STAFF SELECTION COMMISSION – Solved Papers

PROFIT AND LOSS (Some Important Exercises)

1. If the selling price of 20 articles is the same as the cost price of 23 articles, find the profit percent.

(1) 15% (2) 16%

(3) 8% (4) 12%

Ans : (1)

Let the S.P. of 20 articles = Rs.x,

Then S.P. of 1 articles = Rs. $\frac{x}{20}$

Also the cost price of 23 articles = Rs.x

Then C.P. of 1 article = Rs. $\frac{x}{23}$

Profit = S.P. – C.P.

$= \frac{x}{20} - \frac{x}{23} = \frac{23x - 20x}{460}$

$= \text{Rs.}\frac{3x}{460}$

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

$= \frac{\frac{3x}{460}}{\frac{x}{23}} \times 100$

$= \frac{3x}{460} \times \frac{23}{x} \times 100 = 15\%$

2. Ramesh bought two boxes for Rs.1300. He sold one box at a profit of 20% and the other box at a loss of 12%. If the selling price of both boxes is the same, find the cost price of each box.

(1) Rs.650, Rs.650

(2) Rs.550, Rs.750

(3) Rs.450, Rs.850

(4) None of these

Ans : (2)

Total price of two boxes = Rs.1300

Let C.P. of one box = Rs.x

Then C.P. of other box = Rs.$(1300 - x)$

Profit on 1st box = 20%

$\therefore$ S.P. of 1st box

$= x + \frac{20}{100}x$

$= \frac{100x + 20x}{100} = \text{Rs.}\frac{120x}{100}$

Loss on 2nd box = 12%

$\therefore$ S.P. of 2nd box = C.P. – Loss

$= (1300 - x) - \frac{12}{100}(1300 - x)$

$= (1300 - x)\left(1 - \frac{12}{100}\right)$

$= (1300 - x) \times \frac{88}{100}$

$= 1144 - \frac{88x}{100}$

But S.P. of both boxes is same

$\Rightarrow \frac{120x}{100} = 1144 - \frac{88x}{100}$

$\Rightarrow \frac{120x}{100} + \frac{88x}{100} = 1144$

$\Rightarrow \frac{208x}{100} = 1144$

$\Rightarrow x = \frac{1144 \times 100}{208} = 550$

$\therefore$ Cost price of 1st box = Rs.550

and cost price of another box = Rs.1300 – Rs.550 = Rs.750

3. A trader sells an article at a profit of 15%. If he had bought if for 15% less and had sold it for Rs.7.80 less, he would have gained 20%. Find the cost price of the article.

(1) Rs.65 (2) Rs.80

(3) Rs.60 (4) Rs.70

Ans : (3)

Case I : Let C.P. of the article = Rs.100

$\therefore$ The first selling price

= Rs.100 + Rs.15 = Rs.115

Case II : C.P. = 100 – 15 = Rs.85

S.P. = Rs. $\left(\frac{85 \times 120}{100}\right)$ = Rs.102

Difference in S.P.

= Rs.115 – Rs.102 = Rs.13

$\because$ If difference is Rs.13, then C.P. = Rs.100

$\therefore$ If difference is Rs. $\frac{78}{10}$, the

C.P. = $\frac{100}{13} \times \frac{78}{10}$ = Rs.60

4. Ram Kumar sold his motor cycle to Mohan at a loss of 28%. Mohan spent Rs.1680 on its repairs and sold the motor cycle to Sohan for Rs.35910, thereby, making a profit of

12.5%. Find the cost of the motor cycle for Ram Kumar.

(1) Rs.38000 (2) Rs.35000

(3) Rs.40000 (4) Rs.42000

Ans : (4)

Let C.P. of motor cycle for Ram Kumar = Rs.x

S.P. for Ram Kumar

$= x - \frac{28}{100}x = \text{Rs.}\frac{72}{100}x$

$\therefore$ Cost for Mohan = Rs. $\frac{72}{100}x$

Cost of repairing = Rs.1680

$\therefore$ Total C.P. for Mohan = Rs.

$\frac{72}{100}x + \text{Rs.}1680$

Profit earned by Mohan = 12.5%

S.P. for Mohan = C.P. + Profit

$= \frac{72}{100}x + \text{Rs.}1680$

$+ \frac{12.5}{100}\left(\frac{72}{100}x + 1680\right)$

S.P. $= \left(\frac{72}{100}x + 1680\right)\left(\frac{112.5}{100}\right)$

But S.P. for Mohan is given

= Rs.35910

$\Rightarrow \left(\frac{72x}{100} + 1680\right) = \frac{35910 \times 100}{112.5}$

$\Rightarrow \frac{72x}{100} + 1680 = 31920$

$\Rightarrow x = \frac{30240 \times 100}{72}$

= Rs.42000

So, the cost price of the motor cycle for Ram Kumar

= Rs.42000

5. A shopkeeper reduces the price of his goods by 50% at the time of sale. Initially the price was fixed to get a profit of 25% on selling price after allowing 10% cash discount. Find out his approximate percentage of profit or loss.

