

## Profit, Loss and Discount



### Introduction

The term profit and loss are related to the business and marketing. If a merchant purchases a goods at a certain rate and sells it at the rate higher than the purchase price then he said to have earn profit and if he sells at the price less than the purchase price then he said to have loss.

In this chapter, apart from profit and loss we will also discuss about the tax which we have to pay on the goods we purchase from the market. The tax we pay on the goods we purchase is called as value added tax or VAT. The tax we pay as a vat is the nominal amount on the goods which goes to government funds and used by the government for providing the various facilities to the public such as road, electricity, water, and many other facilities.

The another term we will use in this chapter is discount. Discount is the amount reduced on the marked price of the article by the shopkeeper. The rate of discount is the rate at which the amount is reduced on the marked price. The marked price of the article is the price which is mentioned on the article or on the tag of the article. There is a difference between the mark price and cost price of the article. If  $MP > CP$ , then shopkeeper will have profit on that particular article on the other hand if  $MP < CP$ , then the shopkeeper will have loss on the article. Also if  $SP > CP$ , then it is profit and if  $SP < CP$ , then it is loss.



### Cost Price

The amount at which an article is purchased is called its cost price. It is denoted by C.P.

$$C.P. = S.P. - \text{Profit}$$



### Selling Price

The amount at which an article is sold is called its selling price. It is denoted by S.P.

$$\text{Profit} = S.P. - C.P.$$

$$\text{Profit percent} = \frac{\text{profit}}{C.P.} \times 100$$

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

$$\text{Loss} = C.P. - S.P.$$

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

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



### Market Price

The price mentioned on an article is called market price. It is denoted by M P

$$M.P. = C.P. + \text{Profit}$$

$$\text{Or, } M.P. = S.P. + \text{Discount}$$



### Discount

In order to increase the sale or clear the old stock some time the shopkeepers offer a certain percentage of rebate on the marked price this rebate is known as discount.

$$S.P. = M.P. - \text{Discount}$$

$$\text{Discount}\% = \frac{\text{Discount}}{\text{Markprice}} \times 100$$

$$\text{Discount}\% = \left( \frac{M.P. - S.P.}{M.P.} \right) \times 100$$

## You Must KNOW

- ❖ The objects of mathematical study are continuity, infinity, infinity, infinitesimals and paradoxes.
- ❖ Mathematics studies stability, projections and values.
- ❖ Some numbers in mathematics are squares and other are triangles.
- ❖ Even an uncorking clock shows right time twice in 24 hours.

## SUMMARY

- ❖ The price at which the article is bought is called cost price and the price at which it is sold is called selling price.
- ❖ If the selling price is more than cost price then there is profit and if the selling price is less than the cost price then there is loss.
- ❖ Discount is the relaxation of price given on the mark price of the item.
- ❖ VAT is the tax charged on the mark price of the item when it is sold.

## Commonly Asked

### QUESTIONS



A man went to the market and purchased the different articles, among which he also purchased two freezers. He came to his home and found that there is some defect in one of the freezers and so he decided to sell both of them for Rs. 1500 each. He sold one of the freezers at the gain of 30% and other at the loss of 30%. Find the overall gain or loss on the whole transaction.

- (a) 9.75% (b) 9.98%  
(c) 9.89% (d) 9.57%  
(e) None of these

**Answer: (c)**



A merchant buys two kinds of coffee, one at the rate of Rs. 4000 per quintal and another at the rate of Rs. 1000 per quintal. He mixed them in a proportion of 10 kg and 6 kg respectively. If he wants to have a profit of 40% on the whole transaction, then at what price per quintal he must sell the mixture of the coffee from his outlet.

- (a) Rs. 3500 (b) Rs. 4580  
(c) Rs. 4850 (d) Rs. 5280 (e) None of these

**Answer: (a)**

**Explanation**

Let the quantity of first kind mixed with the second kind be  $10x$  and  $6x$ .

$$\text{Then, C.P. of the mixture} = \left( \frac{8000}{100} \times 10x + \frac{10000}{100} \times 6x \right) = \text{Rs. } 1400x$$

$$\therefore \text{Cost price of 1 kg of the mixture} = \frac{1400x}{16x} = 87.5$$

$$\text{For the gain of 20\%, S.P. of one kg of the mixture} = \frac{40}{100} \times 87.5 = 35$$

S.P. of one quintal of coffee is = Rs. 3500



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The price of the different articles in the market remains varying with the time. Mary went to the Mall and purchased some pulse and milk from there. She purchased 2 kg of pulse and 8 kg of milk for Rs. 900. After one month the price of pulse rose by 20% and that of milk by 100%, so she has to pay Rs. 1040 for the same quantity of the same article she purchased. Find the price per kg of pulse.

