Unit 7 · Profit and Loss

STUDY NOTES

Key terms

Cost price (C.P.): what the seller pays for a thing.
Selling price (S.P.): what it is sold for.
Profit: S.P. more than C.P.; in rupees, the **actual profit**.
Loss: S.P. less than C.P.; in rupees, the actual loss.
Profit percent: the profit on every Rs 100 spent.
Loss percent: the loss on every Rs 100 spent.

Formulas

$\text{Profit} = \text{S.P.} - \text{C.P.}$	S.P. > C.P. **Use:** profit in rupees
$\text{Loss} = \text{C.P.} - \text{S.P.}$	C.P. > S.P. **Use:** loss in rupees
$\text{Profit percent} = \frac{\text{Profit}}{\text{C.P.}} \times 100\%$	always on the **cost price** **Use:** profit percent
$\text{Loss percent} = \frac{\text{Loss}}{\text{C.P.}} \times 100\%$	always on the **cost price** **Use:** loss percent
$\text{S.P.} = \text{C.P.} \pm \text{profit or loss}$	+ profit, − loss **Use:** selling price

Why a percent

- Rs 200 on a Rs 1,000 T-shirt: a good day; Rs 200 on a Rs 1,00,000 motorbike: almost nothing
- a percent compares a small business with a big one
- on the **C.P.** because that is the money the seller put in
- "profit percent" with nothing more → on the cost price

Model drawing: C.P. = 100 parts

	C.P.	S.P.
10% profit	100x	110x (110% of C.P.)
5% profit	100x	105x
10% loss	100x	90x

The three kinds of question

Percent from the prices

- watch: C.P. 1,200, S.P. 1,500 → profit 300 → 300/1200 × 100% = **25%**
- T-shirt: C.P. 1,000, S.P. 1,200 → **20%**; S.P. 950 → loss 50 → **5%**
- goat: 16,000 → 18,400: 2,400/16,000 × 100% = **15%**

S.P. from C.P. and the percent

- heater C.P. 2,500 at 10% profit: profit = 10/100 × 2,500 = 250 → S.P. **Rs 2,750**; or 100x = 2,500 → x = 25 → 110x = 2,750
- rice Rs 3,200 at 5% loss: loss 160 → S.P. **Rs 3,040**

C.P. from S.P. and the percent

1. let the C.P. be x (or 100x)
2. S.P. = x + percent of x: 21,000 = x + 5/100 × x = 105x/100
3. solve: x = 21,000 × 100/105 = **Rs 20,000**; check 20,000 + 1,000 = 21,000 ✓

- then at 10%: S.P. = 20,000 + 2,000 = **Rs 22,000** (= 110 parts of Rs 200)
- bag sold for Rs 1,380 at 15% profit: 115/100 × x = 1,380 → x = **Rs 1,200**

Costs and broken goods

- **extra costs** (transport, repairs) go into the **C.P.**: fridge 32,500 + 500 = 33,000; sold 33,500 → 500/33,000 × 100% ≈ **1.52%**
- **by the rate**: C.P. = quantity × rate: 10 kg at Rs 55 = 550; at Rs 60 = 600 → 50/550 × 100% ≈ **9.09%**
- **broken or spoiled**: pay for all, sell only the rest
  - 50 bulbs at Rs 40 = 2,000; 35 sold at Rs 60 = 2,100 → profit **5%**
  - 20 dozen at Rs 120 = 2,400; 10% profit → S.P. 2,640 for 17 dozen → 2,640 ÷ 17 ≈ **Rs 155.30** a dozen

Back to the two businesses

- Prapti: Rs 10,000 on Rs 1,50,000 → ≈ **6.67%**
- Sandesh: Rs 8,000 on Rs 20,000 → **40%**: his money worked much harder
- a percent shows how hard each rupee worked, not everything; these matter too:
  - the amount
  - how much can be sold
  - the time taken

COMMON MISTAKES

✗ profit percent on the S.P.: 200/1200 × 100% ≈ 16.67%
✓ on the C.P.: 200/1000 × 100% = 20%.

✗ C.P. from S.P. 21,000 at 5% profit: 21,000 − 5% of 21,000 = 19,950
✓ the 5% is of the unknown C.P.: 105x/100 = 21,000, so x = 20,000.

✗ loss = S.P. − C.P. (a negative number)
✓ loss = C.P. − S.P.

✗ more rupees of profit = the better business
✓ compare profit percents: 40% beats 6.67%.