(1) 26% loss (2) 28% profit

(3) 30% loss (4) 26% profit

Ans : (1)

Let initial S.P. = Rs.100

Profit = 25% of Rs.100 = Rs.25

$\therefore$ C.P. = Rs.100 – Rs.25 = Rs.75

Now, when

Marked Price		Discount	S.P.	
100	↓	10	90	↓
?		—	100	

$\therefore ? = \frac{100 \times 100}{90} = \text{Rs.}\frac{1000}{9}$

$\therefore$ New S.P. = 50% of

Rs. $\frac{1000}{9}$, that is, $\frac{1000}{9} \times \frac{50}{100}$

$= \text{Rs.}\frac{500}{9} = \text{Rs.}55\frac{5}{9}$

$\therefore$ Loss = Rs.75(Old Price) – Rs.$55\frac{5}{9}$ (New S.P.)

$= \text{Rs.}19\frac{4}{9}$

$\therefore$ When

S.P.		Loss percent	
75	↑	$19\frac{4}{9}$	↓
100		x	

Where x = loss percent

$\therefore x = \frac{100}{75} \times \frac{175}{9}$

Loss percent = $\frac{700}{27} = 25\frac{25}{27}\%$

6. A wholesaler sells 20 pens at the marked price (printed on the article) of 16 pens to a retailer. The retailer in turn sells them at the marked price. Determine the gian or loss percent to the retailer.

(1) 25% loss (2) 25% profit

(3) 20% loss (4) 20% profit

Ans : (2)

Let the marked price of 1 pen = Rs.100

$\therefore$ MP of 20 pens

$= 20 \times 100 = \text{Rs.}2000$

MP of 16 pens

$= 16 \times 100 = \text{Rs.}1600$

C.P. of 20 pens for retailer

= Rs.1600

S.P. of 20 pens for retailer

= Rs.2000

$\therefore$ Profit = Rs.400

Profit % = $\frac{400}{1600} \times 100 = 25\%$

7. A defective briefcase costing Rs. 800 is being sold at a loss of 8%. If the price is further reduced by 5%. Find its approximate selling price.

(1) Rs.600 (2) Rs.650

(3) Rs.700 (4) Rs.725

Ans : (3)

C.P. = Rs.800

Loss = 8%

$\Rightarrow$ S.P. = Rs.800 – Rs. $\frac{8}{100} \times 800$

= Rs.800 – Rs.64 = Rs.736

Reduction 5% = $\frac{5}{100} \times 736$

$\therefore$ Reduced S.P.

= Rs.736 – Rs.736$\times \frac{5}{100}$

= Rs.736 – Rs.36.80

= Rs.699.20

$\therefore$ Selling price = Rs.699.20

8. A shopkeeper buys 40 bicycles and marks them at 25% above the cost price. He allows a discount of 10% on the marked price for cash sales, and 5% for credit sales. If three-fourth of the stock is sold for cash and the rest for credit, and if the total profit be Rs.20250, what is the cost price of a bicycle?

(1) Rs.4000 (2) Rs.3500

(3) Rs.3200 (4) Rs.3600

Ans : (4)

Number of bicycles = 40

Let C.P. of one bicycle = Rs.x

$\therefore$ Marked price of each bicycle

= $\frac{125}{100}x$ = Rs.1.25x

Discount for cash sale = 10%

Discount for credit sale = 5%

$\therefore$ S.P. for cash sale

= 1.25$x\times \frac{90}{100}$

= Rs.(1.25$x\times$ 0.9)

= Rs.1.125x

S.P. for credit sale

= 1.25$x\times \frac{95}{100}$

= Rs.(1.25$x\times$ 0.95)

= Rs.1.1875x

Number of bicycles sold for cash = 30

Number of bicycles sold on credit = 10

$\therefore$ Total S.P. = Rs.[1.125$x\times$ 30 + 1.1875$x\times$ 10]

= Rs.45.625x

$\therefore$ Profit = Rs.(45.625 – 40)x

= Rs.5.625x

But actual profit = Rs.20250

$\therefore$ 5.625x = 20250

$\Rightarrow x = \frac{20250}{5.625}$ = Rs.3600

Hence, C.P. of a bicycle = Rs.3600

9. A dealer sold two coolers at Rs.2970 each. On selling one cooler, he gained 10% on selling the other he lost 10%. Find the dealer's gain or loss percent

(1) 1% loss (2) 1% loss

(3) 2% loss (4) 2% gain

Ans : (1)

