CHAPTER 2

Profit, Loss and Discount

2.1 Formulae

(i) **Profit = SP – CP**

(ii) **Loss = CP – SP**

(iii) $\textbf{Profit \%} = \frac{\textbf{Profit}}{\textbf{CP}} \times 100\% = \frac{\textbf{SP} - \textbf{CP}}{\textbf{CP}} \times 100\%$

(iv) $\textbf{Loss \%} = \frac{\textbf{Loss}}{\textbf{CP}} \times 100\% = \frac{\textbf{CP} - \textbf{SP}}{\textbf{CP}} \times 100\%$

(v) $\textbf{CP} = \frac{\textbf{SP} \times 100}{(100 + \textbf{P\%})} = \frac{\textbf{SP} \times 100}{(100 - \textbf{L\%})}$

(vi) $\textbf{SP} = \frac{\textbf{CP}(100 + \textbf{P\%})}{100} = \frac{\textbf{CP}(100 - \textbf{L\%})}{100}$

NUMERICAL CHALLENGE 2.1

1. The cost price of a shirt is Rs.200 and selling price Rs.250. Calculate the % profit.

Solution

We have C.P. = Rs 200, S.P. = Rs. 250.

Profit = S.P. – C.P. = 250 – 200 = Rs.50.

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

$$= \frac{50 \times 100}{200} = 25\%$$

2. Anu bought a necklace for Rs.750 and sold it for Rs.675. Find her percentage loss.

Solution

Here C.P. = Rs.750, S.P. = Rs.675.

Loss = C.P. – S.P. = 750 – 675 = Rs.75.

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

$$= \frac{75 \times 100}{750} = 10\%$$

3. Mr. Sharma buys a cooler for Rs.4500. For how much should he sell so that there is a gain of 8%?

Solution

We have C.P. = Rs.4500, gain% = 8%.

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

$$= \left(\frac{100 + 8}{100}\right) \times 4500$$

$$= \frac{108}{100} \times 4500$$

$$= \text{Rs.}4860.$$

4. By selling a fridge for Rs.7200, Pankaj loses 10%. Find the cost price of the fridge.

Solution

We have, S.P. = Rs.7200, gain% = 10%.

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

$$= \left(\frac{100}{100 - 10}\right) \times 7200$$

$$= \frac{100}{90} \times 7200$$

$$= \text{Rs.}8000.$$

5. By selling a pen for Rs.99, Mohan gains $12\frac{1}{2}\%$. Find the cost price of the pen.

Solution

We have, S.P. = Rs.99, gain% = $12\frac{1}{2}\%$.

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

$$= \left(\frac{100}{100 + \frac{25}{2}}\right) \times 99$$

$$= \left(\frac{100 \times 2}{225}\right) \times 99$$

$$= \text{Rs.}88.$$

2.2

(i) **Marked price = CP + Markup**

(ii) **Marked price = CP + (% markup on CP)**

Note : Generally goods are sold at marked price, if there is no longer discount, then in this case selling price equals to marked price.

Discount : Discount means reduction of marked price is sell at a lower rate or literally discount means concession. It is calculated on the basis of marked price.

(iii) **Selling price = Marked price – Discount**

(iv) **Selling price = Marked price (MP) – (% discount on MP)**

Since marked price = CP + % markup on CP

Remember mark up is calculated on the basis of CP while discount is calculated on the basis of MP.

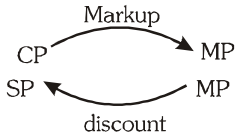
In general, **CP < SP < MP** **at profit**

CP = SP < MP **at no profit no loss**

SP < CP < MP **at loss**

Also

and



NUMERICAL CHALLENGE 2.2

1. If the cost price of an article is Rs. 300 and the per markup is 20%. What is the marked price?

Solution

MP = CP + % markup on CP

$$= 300 + 300 \times \left(\frac{20}{100}\right)$$

MP = Rs. 360

Alternatively : SP = 300 × 1.2 = 360

2. If the marked price of an article is Rs. 450 and markup percentage is 12.5%, what is the cost price?

Solution

MP = 112.5 of CP

$$450 = \frac{112.5}{100} \times CP$$

$$450 = \frac{9}{8} \times CP$$

CP = Rs. 400

3. If the marked price of an article is Rs. 660 and the discount percent is 10%, then what is the selling price of the article?

Solution

SP = MP – Discount

$$SP = 660 - 660 \times \frac{10}{100}$$

$$SP = 594$$

Alternatively: SP = 90% of MP

$$SP = 0.9 \times 660$$

$$SP = 594$$

Alternatively: We can see that when SP is 10% (i.e., $\frac{1}{10}$) less than MP, it means MP is $\frac{1}{9}$ times greater than SP.

Therefore $MP = \frac{10}{9} SP \qquad \left(1 + \frac{1}{9} = \frac{10}{9}\right)$

2.3

An article sold at selling price (SP_1) at a loss x% is to be sold at selling price (SP_2) to gain y%, then

$$\mathbf{SP_2 = \frac{SP_1(100 + Y)}{(100 - x)}}$$

NUMERICAL CHALLENGE 2.3

By selling a radio for Rs.1536, Suresh lost 20%. What percent shall he gain or lose by selling it for Rs.2000?

