

MODULE 5 – PROFIT & LOSS

1. If a man reduces the selling price of a fan from 400 to 380, his loss increases by 20%. What is the cost price of the fan?

- (a) 100 (b) 200 (c) 400 (d) 500

Solution:

Note: Increase in loss%, not in loss amount

Increase in loss% = 20%

Consider loss is x initially, so final loss will increase by $0.2x$ which is equal to 20.

$$0.2x = 20$$

$$x = 100$$

So, total cost = selling price + loss = $400 + 100 = 500$

2. A vendor bought 15 oranges at Rs. 36 for 5 oranges and sold all of them at four oranges for Rs. 45. How much did the vendor earn or lose in this transaction?

- (a) Loses Rs. 4.05 per orange (b) Gain Rs. 4.05 per orange
(c) Gains Rs. 60 overall (d) Loses Rs. 5.06 per orange

Solution:

$$\text{C.P of 15 oranges} = 36 \times 3 = 108$$

$$\text{S.P of 15 oranges} = (45/4) \times 15 = 168.75$$

$$\text{Profit for 15 oranges} = 168.75 - 108 = 60.75$$

$$\text{Profit for 1 orange} = 4.05$$

So, answer is profit of Rs. 4.05 per orange

3. Ram sells onions on the streets of Chandni Chowk. Due to a recent shortfall in the supply of onions, he doubles his selling price despite the cost price remaining the same for him due to a fixed price contract. He realises that his profit triples. Find the original profit percent.

- (a) $200/3$ (b) 100 (c) $316/3$ (d) 120

Solution:

Let the C.P be Rs.100 and S.P be Rs. x , then the profit is $x-100$

Now the S.P is doubled then the new S.P is $2x$

New profit is $2x - 100$

Now as per the given condition; $3(x - 100) = 2x - 100$

Solving we get $x = 200$

Then the profit percent = $(200 - 100)/100$

Hence the profit percentage is 100%

4. Ankit bought 20 soaps and 12 toothpastes. He marked-up the soaps by 15% on the cost price of each and the toothpastes by Rs. 20 on the cost price of each. He sold 75% of the soaps and 8 toothpastes and made a profit of Rs. 385. If the cost of a toothpaste is 60% the cost of a soap and he got no return on unsold items, what was his overall profit or loss?

(a) Loss of Rs. 355

(b) Profit of Rs. 210

(c) Loss of Rs. 250

(d) Profit of Rs. 255

Solution:

Let the CP of soap be Rs. 100 each, then the CP of toothpaste would be Rs. 60 each

Ankit has sold 15 soaps and 8 toothpastes. On each toothpaste, he makes a profit of Rs.20, hence his profit on 8 toothpastes would be Rs.160. Thus, his profit on 15 soaps would be $(Rs.385 - Rs.160) = Rs.225$.

His profit per soap = $225/15 = Rs.15$.

According to the problem, he gets no return on unsold items. Hence, 5 soaps and 4 toothpastes would be a complete loss for him. The loss he would incur for these items = $5 \times 100 + 4 \times 60 = Rs.740$. But he has already made a profit of Rs. 385. Hence, the overall loss would be $(Rs. 740 - Rs. 385) = Rs. 355$.

5. A trader bought two horses for ₹19,500. He sold one at a loss of 20% and the other at a profit of 15%. If the selling price of each horse is the same, then their cost prices are respectively.

(a) 10,000 and 9,500

(b) 11,500 and 8,000

(c) 12,000 and 7,500

(d) 10,500 and 9,000

Solution:

Let the cost price of first horse be Rs. x

Then, cost price of second horse = Rs. $(19500 - x)$

Therefore, $x \times 80/100 = (19500 - x) \times 115/100$

$$\square 80x = 19500 \times 115 - 115x$$

$$\square 80x + 115x = 19500 \times 115$$

$$\square 195x = 19500 \times 115$$

$$\square x = Rs. 11500$$

Cost price of second horse = $19500 - 11500 = Rs. 8000$

6. The cost price of a commodity is 1,331. By selling it at a discount of 100, the dealer makes a profit of 9.09%. If he decides not to give any discount, then what will be the profit made by him?