S.P. of one cooler = Rs.2.970

Profit % = 10%

Let C.P. of the cooler = x

Then, S.P. = C.P. + Profit

$\Rightarrow 2970 = x + \frac{10}{100}x$

$\Rightarrow 2970 = \frac{110}{100}x$

$\Rightarrow \frac{2970}{110} \times 100 = x$

$\Rightarrow x$ = Rs.2700

For 2nd cooler

S.P. = Rs.2970

Loss = 10%

Let C.P.= y, then

S.P. = C.P. – Loss $\Rightarrow$ 2970

= y – $\frac{10}{100}$y

$\Rightarrow \frac{90y}{100} = 2970 \Rightarrow$ y = Rs.3300

$\therefore$ Total cost price for coolers

= Rs.2700 + Rs.3300 = Rs.6000

Total selling price for two coolers

= Rs.2970 + Rs.2970

= Rs.5940

Hence, loss

= Rs.6000 – Rs.5940 = Rs.60

Loss % = $\frac{60}{6000} \times 100 = 1\%$

10. A man buys some quantity of wheat for Rs.2400. He sells one-third of it at a profit of 5%. At what percent gain should he sell the remaining two-thrid so as to make an overall profit of 10% on the whole transaction?

(1) 11.5% (2) 12.5%

(3) 13% (4) 13.5%

Ans : (2)

C.P. of $\frac{1}{3}$rd of wheat

= Rs. $\frac{2400}{3}$ = Rs.800

S.P. of $\frac{1}{3}$rd of wheat

$= \frac{105}{100} \times 800 = \text{Rs.}840$

C.P. of total wheat = Rs.2400

Required S.P. of total wheat

$= \text{Rs.}\left(\frac{110}{100} \times 2400\right) = \text{Rs.}2640$

C.P. of remaining $\frac{2}{3}$rd of wheat

$= \frac{2}{3} \times 2400 = \text{Rs.}1600$

Required S.P. of remaining $\frac{2}{3}$rd wheat

= Rs.2640 – Rs.840

= Rs.1800

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

Therefore, required profit %

$= \frac{1800 - 1600}{1600} \times 100$

$= \frac{25}{2}\% = 12\frac{1}{2}\%$

11. A man purchases some mangoes at the rate of 3 for Rs.4 and the same quantity at 5 for Rs.6. If he sells all the mangoes at the rate of 3 for Rs.5, find his approximate gain or loss percent.

(1) 35% loss (2) 32% loss

(3) 32% profit (4) 35% gain

Ans : (3)

Suppose he purchases 1 mango in each case.

$\because$ C.P. of 3 mangoes = Rs.4

$\therefore$ C.P. of 1 mango = $\text{Re.}\frac{4}{3}$

Again,

$\because$ C.P. of 5 mangoes = Rs.6

$\therefore$ C.P. of 1 mango = $\text{Rs.}\frac{6}{5}$

$\therefore$ C.P. of 2 (mixed) mangoes

$= \frac{4}{3} + \frac{6}{5} = \frac{20 + 18}{15} = \text{Rs.}\frac{38}{15}$

$\therefore$ C.P. of 1 mango

$= \frac{1}{2} \times \frac{38}{15} = \text{Rs.}\frac{19}{15}$

Now, $\because$ S.P. of 3 mangoes = Rs.5

$\therefore$ S.P. of 1 mango = $\text{Rs.}\frac{5}{3}$

$\therefore$ Profit = $\frac{5}{3} - \frac{19}{15} = \text{Re.}\frac{6}{15}$

$= \text{Re.}\frac{2}{5}$

$\because$ Profit on $\text{Rs.}\frac{19}{15} = \text{Re.}\frac{2}{5}$

$\therefore$ Profit on $\text{Re.}1 = \frac{2}{5} \times \frac{15}{19}$

$\therefore$ Profit on Rs.100

$= \frac{2}{5} \times \frac{15}{19} \times 100 = \text{Rs.}31\frac{11}{19}$

Hence, profit = $31\frac{11}{19}\%$

12. What percent above cost price should goods be marked for sale so that after allowing $12\frac{1}{2}$% gtrade discount and 5% cash discount, a net gain of 33% may be earned?

(1) 45% (2) 40%

(3) 50% (4) 60%

Ans : (4)

If the C.P. is Rs.100, the cash selling price = Rs.133.

Now, let invoice price (after allowing T.D.) be 100 cash discount = 5%

$\therefore$ When,

Cash S.P.	Invoice price
100 – 5 = 95	100
133	

$\therefore \quad ? = \frac{133 \times 100}{95} = \text{Rs.}140$

Now, Trade discount = $12\frac{1}{2}\%$

$\therefore$ Marked price $100 - 12\frac{1}{2}$ T.D.

$= 87\frac{1}{2}$ (Invoice price)

When,

Invoice price	Marked price
$87\frac{1}{2}$	100
140	x

$\therefore \; x = \frac{140 \times 100 \times 2}{175} = \text{Rs.}160$

Thus, marked price should be 60% = (160 – 100) above cost.