Solution

Here $S.P_1 = 1536$, $x = -20$ (–ve sign indicates loss)

$S.P_2$ = Rs.2000, $y = ?$

Using the formula,

$$\frac{SP_1}{100 + x} = \frac{SP_2}{100 + y}$$

we get, $$\frac{1536}{100 - 20} = \frac{2000}{100 + y}$$

$$\Rightarrow \quad 100 + y = \frac{2000 \times 80}{1536} = 104\frac{1}{6}$$

$$\Rightarrow \quad y = 4\frac{1}{6}\%.$$

Thus, Suresh has a gain of $4\frac{1}{6}$ % by selling it for Rs. 2000.

2.4

If SP of x article = CP of y articles, then Gain % = $\frac{y - x}{x} \times 100\%$. [If x < y it is gain, if x > y it is loss.]

NUMERICAL CHALLENGE 2.4

1. If the S.P. of 12 article is equal to the cost price of 18 articles what is profit% ?

Solution

Here m = 18, n = 12

$$\text{Profit \%} = \frac{(m-n)}{n} \times 100$$

$$= \frac{18-12}{12} \times 100 = \frac{6}{12} \times 100 = 50\%.$$

2. If the S.P. of a dozen apple is equal to cost price of 9 apples, find gain or loss%?

Solution

Here m = 9, n = 12

$$\text{Profit \%} = \left(\frac{m-n}{n}\right) \times 100 = \frac{9-12}{12} \times 100$$

$$= \frac{1}{4} \times 100 = -25\%$$ (–ve) sign indicates loss.

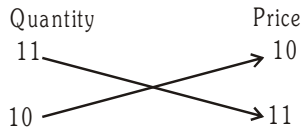
2.5

If a man buys x items for Rs.y and sells z items for Rs.w, then the gain of loss percent made by him is $\left(\frac{xw}{zy} - 1\right) \times 100\%$

NUMERICAL CHALLENGE 2.5

1. If 11 oranges are bought for Rs.10 and sold at 10 for Rs.11, what is the gain or loss%?

Solution



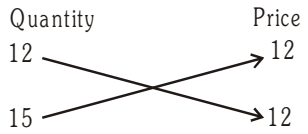
$$\text{\% profit} = \left(\frac{xw}{zy} - 1\right) \times 100\%$$

$$= \left(\frac{11 \times 11}{10 \times 10} - 1\right) \times 100\%$$

$$= \frac{21}{100} \times 100\% = 21\%.$$

2. A fruit seller buys apples at the rate of Rs.12 per dozen and sells them at the rate of 15 for Rs.12. Find his percentage gain or loss.

Solution



$$\% \text{ profit} = \left(\frac{xw}{zy} - 1\right) \times 100\%$$

$$= \left(\frac{12 \times 12}{15 \times 12} - 1\right) \times 100\%$$

$$= \frac{36}{180} \times 100\% = -20\%.$$

Since the sign is –ve, there is a loss of 20%

2.6

If 'A' sells an article to 'B' at a gain/loss of m% and 'B' sells it to 'C' at a gain/loss of n%. If 'C' pays Rs.z for it to 'B' then the cost price for 'A' is

$$\left[\frac{\mathbf{100^2 z}}{\mathbf{(100+m)\,(100+n)}}\right]$$

where m or n is –ve, of it indicates a loss, otherwise it is +ve.

NUMERICAL CHALLENGE 2.6

1. Mohit sells a bicycle to Rohit at a gain of 10% and Rohit again sells it to Jyoti at a profit of 5%. If Jyoti pays Rs.462 to Rohit, what is the cost price of the bicycle for Mohit?

Solution

Here m = 10, n = 5, z =Rs. 462.

Using the formula,

$$\text{C.P.} = \left[\frac{100^2 z}{(100+m)\,(100+n)}\right],$$

$$\text{we get, C.P. for Mohit} = \left[\frac{100^2 \times 462}{(100+10)\,(100+5)}\right]$$

$$= \frac{462 \times 10000}{110 \times 105} = \text{Rs.}400.$$

2. 'A' sells a DVD to 'B' at a gain of 17% and 'B' again sells it to 'C' at a loss of 25%. If 'C' pay Rs. 1053 to 'B', what is the cost price of the DVD to 'A'?

Solution

We have, m = 17, n = –25, z = Rs.1053.

∴ Cost price of DVD to 'A'

$$= \left[\frac{100^2 z}{(100+m)(100+n)}\right]$$

$$= \frac{100\times100\times1053}{(100+17)(100-25)}$$

$$= \frac{100\times100\times1053}{117\times75} = \text{Rs. } 1200.$$

2.7

If 'A' sells an article to 'B' at a gain/loss of m% and 'B' sells it to 'C' at a gain/loss of n%, then the resultant profit/loss percent is given by

$$\left(\mathbf{m+n+\frac{mn}{100}}\right) \qquad \text{....(1)}$$

where m or n is –ve, if it indicates a loss, otherwise it is +ve.

Note: The expression given by (1) represents resultant profit of loss accordingly as it is +ve of –ve.

NUMERICAL CHALLENGE 2.7

Manoj sells s shirt to Yogesh at a profit of 15% and Yogesh sells it to Suresh at a loss of 10%. Find the resultant profit or loss.

Solution

Here m = 15, n = –10

Resultant profit/loss% $= \left(m+n+\frac{mn}{100}\right)$

$$= \left(15-10+\frac{15x-10}{100}\right)$$

$$= \left(15-10+\frac{150}{100}\right)$$

$$= \frac{7}{2}\% \text{ or } 3\frac{1}{2}\%.$$

2.8

When two different articles are sold at the same selling price, getting gain/loss of x% on the first and gain/loss of y% on the second, then the overall% gain or % loss in the transaction is given by

$$\left[\frac{\mathbf{100(x+y)+2xy}}{\mathbf{(100+x)+(100+y)}}\right]\%$$

The above expression represent overall gain or loss accordingly as its sign is +ve or –ve.