(a) 131

(b) 121

(c) 221

(d) 231

Solution:

$$9.09\% = 1/11$$

$$SP \text{ at } 9.09\% \text{ profit} = 1331 \times 12/11$$

$$= Rs. 1452$$

If he don't offer any discount, then $SP = Rs. 1552$

His profit = $1552 - 1331 = Rs. 221$

7. The par value of the shares of company X and Y is 10. The market price of the shares are 40 and 50 respectively. Find the ratio of the return on investment for an investor if the dividends are 20% and 40% respectively. Investment in both the cases is the same.

- (a) 5:8 (b) 8:5 (c) 8:13 (d) 13:8

Solution:

	X	Y
Par Value	10	10
Market Price	40	50
Dividend	20%	40%
Investment	a	a

Therefore, number of shares each of them bought = $\frac{a}{40}$, $\frac{a}{50}$

(Dividend) Income

\square 20% of 10 = 2

\square 40% of 10 = 4

Total return incomes of X = $\frac{a}{40} \times 2 \times 100 = 5a$

Total return incomes of Y = $\frac{a}{50} \times 4 \times 100 = 8a$

Therefore, Ratio = 5 : 8

8. The difference between a discount of 35% and two successive discounts of 20% on a certain bill was Rs.22. Find the amount of the bill.

- (a) Rs.244.44 (b) Rs. 1,100 (c) Rs. 4,400 (d) Rs. 2,200

Solution:

Effective successive discount percentage of X% and Y%

$= X + Y - \frac{XY}{100} \%$

Now x = 20% and y = 20%

For two successive discounts the net discount

$\square (20) + (20) - \frac{(20)(20)}{100} = 36\%$

Now let the amount of bill be Rs. x

\square (Two successive 20% discounts on x) – 35% of x = 22

\square 36% of x – 35% of x = 22

\square 1% of x = 22

\square $\frac{x}{100} = 22$

\square x = Rs. 2200

9. If a shopkeeper offers a discount of 20% on the list price of a washing machine, then he makes a profit of 12%. What percent profit or loss will he make if he sells it at a discount of 25% on the list price?

- (a) 0.6% loss (b) 0.5% profit (c) 4.25% loss (d) 5% profit

Solution:

Let the CP of the washing machine be Rs. 100 and list price be x

Then, $x - x \times \frac{20}{100} = 112$

$$\square 0.8x = 112$$

$$\square x = \text{Rs. } 140$$

When the shopkeeper gives a discount of 25%, then

$$\begin{aligned}\text{Selling price} &= 140 - 140 \times 25\% \\ &= 140 - 35 = \text{Rs. } 105\end{aligned}$$

Hence. There will be a profit of 5%

10. Manoj marks up his goods by 40% and gives a discount of 10%. Apart from this, he uses a faulty balance also, which reads 1000 gm for 800 gm. What is his net profit percentage?

- (a) 37.5% (b) 57.5% (c) 8% (d) None

Solution:

Let the CP of 1kg of goods be ₹100

Actual cost price for the shopkeeper is ₹80 as he is selling only 800gm using a faulty scale.

Markup of 40% makes it 140 and a discount of 10% makes it 126. Selling price of 1kg of goods is ₹126.

$$\begin{aligned}\text{Hence the percentage profit} &= \frac{126 - 80}{80} \times 100 \\ &= 57.5\%\end{aligned}$$

11. A merchant marks up the price of an article by 40% and 45% successively. Then he gives a discount of 20% and 25% successively. Find the profit percentage earned by the merchant.

- (a) 21.8% (b) 23.2% (c) 20.7% (d) 19.6%

Solution:

Let the cost price of an article be x.

After the mark up, the price of the article is $x \times (1 + 40\%) \times (1 + 45\%)$

$$\square x \times 1.4 \times 1.45$$

$$\square 2.03x$$

The total discount percentage is $1 - ((1 - 20\%) \times (1 - 25\%))$

$$\square (1 - 0.8 \times 0.75)$$

$$\square 40\%$$

$$\square \text{Selling Price} = 2.03x \times (1 - 0.4) = 2.03x \times 0.6 = 1.218x$$

$$\square \text{Profit} = 1.218x - x = 0.218x$$

$$\square \text{Profit\%} = \frac{0.218x}{x} \times 100 = 21.8\%$$

12. Given below is a question followed by three statements. Study the statements and decide which of the statement(s) is/are necessary to answer the question. What was the discount percentage given?