- (a) Rs. 172.4                      (b) Rs. 150.6  
(c) Rs. 450.5                      (d) Rs. 285.2  
(e) None of these

**Answer: (a)**

**Explanation**

Let the cost of one kg of pulse be Rs.  $x$  and that of Milk be Rs.  $y$ .  
Then cost of one kg pulse and four kg of milk  $= 2x + 8y = 900$   
After increase in price of pulse and milk the cost will be  $= 1.2x + 12y = 1040$   
On solving the above equation, we get  
 $x = 172.4$ ,  $y = 69.4$



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A shopkeeper buys two packets of dairy milk bar, each having same number of bars. The first packet was purchased at the rate of 30 paise each and second at the rate of 3 for 100 paise. The shopkeeper mixed both of them together and sold them at the rate of Rs. 8.50 per dozen. The shopkeepers gain or loss on whole transaction is:

- (a) 85.25%                      (b) 123.68%  
(c) 120%                      (d) 52.8%  
(e) None of these

**Answer: (b)**



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A dishonest merchant uses a defective weight balance to measure the weight of the article he purchased or sold at his outlet. When he purchases the goods for his outlet he uses to measure 10% less than the usual weight while selling the same goods he uses to measure 10% more than the usual weight. If he sells certain weight of goods to some one, his gain will be:

- (a) 20%                      (b) 23%  
(c) 12%                      (d) 21%  
(e) None of these

**Answer: (d)**

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# Self Evaluation TEST



**Duration  
10 Minutes**

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1. In market business there is a chain relation between manufacturer and consumers. A cloth manufacturing company manufactures shirts and trousers and sells them to the wholesale dealer at a profit of 20%, who in turn sells it to a retailer at a profit of 10%. The retailer sells it to the consumers for the cost of Rs. 850 per pieces and still makes the profit of 25%. The cost price of the article is:
- (a) Rs. 515.15                      (b) Rs. 550.25  
(c) Rs. 415.75                      (d) Rs. 475.25  
(e) None of these
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2. Jack purchases a table for Rs. 4500 through auction. He finds that the dealer pays the auctioneers 10% on the selling price and still makes the profit of 10% on the whole transaction. Find the cost price of the table for the dealer.
- (a) Rs. 3600.5  
(b) Rs. 3681.8  
(c) Rs. 4100.7  
(d) Rs. 3900.3  
(e) None of these
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3. John is a mechanical engineer and deals in purchasing and selling of old scooters and bikes. He uses to purchase the old scooters and bikes and after repairing and service sell them to the customers at certain gain or loss. He purchased an old scooter for Rs. 15000 and spent Rs. 4000 on its repairing and service. Then he sold it to a customer named Martin for Rs. 18000. Find his percent of gain or loss on this transactions.
- (a) 5.45%  
(b) 3.33%  
(c) 5.26%  
(d) 5.35%  
(e) None of these
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4. The goods are available at different rates at different places. The price of same eatables is Rs. 2500 at his places in the same city. Robert came to know that the price of eatables has been reduced by 10% at shoppers mall than the mall near his residence. So he went there to purchase the items and expensed Rs. 50 on the journey and still makes profit. Find his profit percent.
- (a) 8%  
(b) 10%  
(c) 10%  
(d) 15%  
(e) None of these
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5. A landlord has a large piece of agricultural land which he wants to sell. James wants to buy the land and buys it for Rs. 400000. After some time he was in need of money and wanted to sell that land piece. He sells one third of the land at the loss of 20% and two fifth at the gain of 25%. At what price he must sell the remaining land so that he can make the overall profit of 10% on the whole transaction?

(a) Rs.  $\frac{80000}{3}$   
(b) Rs.  $\frac{400000}{3}$   
(c) Rs.  $\frac{320000}{3}$   
(d) Rs.  $\frac{920000}{3}$   
(e) None of these

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6. If the cost price of 20 greeting cards is equal to the selling price of 16 greeting cards, find the gain or loss percent.

(a) 20%  
(b) 25%  
(c) 30%  
(d) 40%  
(e) None of these

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7. William buys a geyser for certain price but due to some defect he decides to sell the geyser and so he reduces the selling price of the geyser by Rs. 100 and sells it to the one of the customers. When he calculates the overall transaction he finds that his expected gain of 10% turns into the loss of 10%. What was the original selling price of the geyser?