NUMERICAL CHALLENGE 2.8

Mahesh sold two scooters, each for Rs.24000. If he makes 20% profit on the first and 15% loss on the second, what is his gain of loss per cent in the transaction?

Solution

Here x = 20 and y = –15.

∴ Over all gain/loss%

$$= \left[\frac{100(x+y)+2xy}{(100+x)+(100+y)}\right]\%$$

$$= \left[\frac{100(20-15)+2\times 20\times -15}{(100+20)+(100-15)}\right]\%$$

$$= \frac{-100}{205}\% = -\frac{20}{41}\%$$

which represents loss, being a –ve expression.

2.9

When two different articles are sold at the same selling price getting a gain of x% on the first and loss of x% on the second, then the overall% loss in the transaction is given by

$$\left(\frac{x}{10}\right)^2 \%.$$

Note that in such questions there is always a loss.

NUMERICAL CHALLENGE 2.9

Rajesh sold two horses for Rs.990 each; gaining 10% on the and losing 10% on the other. Find his total gain or loss per cent.

Solution

Here x = 10.

$$\therefore \quad \text{Overall loss\%} = \left(\frac{x}{10}\right)^2 \%$$

$$= \left(\frac{10}{10}\right)^2 \% = 1\%.$$

2.10

A mechant uses faculty measure and sells his goods at gain/loss of x%. The overall % gain/loss(g) is given by

$$\frac{100+g}{100+x} = \frac{\text{True measure}}{\text{Faulty measure}}$$

Note: If the merchant sells his goods at cost price, then x = 0.

NUMERICAL CHALLENGE 2.10

1. A dishonest shopkeeper professes to sell cloth at the cost price but he uses faulty metre rod. His metre rod measures 95 cm only. Find his gain per cent.

Solution

Here True measure = 100 cm

False measure = 95 cm.

Since the shopkeeper sells the cloth at cost price,

$\therefore \quad x = 0.$

$\therefore$ Over all gain% is given by

$$\frac{100+g}{100+x} = \frac{\text{True measure}}{\text{Faulty measure}}$$

$$\Rightarrow \quad \frac{100+g}{100} = \frac{100}{95}$$

$$\Rightarrow \quad 100 + g = \frac{100\times 100}{95}$$

$$\Rightarrow \quad g = \frac{10000}{95} - 100$$

$$= 5\frac{5}{19}\%.$$

2. A dishonest shopkeeper professes to sell goods at the cost price but he the uses a weight of 800g for the kg weight. Find his gain per cent.

Solution

True measure = 1000 g

False measure = 800g

Also, $x = 0.$

$\therefore$ Over all gain% is given by

$$\frac{100+g}{100+x} = \frac{\text{True measure}}{\text{Faulty measure}}$$

$$\Rightarrow \quad \frac{100+g}{100} = \frac{1000}{800}$$

$$\Rightarrow \quad 100 + g = \frac{1000\times 100}{800}$$

$$\Rightarrow \quad g = \frac{1000}{8} - 100 = 25\%.$$

2.11

A merchant uses y% less weight/length and sells his goods at gain/loss of x%. The overall % gain/loss in given by

$$\left[\left(\frac{y+x}{100-y}\right)\times 100\right]\%.$$

NUMERICAL CHALLENGE 2.11

A shopkeeper sells the goods at 44% loss on cost but uses 30% less weight. What is his percentage profit or loss?

Solution

Here x = –44 and y = 30.

$$\therefore \quad \text{Over all gain/loss\%} = \left(\frac{y + x}{100 - y}\right) \times 100\%$$

$$= \left(\frac{30 - 44}{100 - 30} \times 100\right)\%$$

$$= \left(\frac{-14}{70} \times 100\right)\% = -20\%,$$

which represents loss being a negative expression.

2.12

A person buys two items for Rs.A and sells one at a loss of ℓ % and other at a gain of g %. If each item was sold at the same price, then

(a) The cost price of the item sold at loss

$$= \frac{\mathbf{A(100 + \%\,gain)}}{\mathbf{(100 - \%\,loss) + (100 + \%\,gain)}}$$

(b) The cost price of the item sold at gain

$$= \frac{\mathbf{A(100 - \%\,loss)}}{\mathbf{(100 - \%\,loss) + (100 + \%\,gain)}}$$

NUMERICAL CHALLENGE 2.12

Ramesh buys two books for Rs.410 and sells one at a loss of 20% and the other at a gain of 25%. If both the books are sold the same, find the cost price of two books.

Solution:

Cost price of the books sold at a loss of 20%

$$= \frac{410(100 + 25)}{(100 - 20) + (100 + 25)}$$

$$= \frac{410 \times 125}{80 + 125} = \text{Rs. } 250.$$

Cost price of the book sold at a profit of 25%

$$= \frac{410(100 - 25)}{(100 - 20) + (100 + 25)} = \frac{410 \times 80}{80 + 125}$$

$$= \text{Rs. } 160.$$

2.13

If two successive discounts on an article are m% and n%, respectively, then a single discount equivalent to the two successive discount will be

$$\left(m+n-\frac{mn}{100}\right)\%.$$

NUMERICAL CHALLENGE 2.13

1. Find a single discount equivalent to two successive discount of 10% and 20%.

Solution:

The equivalent single discount is given by

$$\left(10+20-\frac{10\times 20}{100}\right)\% \text{ i.e., } 28\%.$$

2. Two shopkeepers sell machines at the same list price. The first allows two successive discounts of 30% and 16% and the second 20% and 26%. Which discount series is more advantageous to the purchaser?