I) On selling the table, for Rs 12650, 26.5 %, Profit was earned.

II) If there had been no discount, 30% would have been earned as profit.

III) The Cost price of the table was Rs 10000

- (a) Only I and II (b) Only II and III
(c) Only I and III (d) Any two of the above

Solution:

From statement – I

$$\text{S.P.} = \text{Rs } 12650, \text{ Profit} = 26.5\%$$

$$\therefore \text{C.P} = 100 \frac{126.5}{12650} = 10000$$

From statement II

Mark Price = 130% of C.P. = Rs 13000

\therefore From statement I and II

Discount = Rs (13000 - 12650) = Rs 350

Discount % = $\frac{35}{13000} \times 100$ and Therefore, can be calculated

\therefore Statement I and II can give the answer. However, statement II and III together cannot.

Statements I and II can give the answer.

13. A publisher printed 3000 copies of 'Future Shock' at a cost of Rs. 2400. He gave 500 copies free to different philanthropic institutions. HE allowed a discount of 25% on the published price and gave one copy free for every 25 copies bought at a time. He was able to sell all the copies in this manner. If the published price is Rs. 3.25, then what is his overall gain or loss percentage in the whole transaction?

- (a) 113% (b) 130% (c) 162% (d) 144%

Solution:

Cost Rs. 2400

Published Price Rs. 3.25

SP = $\frac{75}{100} \times 3.25 = \text{Rs. } 2.4375$

Number of free copy = $(3000/25) = 120 + 500 = 620$

So, total SP = $2380 \times \text{Rs. } 2.4375 = \text{Rs. } 5801.25$

Hence percentage gain = $\frac{5801.25 - 2400}{2400} \times 100 = 144\%$

14. X goes to the shopkeeper P to purchase a plant for Rs 350 and gives him a 1000-rupee note. P does not have the change and hence goes to shopkeeper Q to get the change. He then gives X, Rs 650. Later, Q realises that the 1000-rupee note is a duplicate note and asks P to return his money. P returns the money. What is the loss incurred by P if it is given that P sold the plant at a profit of 25%?

- (a) Rs 930 (b) Rs 2000 (c) Rs 1070 (d) Rs 1200

Solution:

Assume that initially, P does not have any money. He only has that plant whose selling price is Rs. 350

Cost price = $350 \frac{1.25}{1} = \text{Rs. } 280$

X gives Rs. 1000 to P and P gives that money to Q, in exchange for a change of Rs. 1000

He then gives Rs. 650 to X

□ P is left with Rs. 350

Now, Q asks for his Rs. 1000 back. P gives Rs. 350 and is in debt of Rs. 650

So, his total loss is Rs. 650 and the cost price of the plant, which is Rs. 280

Hence, the total loss = $650 + 280 = \text{Rs. } 930$

15. A pharmaceutical company manufactures 6000 strips of prescribed diabetic drugs for Rs. 800000 every month. In July 2014, the company supplied 600 strips of free medicines to the doctors at various hospitals. Of the remaining medicines, it was able to sell $\frac{4}{5}$ of the strips at 25% discount and the balance at the

printed price of Rs. 250. Assuming vendor's discount at the rate of a uniform 30% of the total revenue, the approximate percentage profit/ loss of the pharmaceutical company in July 2014 is :

- (a) 5.5% profit (b) 4% loss (c) **5.5 loss** (d) None of these

Solution:

It is given that a total of 6000 strips are manufactured out of which the company supplied 600 strips of free medicines to the doctors.

