d) Loss = 1/4 of the CP

$$\left(1-\frac{3}{4}\right) = \frac{1}{4}\times100$$

$$= 25\%$$

13. (c) MP = 78,350 × 130% = 101855
SP = 101855 × 80% = 81484
Profit = 81484 – 78350 = 3134

$$\text{Profit \%} = \frac{3134}{78350} \times 100 = 4\%$$

14. (a) $$\text{C.P.} = \frac{\text{SP} \times 100}{100 - \text{loss\%}}$$

$$= 8400 \times \frac{100}{100 - 25} = 111,200$$

$$\text{S.P} = \text{CP} \times \frac{100 + \text{P\%}}{100}$$

$$= 11,200 \times \frac{140}{100} = 15,680$$

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

$$= 6800 \times \frac{100}{100 - 75} = 27,200$$

16. (c) SP of 120 litres = 3360

$$\therefore \text{ SP of 1 litre} = \frac{3360}{120} = 28$$

SP of 240 litres = 6120

$$\therefore \text{ SP of 1 litre} = \frac{6120}{240} = 25.5$$

Discount per litre = 28 – 25.5 = 2.5

17. (c) $$\text{SP} = \text{CP} \times \frac{(100 + \text{Profit \%})}{100}$$

$$= 1850 \times \frac{130}{100} = 2405$$

18. (d) $$\text{CP} = \text{SP} \times \frac{100}{100 + \text{Profit \%}}$$

$$3240 \times \frac{100}{120} = 2700$$

19. (c) $$\text{SP} = \text{CP} \times \frac{(100 + \text{Profit \%})}{100}$$

$$= 4860 \times \frac{125}{100} = 6075$$

20. (e) M.P = 5600 × 112% = 6272
21. (c) SP = 6272 × 95% = 5958.4
Profit = 5958.4 – 5600 = 358.4

$$\text{Profit \%} = \frac{358.4}{5600} \times 100 = 6.4\%$$

22. (d) Discount = 6272 – 5958.4 = 313.6

23. (c) $$\text{Profit \%} = \frac{9954 - 6531}{6531} \times 100$$

= 52.41 or 52% approx
(It is irrelevant whether profit is ascertained on the whole transaction or per unit)

24. (a) $$\text{Profit\%} = \frac{2006 - 1700}{1700} \times 100$$

= 18%

25. (a) $$\text{SP} = \text{CP} \times \frac{(100 + \text{P\%})}{100}$$

$$= 160 \times \frac{115}{100} = 184$$

26. (a) $$\text{CP} = \text{SP} \times \frac{100}{100 + \text{P\%}}$$

$$= 8750 \times \frac{100}{125} = 7000$$

$$\text{MP} = \text{CP} \times \frac{100}{100 - 0\%}$$

$$= 7000 \times \frac{100}{100 - 30\%} = 7000 \times \frac{100}{70} = 10{,}000$$

27. (c) $$\text{SP} = \text{CP} \frac{(100 + \text{P\%})}{100}$$

$$= 150 \times \frac{120}{100} = 180$$

28. (a) Min. C.P = ₹150
Max. SP = ₹350
Profit = 350 – 150 = 200
Profit on 15 books = 200 × 15 = 3000

29. (d) $$\text{Percentage loss} = \frac{(\text{Percentge})^2}{100}$$

$$= \frac{(25)^2}{100} = \frac{625}{100} = 6.25\%$$

30. (c) Suppose original price is ₹100
A pays ₹95 for it
He sellls it for (95 × 120%) = 114

$$\text{Profit\%} = \frac{14}{100} \times 100 = 14\%$$

31. (d) $$\text{Profit\%} \frac{\text{Commission on MP}}{100 - \text{Commission}} \times 100$$

$$= \frac{25}{100 - 25} \times 100 = 33\frac{1}{3}\%$$

32. (a) $$320\left(1 - \frac{10}{100}\right)\left(1 - \frac{D_2}{100}\right) = 244.80$$

$$288\times\left(1-\frac{D_2}{100}\right)=244.80$$

$$288-\frac{288D_2}{100}=244.80$$

$$\frac{-288D_2}{100}=244.80-288$$

$$\frac{288D_2}{100}=43.2$$

$$D_2=\frac{43.2\times100}{288}=15\%$$

33. (d) $\text{CP for B}=\text{SP}\times\frac{100}{100+P\%}$

$$=462\times\frac{100}{105}=440$$

$$\text{CP for A}=\text{SP}\times\frac{100}{100+P\%}=440\times\frac{100}{110}=400$$

34. (b) $CP = SP - Profit$

$= 56 - x$ .....(1)

$CP = SP + Loss$

$= 42 + x$ .....(2)

$56 - x = 42 + x$

$56 - 42 = x + x$

$14 = 2x,\ x=\frac{14}{2}=7$

$CP = 56 - 7 = 49.$

35. (a) Let the CP be x

$$\text{Loss}=\frac{1}{16}\times x=\frac{x}{16}$$

$SP = CP - Loss$

$$150=x-\frac{x}{16}$$

$$150=\frac{15x}{16}\text{ or }x=\frac{150\times16}{15}$$

$=160$

36. (c) $\text{Perccentage of cost}=\frac{\text{Profit}\%}{100-P\%}\times100$

$$=\frac{25}{100-25}\times100=33\frac{1}{3}\%.$$

37. (a) $15\%\text{ of }x=45$

$$x=\frac{45\times100}{15}$$

$=300$

38. (c) $\text{CP of 1 banana}=\frac{100}{200}=0.05\text{ paisa}$

$$SP=CP\times\frac{100+P\%}{100}$$

$$=0.05\times\frac{125}{100}=0.0625$$

$$\text{In 1 rupee he should sell}=\frac{1}{0.0625}=16\text{ bananas}$$

39. (a) $\text{Profit}\%=\frac{\text{Error}}{1000-\text{Error}}\times100$

$$=\frac{250}{1000-250}\times100$$

$$=33\frac{1}{3}\%$$

40. (a) Let the LP be 100

So, cost price $= 100 \times 70\%$

$= 70$

$SP = 100 \times 160\% = 160$

$Profit = 160 - 70 = 90$

When profit is 90, LP = 100

$$\text{When profit is 81 LP}=\frac{100\times81}{90}=90$$

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