Solution:

A single discount equivalent to the two successive discounts of 30% and 16% is $\left(30+16-\frac{30\times 16}{100}\right)\%$

or, $\left(46-\frac{24}{5}\right)\%$ or $41\frac{1}{5}\%$

Also, a single discount equivalent to the two successive discount of 20% and 26% is $\left(20+26-\frac{20\times 26}{100}\right)\%$

or, $\left(46-\frac{26}{5}\right)\%$ or $40\frac{4}{5}$.

Clearly, the discount series being offered by the first shopkeeper is more advantageous to the purchaser.

2.14

If three successive discount on an article are l%, m% and n% respectively, then a single discount equivalent to the three successive discounts will be

$$\left[l+m+n-\frac{(lm+ln+mn)}{100}+\frac{lmn}{100^2}\right]\%$$

NUMERICAL CHALLENGE 2.14

Find a single discount equivalent to three successive discounts of 10%, 20% and 30%.

Solution:

The equivalent single discount is given by

$$\left(10+20+30-\frac{(10\times 20+10\times 30+20\times 30)}{100}+\frac{10\times 20\times 30}{100^2}\right)\%$$

i.e., $\left(60-11+\frac{6}{10}\right)\% = \frac{496}{10}\%$ or 49.6%.

2.15

A shopkeeper sells an item at Rs.z after giving a discount of d% on labelled price. Had he not given the discount, he would have earned a profit of p% on the cost price.

The cost price of each item is given by

$$\textbf{C.P.} = \left[\frac{\mathbf{100^2 z}}{\mathbf{(100 - d)(100 + p)}}\right].$$

NUMERICAL CHALLENGE 2.15

Two shopkeepers sold sarees at Rs. 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?

Solution:

We have, labelled price z = Rs.266, discount d = 5% and profit p = 12%.

Using the formula

$$\text{C.P.} = \left[\frac{100^2 z}{(100 - d)(100 + p)}\right]$$

we get the cost price of each saree

$$= \left[\frac{100 \times 100 \times 266}{(100 - 5)(100 + 12)}\right]$$

$$= \frac{100 \times 100 \times 266}{95 \times 112} = \text{Rs.}250.$$

1. Two successive discount of 10% and 20% equal to a single discount of

(1) 10% (2) 28%

(3) 40% (4) 30%

Sol. $\left(10+20-\frac{10\times 20}{100}\right) = 28\%$

Which is less than 30%.

2. Find the single discount which is equal to three successive discount of 10%, 20% and 30%.

Sol. Here first of all we will determine single discount, which is equal to two successive discounts of 10% and 20%.

$$10 + 20 - \left(\frac{10\times 20}{100}\right)\% = 20\%$$

Now we will find a single discount which is equal to two successive discounts of 28% and 30% =

$$\left(28+30-\frac{28\times 30}{100}\right)\% = 49.6\%$$

3. By selling a watch for Rs. 495, a shopkeeper incures a loss of 10%. Find the cost price of the watch for the shopkeeper.

(1) Rs. 545 (2) Rs. 550

(3) Rs. 555 (4) None of these

Sol. Here S.P. = 495

Loss = 10%

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

$$\text{CP} = \frac{495}{90}\times 100 = 550 \text{ Rs.}$$

4. By selling a cap for Rs. 34.40, a man gains 7.5% percent. What will be the CP of the cap?

(1) Rs. 32.80 (2) Rs. 32

(3) Rs. 32.40 (4) Rs. 28.80

Sol. $\text{C.P.} = \frac{\text{SP}}{(100+\text{Gain}\%)}\times 100$

$$\Rightarrow \quad \frac{34.40}{107.5}\times 100 = 32$$

5. A shopkeeper sold goods for Rs. 2400 and made a profit of 25% in the process. Find his profit percent if he had sold his goods for Rs. 2040.

(1) 6.25% (2) 7%

(3) 6.20% (4) 6.5%

Sol. SP = 2400, Profit% = 25

$$\text{C.P.} = \frac{\text{SP}}{(100+\text{P}\%)}\times 100 = \frac{2400}{125}\times 100 = 1920$$

If sold at 2040, profit = 120 Rs.

$$\text{Profit }\% \Rightarrow \frac{120}{1920}\times 100 = 6.25$$

6. The cost price of a shirt and trouser is Rs. 371. If the shirt costs 12% more than the trousers, find the cost price of the trouser.

(1) Rs. 125 (2) Rs. 150

(3) Rs. 175 (4) Rs. 200

Sol. Let CP of trouser be x Rs.

Now CP of shirt = $\frac{112x}{100}$ Rs.

According to given condition

$$x + \frac{112x}{100} = 371, \ \frac{212}{100}x = 371,$$

x = 175 Rs.

7. How much percent more than the cost price should a shopkeeper mark his goods, so that after allowing a discount of 12.5% he should have a gain of 5% on his outlay?

