

AI1110 Assignment 1

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Q8(c): The printed price of an air conditioner is Rs.45,000/-. The wholesaler allows a discount of 10% to the shopkeeper. The shopkeeper sells the article to the customer at a discount of 5% of the marked price. Sales tax (under VAT) is charged at the rate of 12% at every stage. Find:

- VAT paid by the shopkeeper to the government.
- The total amount paid by the customer inclusive of tax.

Solution:

TABLE I
TABLE WITH INPUT AND OUTPUT VARIABLES, THEIR SYMBOLS, THEIR FORMULAE AND VALUES:

| Description | Symbol | Formula | Value |
|---------------------------------|--------|----------------------------|----------|
| Marked Price | MP | - | Rs.45000 |
| Discount for shopkeeper | d1 | - | 10% |
| Discount amount for shopkeeper | disc1 | $MP \times \frac{d1}{100}$ | Rs.4500 |
| Selling Price for shopkeeper | SP1 | $MP - \text{disc1}$ | Rs.40500 |
| Sales Tax | s | - | 12% |
| Tax amount for shopkeeper | t1 | $SP1 \times \frac{s}{100}$ | Rs.4860 |
| Discount for customer | d2 | - | 5% |
| Discount amount for customer | disc2 | $MP \times \frac{d2}{100}$ | Rs.2250 |
| Selling Price for customer | SP2 | $MP - \text{disc2}$ | Rs.42750 |
| Tax amount for customer | t2 | $SP2 \times \frac{s}{100}$ | Rs.5130 |
| VAT paid by shopkeeper to govt. | V | $t2 - t1$ | ? |
| Total Amount paid by customer | T | $SP2 + t2$ | ? |

Formulae used according to the Table I:

$$\text{disc} = MP \times \frac{d}{100} \quad \dots \quad (1)$$

$$SP = MP - \text{disc} \quad \dots \quad (2)$$

$$t = SP \times \frac{s}{100} \quad \dots \quad (3)$$

Marked Price(MP) = Rs.45,000/-

Sales Tax(s) = 12%

Discount for shopkeeper (d1) = 10%

Discount amount for shopkeeper (disc1)

$$= 45000 \times \frac{10}{100} = \text{Rs.}4500 \quad \dots \text{by (1)}$$

Selling Price for shopkeeper (SP1) =

$$45000 - 4500 = \text{Rs.}40500 \quad \dots \text{by (2)}$$

Sales Tax for shopkeeper(t1)

$$= 40500 \times \frac{12}{100} = \text{Rs.}4860 \quad \dots \text{by (3)}$$

Discount for customer (d2) = 5%

Discount amount for customer(disc2)

$$= 45000 \times \frac{5}{100} = \text{Rs.}2250 \quad \dots \text{by (1)}$$

Selling Price for customer (SP2)

$$= 45000 - 2250 = \text{Rs.}42750 \quad \dots \text{by (2)}$$

Sales tax for customer (t2)

$$= 42750 \times \frac{12}{100} = \text{Rs.}5130 \quad \dots \text{by (3)}$$

Hence,

- Tax for customer - Tax for shopkeeper = VAT paid by shopkeeper to government(V)

$$= 5130 - 4860 = \boxed{\text{Rs.}270}$$

- Selling price for customer + Tax for customer = Total amount paid by customer(T)

$$= 42750 + 5130 = \boxed{\text{Rs.}47880}$$

VAT paid to government by shopkeeper = Rs.270
Amount paid by customer inclusive of tax = Rs.47880

Fig. 1. The output of the program used for verification: