Profit And Loss

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October 2024

1 Introduction

Definition 1.1 (Profit)**.** *Profit is usually given in relative aspects such as % over the buying price unless otherwise specified. It is something like buying a product and selling it for* 20% *profit. This means that if we buy a product for* 100₹*we have sold it for* 120₹*.*

Note: If we think it of like that, we profited 20% meaning if we think we have sold it in 100₹and then we have, we bought the product in 80₹. This is also possible. But, in this case, we would be given that the profit happens over the selling price. So, by default, we assume that profit is taken over the price of buying.

Definition 1.2 (Loss)**.** *Loss is negative of profit. If we lose* 20% *this means we profited* -20%*. That's all. Now, continue as above simply.*

2 Important Questions

Question 2.1 (43)**.** *We had 400kg sugar among which some portion is sold at* 20% *profit and some portion is sold at* 5% *loss. Overall we gained* $7\frac{3}{4}\%$ *profit. What amount of sugar is then sold at a* 5% *loss?*

Answer: We are given kg but we have to know the price at which the sugar is bought so that we can apply the profit and loss concept. So, let 1 kg sugar be bought at rupees at r₹. Then 400kg is bought at $400r$₹. Now, let we x kg sugar is sold at 5% loss. So, $400 - x$ kg is sold at 20% profit. Now, The buying price of $x$kg sugar is xr₹, and the buying price of $(400 - x)$kg sugar is $(400 - x)r$₹. Now, the selling price of $x$kg sugar is $xr \times \frac{95}{100}$₹and same for other part is $(400 - x)r \times \frac{120}{100}$₹. But in total we have $7\frac{3}{4}\%$ gain. So, we have the total selling price $= 400r \times \frac{100+\frac{31}{4}}{100}$₹.
So, we have the following equation:

$$xr \times \frac{95}{100} + (400 - x)r \times \frac{120}{100} = 400r \times \frac{100 + \frac{31}{4}}{100}$$

$$\Rightarrow x \times \frac{95}{100} + (400 - x) \times \frac{120}{100} = 400 \times \frac{100 + \frac{31}{4}}{100}$$

Conclusion: We need not even consider the price of sugar as it is, in the end, canceling out. This is because the price and the amount of sugar are in simple proportion.