(1) 9.375 (2) 16.66%

(3) 20% (4) 25%

Sol. Let the cost price be x Rs. and printed price be y Rs. Hence, price after giving a discount of 12.5%

$$= y - y\times\frac{12.5}{100}$$

$$\text{Given, } = y - y\times\frac{12.5}{100} = x + x\times\frac{5}{100}$$

$$\Rightarrow y\times\frac{87.5}{100} = x\times\frac{105}{100}$$

$$\therefore y = \frac{105}{87.5}x \Rightarrow y - x = \frac{105}{87.5}x - x = \frac{17.5}{87.5}x$$

Required Percentage

$$= \frac{y-x}{x}\times 100 = \frac{17.5}{87.5}\times 100 = 20\%$$

8. In order to maintain the price line, a trader allows a discount of 10% on the marked price of goods in his shop. However, he still makes a gross profit of 17% on the cost price. Find the profit percent he would have made on the selling price had he sold at the marked price.

(1) 23.07 (2) 30%

(3) 21.21% (4) 25%

Sol. Let the cost price be x Rs. and marked price be y Rs.

$$\text{Given, } y - y \times \frac{10}{100} = x + x \times \frac{17}{100}$$

$$\Rightarrow y \times \frac{90}{100} = x \times \frac{117}{100} \Rightarrow y = \frac{117}{90}x$$

$$\therefore \quad y - x = \frac{27}{90}x$$

$\therefore$ Required Percentage

$$= \frac{y-x}{x} \times 100 = \frac{27}{90} \times 100 = 30\%$$

9. A owns a house worth Rs. 10,000. He sells it to B at a profit of 15%. After some time, B sells it back to A 15% loss. Find A's loss or gain percent.

(1) 2.25% gain (2) 6.25% gain

(3) 17.65% gain (4) 17.25% gain

Sol. Buying price of the House by B

$$= 10000 + 10000 \times \frac{15}{100} = 11500 \text{ Rs.}$$

Price at which A buys house from B.

$$= 11500 - 11500 \times \frac{15}{100} = 11500 - 1725$$

$$= 9775 \text{ Rs.}$$

Hence A's gain percent

$$= \frac{11500 - 9775}{10000} \times 100 = 17.25\%$$

10. A reduction of 10% in the price of sugar enables a housewife to by 6.2 kg more for Rs. 279. Find the reduced price per kilogram.

(1) Rs.5 (2) Rs. 4.5 (3) Rs.4.05 (4) None

Sol. Let original rate = Rs. x per kg

New rate = 90% of x

$$x = \text{Rs.}\left(\frac{90}{100}x\right) = \text{Rs.}\frac{9x}{10}$$

$$\text{Original quantity for Rs. 279} = \frac{279}{x}$$

$$\text{New quantity} = 279 \times \frac{10}{9x} = \frac{310}{x}$$

$$\therefore \frac{310}{x} - \frac{279}{x} = 6.2 \Rightarrow \frac{31}{x} = 6.2$$

$$\Rightarrow x = \frac{31}{6.2} = 5$$

$$\therefore \text{ Reduced Price} = \frac{9 \times 5}{10} = \text{Rs.}4.5 \text{ per kg}$$

11. A man sells an articles at 5% above its price. If he had bought it at 5% less what he paid for it and sold it for Rs. 2 he would have gain/loss 10%. Find the cost of the article.

(1) Rs. 500 (2) Rs. 360

(3) Rs. 425 (4) Rs. 400

Sol. Let the cost price of the article = x Rs.

Price when it is bought at 5% less than cost price

$$= x - x \times \frac{5}{100} = \frac{95}{100}x$$

Selling price when is sold for Rs. 2 less.

$$= x + x \times \frac{5}{100} - 2 = \frac{105}{100}x - 2$$

$$\text{Given, } \frac{105}{100}x - 2 - \frac{95}{100}x = \frac{95}{100}x \times \frac{10}{100}$$

$$\Rightarrow \quad \frac{10}{100}x - 2 = \frac{95}{1000}x$$

$$\therefore \quad x = \frac{2 \times 1000}{5} = 400 \text{ Rs.}$$

12. A briefcase was sold at a profit of 10%. If its cost price was 5% less and it was sold for Rs. 7 more, the gain would have been 20%. Find the cost price of the briefcase.

(1) Rs. 175 (2) Rs. 200

(3) Rs. 225 (4) Rs. 160

Sol. Let the cost price = x Rs.

$$\text{Price 5\% less than cost price} = \frac{95}{100}x$$

$$\text{Selling price when sold for Rs. 7 more} = \frac{110}{100}x + 7$$

$$\text{Given, } \frac{110}{100}x + 7 - \frac{95}{100}x = \frac{95}{100}x \times \frac{20}{100}$$

$$\Rightarrow \frac{20}{500}x = 7 \therefore x = \frac{7 \times 500}{20} = 175 \text{ Rs.}$$

13. A man sells a plot of land at 6% profit. If he had sold it at 10% profit, he would have received Rs. 200 more. What is the selling price of the land?

(1) Rs. 5000 (2) Rs. 5300

(3) Rs. 4800 (4) Rs. 5500

Sol. Let the cost price of land = xRs.

$$\text{Given, } x + x \times \frac{10}{100} = x + x\frac{6}{100} + 200$$

$$\Rightarrow \quad x + \frac{4x}{100} = 200$$

$$\Rightarrow \quad x = \frac{100 \times 200}{4} = 5000 \text{ Rs.}$$

Selling price of land

$$5000 + 50000 \times \frac{6}{100} = 5300 \text{ Rs.}$$

14. A man buys two cycles for a total cost of Rs. 900. By selling one for 4/5 of its cost and other for 5/4 of its cost, he makes a profit of Rs. 90 on the whole transaction. Find the cost price of lower priced cycle.

(1) Rs. 360 (2) Rs. 250

(3) Rs. 300 (4) Rs. 420

Sol. Let the cost of the two cycles be x and y Rs.