Hence, the number of strips which were sold = $6000 - 600 = 5400$

It is given that the company was able to sell $\frac{4}{5}$ of the strips at 25% discount and the balance at the printed price of Rs. 250

Total revenue generated by the firm =

$$(0.75 * 250) * (4/5 * 5400) + (250) * (1/5 * 5400) = \text{Rs. } 1080000$$

$$\text{Net revenue after vendor's discount} = 0.7 * 1080000 = \text{Rs. } 756000$$

We can see that the company invested Rs. 800000 for the drug creation.

$$\text{Hence, Percentage loss incurred by the company} = \frac{800000 - 756000}{800000} * 100 = 5.5\%$$

HOMEWORK:

1. A cloth store is offering "Buy 3, get 1 free." What is the net percentage discount being offered by the store?

- (a) 25% (b) $33 \frac{1}{3}\%$ (c) 20% (d) 75%

Solution:

Let the price of one shirt be Rs. 100. Then,

$$\text{Price of 4 shirts} = 4 * 100 = \text{Rs. } 400$$

Customer pays for 3 shirts i.e. Rs. 300

$$\text{Discount} = 400 - 300 = \text{Rs. } 100$$

$$\begin{aligned} \text{Discount\%} &= \frac{\text{Discount}}{\text{Total Price}} * 100 \\ &= \frac{100}{400} * 100 \\ &= 25\% \end{aligned}$$

2. At what price should a shopkeeper mark a radio that costs him 1,200 in order that he may offer a discount of 20% on the marked price and still make a profit of 25%?

- (a) 1,625 (b) 1,900 (c) 2,000 (d) 1,875

Solution:

$$\text{CP} = \text{Rs } 1200$$

$$\text{Profit} = 25\%$$

$$\text{Therefore, SP} = 125\% \text{ of } 1200 = \text{Rs. } 1500$$

$$\text{Discount \%} = \frac{(\text{Marked Price} - \text{SP})}{\text{Marked Price}} \times 100$$

$$20 \% = \frac{(\text{Marked Price} - 1500)}{\text{Marked Price}} \times 100$$

$$\square \text{ Marked Price} = \text{Rs. } 1875$$

3. Shelly goes to a shop to purchase a doll priced at Rs.400. She is offered 4 discount options by the shopkeeper. Which of these options should she opt for to gain maximum advantage of the discount offered?

- (a) Single discount of 30% (b) 2 successive discounts of 15% each
(c) 2 successive discounts of 20% and 10% (d) 2 successive discounts of 20% and 12%

Solution:

She should opt for a straight discount of 30% as that gives her the maximum benefit.

4. A shopkeeper sells two tables, each procured at cost price p, to Aarav and Asif at a profit of 20% and at a loss of 20%, respectively. Aarav sells his table to Vimal at a profit of 30%, while Asif sells his table to Varun at a loss of 30%. If the amounts paid by Vimal and Varun are x and y, respectively, then (x - y) / p equals

- (a) 1 (b) 1.2 (c) 0.7 (d) 0.50

Solution:

The Shopkeeper procures the table at price 'p'

He gains 20% on the transaction with Aarav

So, Aarav buys the table at '1.2p'

Aarav sells the table at 30% profit,

So the Selling Price of Aarav = $1.2p \times 1.3 = 1.56p$

$x = 1.56p$

The Shopkeeper loses 20% on the transaction with Asif

So, Asif buys the table at '0.8p'

Asif sells the table at 30% loss,

So the Selling Price of Asif = $0.8p \times 0.7 = 0.56p$

$y = 0.56p$

$(x - y)/p = (1.56p - 0.56p)/p = 1.$

5. A trader sells two bullocks for Rs. 8400 each neither losing nor gaining in total. If he sold one of the bullocks at 20% profit, the other is sold at a loss percentage of

- a)16.67% b)20% c)14.28% d)None

Total selling price of two bullocks = $8400 + 8400 = 16800$

\therefore Cost price of first bullock = $8400 \times 100/120 = \text{Rs. } 7000$

According to the question, there is no profit or loss.

\therefore Cost price of second bullock = $16800 - 7000 = \text{Rs. } 9800$

Selling price of second bullock = Rs. 8400 \therefore Loss = $9800 - 8400 = \text{Rs. } 1400$

\therefore Percentage loss on second bullock = $1400/9800 \times 100\% = 100/7\% = 14 \frac{2}{7}\%$. Hence, option c)