(a) Rs. 1100  
(b) Rs. 696  
(c) Rs. 469  
(d) Rs. 1125  
(e) None of these

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8. A dealer deals in electronics items and many other machinery products. Robert went to the electronic shop and purchased an electric fan for Rs. 1140 after getting a discount of 5% on the marked price of the fan. The mark price of the fan was:

(a) Rs. 1200  
(b) Rs. 1275  
(c) Rs. 1375  
(d) Rs. 1475  
(e) None of these

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9. Maria goes to purchase some cloths for her and her daughter from the mall. The shopkeeper allows her the successive discount of 30% and 20% on the suit she purchases for herself. Find the single discount equivalent to these successive discounts on her suit.
- (a) 30%
  - (b) 28%
  - (c) 32%
  - (d) 35%
  - (e) None of these
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10. Jacob is a merchant who deals with the handicraft made up of woods and export it to other countries. He used to purchase the item from the local vendors and transport it to other countries. If he buys the item at 32% off the list price and wants to make the profit of 25% after allowing a discount of 20% to the retailers. At what percent above the list price should he mark the mark price of the item?
- (a) 6.25%
  - (b) 14%
  - (c) 7.30%
  - (d) 8.260%
  - (e) None of these
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**Answers – Self Evaluation Test**

1.	A	2.	B	3.	C	4.	A	5.	B	6.	B	7.	D	8.	A	9.	B	10.	A
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# Self Evaluation Test

## SOLUTIONS

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2. The selling price of the table for the dealer = Rs. 4500.  
Amount paid to the auctioneer = 10% of 4500  
= Rs. 450.  
Net money received by the dealer = Rs. (4500 - 450) = Rs. 4050  
The gain percent of the dealer = 10%.  
 $\therefore$  Cost price for the dealer =  $\frac{100}{110} \times 4050 = \text{Rs. } 3681.8$
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3. Cost Price of the scooter = Rs. 15000.  
Cost price after repairing and service = Rs. (15000 + 4000) = Rs. 19000  
Selling price of scooter = Rs. 18000  
Loss on whole transaction = Rs. (19000 - 18000) = Rs. 1000  
 $\text{Loss\%} = \left( \frac{\text{Loss}}{\text{CP}} \times 100 \right) = \left( \frac{1000}{19000} \right) \times 100 = 5.26\%$
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4. C.P. = Rs. 2500  
Reduction = 10% of 2500 = Rs. 250  
Price at the new mall = Rs. 2500 - 250 + 50 = Rs. 2300  
Gain = Rs. (2500 - 2300) = Rs. 200  
 $\% \text{gain} = \left( \frac{200}{2500} \right) \times 100 = 8\%$
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5. Cost Price of entire land = Rs. 400000.  
Proposed profit on the whole land = 10% of 400000 = Rs. 40000.  
Proposed selling price of whole land = Rs. 440000.  
Cost price of one third land = Rs.  $\frac{400000}{3}$   
Lose on that land = 20% of Rs.  $\frac{400000}{3} = \text{Rs. } \frac{800000}{3}$   
Selling price of that land =  $\frac{400000}{3} - \frac{800000}{3} =$   
 $\text{Rs. } \frac{320000}{3}$   
Cost price of two fifth of the land =  $\frac{2}{5} \times 400000 = \text{Rs. } 160000$ .  
Gain on the transaction = 25% of 160000 = Rs. 40000.  
Selling price of that land = Rs. (160000 + 40000) = Rs. 200000,

$$\text{Total selling price of the land} = \frac{320000}{3} + 200000 = \text{Rs. } \frac{920000}{3}$$

Selling price of the remaining land

$$= \text{Rs.} \left( 440000 - \frac{920000}{3} \right) = \text{Rs. } \frac{400000}{3}$$


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6. Let cost price of each card be Rs.  $x$ .  
 Then C. P. of 16 greeting cards = Rs.  $16x$ .  
 S. P. of 16 greeting cards = C.P. of 20 cards = Rs.  $20x$ .  
 Therefore, gain = S.P. - C.P. = Rs.  $(20 - 16)x = \text{Rs. } 4x$ .

$$\% \text{ gain} = \frac{4x}{16x} \times 100 = 25\%$$


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7. Let the original selling price of the geyser be Rs.  $y$   
 Since there is a gain of 10% on the original selling price, therefore, the cost price of the geyser,

$$C.P. = \left( \frac{100}{100+10} \right) y = \frac{100}{110} y = \frac{10}{11} y$$

When the selling price of the geyser is reduced by Rs. 50, there is loss of 10%.

$$\therefore C.P. = \left( \frac{100}{100+10} \right) \times (y - 100) = \text{Rs. } \frac{100}{90} (y - 100) \quad \frac{10}{9} (y - 100)$$

$$y = \text{Rs. } 1100$$


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9. Let market price of an article be Rs. 100  
 Then discount on it = Rs. 30.  
 Price after discount = Rs.  $(100 - 30) = \text{Rs. } 70$ .  
 2nd discount on it = 20 % of Rs. 70 = Rs. 14  
 Price after 2nd discount = Rs. 66.  
 Single discount equivalent to given successive discounts =  $(100 - 66)\% = 34\%$ .
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