Then, $x + y = 900$ ...(i)

$$\text{Again, } \frac{4x}{5} + \frac{5y}{4} - 900 = 90$$

$$\Rightarrow \frac{4x}{5} + \frac{5y}{4} = 990 \quad \text{...(ii)}$$

Solving (i) & (ii), we get

$x = 300$, $y = 600$.

15. A dishonest dealer professes to sell at cost price but uses a 900 gram weight instead of a 1 kilogram weight. Find the percent profit to the dealer.

(1) 10% (2) 11.11%

(3) 12.5% (4) None of these

Sol. Let the cost price be x Rs. per kg.

$$\text{Then cost price of 900 gm} = \frac{9}{10}x$$

Hence % profit

$$\frac{x - \frac{9}{10}x}{\frac{9}{10}x} \times 100 = \frac{100}{9}\% = 11.11\%\%$$

1. 1 gain 70 paise on Rs. 70. My gain percent is
(1) 0.1% (2) 1% (3) 7% (4) 10%

2. A shopkeeper sold an article for Rs. 2090.42. Approximately, what will be the percentage profit if he sold that article for Rs. 2602.58 ?
(1) 15% (2) 20% (3) 25% (4) 30%

3. Jacob bought a scooter for a certain sum of money. He spent 10% of the cost on repairs and sold the scooter for a profit of Rs. 1100. How much did he spend on repairs if he made a profit of 20% ?
(1) Rs. 400 (2) Rs. 440
(3) Rs. 500 (4) Rs. 550

4. A property dealer sells a house for Rs. 6,30,000 and in the bargain makes a profit of 5%. Had he sold it for Rs. 5,00,000, then what percentage of loss or gain he would have made?
(1) $2\frac{1}{4}\%$ gain (2) 10% loss
(3) $12\frac{1}{2}\%$ loss (4) $16\frac{1}{3}\%$ loss

5. The ratio of the cost price and the selling price is 4 : 5. The profit percent is :
(1) 10% (2) 20% (3) 25% (4) 30%

6. If selling price is doubled, the profit triples. Find the profit percent :
(1) $66\frac{2}{3}\%$ (2) 100%
(3) $105\frac{1}{3}\%$ (4) 120%

7. The profit earned by selling an article for Rs. 900 is double the loss incurred when the same article is sold for Rs. 450. At what price should the article be sold to make 25% profit?
(1) Rs. 600 (2) Rs. 750
(3) Rs. 800 (4) Data inadequate

8. If the cost price of 12 pens is equal to the selling price of 8 pens, the gain percent is :
(1) 25% (2) $33\frac{1}{3}\%$
(3) 50% (4) $66\frac{2}{3}\%$

9. A man sold 18 cots for Rs. 16800, gaining thereby the cost price of 3 cots. The cost price of a cot is
(1) Rs. 650 (2) Rs. 700
(3) Rs. 750 (4) Rs. 800

10. A man buys 2 dozen bananas at Rs. 16 per dozen. After selling 18 bananas at the rate of Rs. 12 per dozen, the shopkeeper reduced the rate to Rs. 4 per dozen. The percent loss is :
(1) 25.2% (2) 32.4%
(3) 36.5% (4) 37.5%

11. A man bought some fruits at the rate of 16 for Rs. 24 and sold them at the rate of 8 for Rs. 18. What is the profit percent?
(1) 25% (2) 40% (3) 50% (4) 60%

12. A man buys eggs at 2 for Re. 1 and an equal number at 3 for Rs. 2 and sells the whole at 5 for Rs. 3. His gain or loss percent is :
(1) $2\frac{2}{7}\%$ loss (2) $3\frac{6}{7}\%$ gain
(3) $3\frac{2}{7}\%$ loss (4) $2\frac{6}{7}\%$ gain

13. 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%?
(1) 5 (2) 8 (3) 10 (4) 15

14. Arun purchased 30 kg of wheat at the rate of Rs. 11.50 per kg and 20 kg of wheat at the rate of Rs. 14.25 per kg. He mixed the two and sold the mixture. Approximately what price per kg should he sell the mixture to make 30% profit?
(1) Rs. 14.80 (2) Rs. 15.40
(3) Rs. 16.38 (4) Rs. 18.20

15. A shopkeeper professes to sell his goods at cost price but uses a weight of 800 gm instead of kilogram weight. Thus, he makes a profit of :
(1) 20% (2) $16\frac{2}{3}\%$
(3) 25% (4) None of these

16. A fair price shopkeeper takes 10% profit on his goods. He lost 20% goods during theft. His loss percent is :
(1) 8 (2) 10 (3) 11 (4) 12

17. A house worth Rs. 1,50,000 is sold by X to Y at 5% profit. Y sells the house back to X at 2% loss. Then, in the entire transaction :

(1) X loses Rs. 1350 (2) X gains Rs. 3150
(3) X loses Rs. 4350 (4) X gains Rs. 4350

18. Rahul purchased a scooter at $\frac{13}{15}$ of its selling price and sold it at 12% more than its selling price. His gain is :

(1) 20% (2) $29\frac{3}{13}\%$

(3) 30% (4) $38\frac{1}{13}\%$

19. If 5% more is gained by selling an article for Rs. 350, than by selling it for Rs. 340, the cost of the article is :

(1) Rs. 50 (2) Rs. 160
(3) Rs. 200 (4) Rs. 225

20. The difference between the cost price and sale price of an article is Rs. 240. If the profit is 20%, the selling price is :

(1) Rs. 1240 (2) Rs. 1400
(3) Rs. 1600 (4) None of these

21. A businessman sold $\frac{2}{3}$ of his stock at a gain of 20% and the rest at a gain of 14%. The overall percentage of gain to the businessman is :

(1) 12% (2) 17%
(3) 18% (4) 20%

22. Two-third of a consignment was sold at a profit of 5% and the remainder at a loss of 2%. If the total profit was Rs. 400, the value of the consignment (in Rs.) was

(1) 10,000 (2) 12,000
(3) 15,000 (4) 20,000

23. An article was sold for Rs. y after giving a discount of x%. Then, its list price is :

(1) $\frac{100y}{100-x}$ (2) $\frac{100y}{1-x}$

(3) $\frac{100y}{1-(x/100)}$ (4) None of these

24. Find the selling price of an article if a shopkeeper allows two successive discounts of 5% each on the marked price of Rs. 80.

(1) Rs. 70.10 (2) Rs. 70.20
(3) Rs. 72 (4) Rs. 72.20

25. A tradesman marks his goods 30% above the C.P. If he allows a discount of $6\frac{1}{4}\%$, then his gain percent is :

(1) $21\frac{7}{8}\%$ (2) 22%

(3) $23\frac{3}{4}\%$ (4) None of these

26. At what price should a shopkeeper mark a radio that costs him Rs. 1200 in order that he may offer a discount of 20% on the marked price and still make a profit of 25% ?

(1) Rs. 1675 (2) Rs. 1875
(3) Rs. 1900 (4) Rs. 2025

27. A shopkeeper earns a profit of 12% on selling a book at 10% discount on the printed price. The ratio of the cost price to the printed price of the book is :

(1) 45 : 56 (2) 50 : 61
(3) 55 : 69 (4) 99 : 125

28. A tradesman gives 4% discount on the marked price and gives 1 article free for buying every 15 articles and thus gains 35%. The marked price is above the cost price by :

(1) 20% (2) 39% (3) 40% (4) 50%

29. On selling 17 balls at Rs 720, these is a loss equal to the cost price of 5 balls the cost price of a ball is

(1) Rs.45 (2) Rs. 50
(3) Rs. 55 (4) Rs. 60

30. If a commission of 10% is given on the written price of an article, the gain is 20%. If the commission· is increased to 20%, the gain is :

(1) $6\frac{2}{3}\%$ (2) $7\frac{1}{4}\%$

(3) $12\frac{1}{2}\%$ (4) $13\frac{1}{3}\%$

31. A dealer purchases 22 pencils for Rs. 20 and sells them at the rate of 10 pencils for Rs. 11. His profit percent is .

(1) 10% (2) 20% (3) 21% (4) 22%

32. By selling a ceiling fan for Rs. 475. A dealer loses 5%. To get a gain of 5%, he should sell the fan for.

(1) Rs. 575.00 (2) Rs. 525.00

(3) Rs. 522.50 (4) Rs. 498.75

33. A cycle is sold at 20% gain. If it had been sold at 20% loss, the selling price would have been Rs. 120 less. The cost price of the cycle is

(1) Rs. 500 (2) Rs.300

(3) Rs. 250 (4) Rs. 200

34. A dishonest shopkeeper uses false balance and cheats a customer by giving 20% less quantity of food. His profit is

(1) 80% (2) 75% (3) 25% (4) 20%

35. Ram sold a watch to Shyam at a gain of 5% and Shyam sold it to Hari at a gain of 4%. If Hari paid Rs. 1092 for it, the price paid by Ram is

(1) Rs. 993.72 (2) Rs. 996

(3) Rs. 1000 (4) Rs. 995.90

36. The cost of 10 copies of a book equals the selling price of 8 copies. What is the percentage of gain or loss incurred?

(1) 30% gain (2) 25% loss

(3) 25% gain (4) 30% loss

37. If a man reduces the selling price of a fan from 400 to Rs. 300, his loss increases by 20%. The cost price of the fan in rupees is :

(1) 600 (2) 480

(3) 500 (4) None of these

38. A dealer sold a VCR for Rs. 10800 at loss of 20%. At what price should he have sold it to gain 12.5%?

(1) Rs. 15450 (2) Rs. 15580

(3) Rs. 15625 (4) Rs 15187.50

39. A man buys an old car for Rs. 33000 and sells it at a gain of 2%. If his overhead expenses are 1% he sold the care for nearly

(1) Rs.33990.00 (2) RS.33993.80

(3) RS.33995.10 (4) Rs.33996.60

40. The list price of a T.V. is Rs. 14400. It is sold for two successive discounts of 25% and 10%, it will sell for

(1) Rs.9580 (2) Rs.9600

(3) Rs.9720 (4) Rs.9880

41. If the list price of an article be x and the price after discount be (x– y) then the rate of discount is

(1) y% (2) $\frac{100y}{x}\%$

(3) $\frac{100x}{y}\%$ (4) 100 y%

42. If a commission of 10% is given on the marked price, the gain is 50%. If the commission is increased to 25% the gain will be.

(1) 25% (2) 35% (3) 40% (4) 25%

43. A man sold a watch for Rs. 600 at a loss. Had he sold it for Rs. 750, his gain would have been double of the former loss. The cost price of the watch is

(1) Rs. 800 (2) Rs.700

(3) Rs. 670 (4) Rs 650

44. The marked price of a watch was Rs. 720. A man bought the same for Rs. 550.80 after getting two successive discounts, the first being 10%. What was the second discount rate?

(1) 12% (2) 14% (3) 15% (4) 18%

45. A retailer buys 30 articles from a wholesaler at the price of 27. If he sells them at their marked price, the gain percent in the transaction is

(1) $9\frac{1}{11}\%$ (2) 10%

(3) $11\frac{1}{9}\%$ (4) $16\frac{2}{3}\%$

46. By selling an umbrella for Rs, 300, a shopkeeper gains 20%. During a clearance sale, the shopkeeper allows a discount of 10% on the marked price. His gain percent during the sale is :

(1) 7 (2) 7.5 (3) 8 (4) 9

47. The cost price of an article is 64% 'of the marked price. Calculate the gain percent after allowing a discount of 12%.

(1) 37.5% (2) 48% (3) 50.5% (4) 52%

48. A shopkeeper allows a discount of 10% on the marked price of an item but charges a sales tax of 8% on the discounted price. If the customer pays Rs. 680.40 as the price including the sales tax, then what is the marked price of the item ?

(1) Rs. 630 (2) Rs. 700

(3) Rs. 780 (4) None of these

49. At what percent above the cost price must a shopkeeper mark his goods so that he gains 20% even after giving a discount of 10% on the marked price?

(1) 25% (2) 30%

(3) $33\frac{1}{3}\%$ (4) $37\frac{1}{2}\%$

50. By selling an article at $\frac{2}{5}$ of the marked price, there is a loss of 25%. The ratio of the marked price and the cost price of the article is :

(1) 2 : 5 (2) 5 : 2

(3) 8 : 15 (4) 15 : 8

51. A trader marked the selling price of an article at 10% above the cost price. At the time of selling, he allows certain discount and suffers a loss of 1%. He allowed a discount of :

(1) 9% (2) 10% (3) 10.5% (4) 11%

52. A shopkeeper fixes the marked price of an item 35% above its cost price. The percentage of discount allowed to gain 8% is :

(1) 20% (2) 27% (3) 31% (4) 43%

53. A trader marked his goods at 20% above the cost price. He sold half the stock at the marked price, one quarter at a discount of 20% on the marked price and the rest at a discount of 40% on the marked price. His total gain is :

(1) 2% (2) 4.5% (3) 13.5% (4) 15%

54. The labelled price of a cupboard is Rs. 6500. The shopkeeper sold it by giving 5% discount on the labelled price and earned a profit of 15%. What approximately is the cost price of the cupboard?

(1) Rs. 5000 (2) Rs. 5370

(3) Rs. 5600 (4) Rs. 5800

55. Kunal bought a suitcase with 15% discount on the labelled price. He sold the suitcase of Rs. 2880 with 20% profit on the labelled price. At what price did he buy the suitcase.

(1) Rs. 2040 (2) Rs. 2400

(3) Rs. 2604 (4) Rs. 2640

56. A shopkeeper sells a badminton racket, whose marked price is Rs. 30, at a discount of 15% and gives a shuttle cock costing Rs. 1.50 free with each racket. Even then he makes a profit of 20%. His cost price per racket is

(1) Rs. 19.75 (2) Rs. 20

(3) Rs. 21 (4) Rs. 21.25

57. A shopkeeper sold a T.V. set for Rs. 17,940 with a discount of 8% and earned a profit of 19.6%. What would have been the percentage of profit earned if no discount was offered?

(1) 24.8% (2) 25%

(3) 26.4% (4) None of these

58. A shopkeeper sells 25 articles at Rs. 45 per article after giving 10% discount and earns 50% profit. If the discount is not given, the profit gained is :

(1) 60% (2) $60\frac{2}{3}\%$

(3) 66% (4) $66\frac{2}{3}\%$

59. A shopkeeper sold sarees at Rs. 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?

(1) Rs. 240 (2) Rs. 260

(3) Rs. 280 (4) None of these

60. 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 was offered?

(1) 24.5 (2) 28.5

(3) 30 (4) None of these

61. Komal buys an article at a discount of 25%. At what percentage above the cost price should he sell it to make a profit of 25% over the original list price?

(1) 25 (2) 30

(3) 40 (4) 66.67

62. Tarun got 30% concession on the labelled price of an article and sold it for Rs. 8750 with 25% profit on the price he bought. What was the labelled price?

(1) Rs. 10,000 (2) Rs. 12,000

(3) Rs. 16,000 (4) None of these

63. A bag marked at Rs. 80 is sold for Rs. 68. The rate of discount is

(1) 12% (2) 15%

(3) $17\frac{11}{17}\%$ (4) 20%

64. A shopkeeper sells two watches for Rs. 308 each. On one he gains 12% and on the other, he loses 12%. His gain or loss percent in the whole transaction is :

(1) No loss no profit (2) $1\frac{11}{25}$% loss

(3) $1\frac{11}{25}$% profit (4) $3\frac{2}{25}$% loss

65. Vipin sold two horses for Rs. 3990 each. On one he gained 5% and on the other he lost 5 percent. His net gain or loss is

(1) No loss no profit

(2) Rs. 20 loss

(3) Rs. 20 gain

(4) None of these

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	2	3	3	4	3	2	2	2	4	4	3	4	3	3	
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	4	2	2	3	4	3	3	1	4	1	2	1	4	4	
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	3	2	2	3	3	3	3	4	4	3	2	1	4	3	
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	3	1	2	3	4	2	1	1	2	1	2	4	4	4	
Que.	61	62	63	64	65										
Ans.	3	1	2	2	2										