



Profit Loss Discount And VAT Ex 13.1

Profit, Loss, Discount and Value Added Tax (VAT) :-

1) Given

Student buys a pen for Rs 90

$$C.P = 90$$

and sell it for Rs 100

$$S.P = 100$$

Here $S.P > C.P$

So, He gets profit or gain

$$\therefore \text{Gain} = S.P - C.P$$

$$= 100 - 90 = 10$$

$$\text{and we have \% Gain} = \frac{\text{Gain}}{C.P} \times 100$$

by substituting

$$\% \text{ Gain} = \frac{10}{90} \times 100$$

$$= \frac{100}{9} \% = 11 \frac{1}{9} \quad \left[\text{converting into mixed fraction} \right]$$

$$\therefore \% \text{ Gain} = 11 \frac{1}{9} \%$$



②

Given

$$\text{C.P of Saree} = 1240$$

$$\text{S.P of Saree} = 1147$$

Here $\text{C.P} > \text{S.P}$, So, Rekha get loss

$$\text{Loss} = \text{C.P} - \text{S.P}$$

$$= 1240 - 1147$$

$$= 93$$

$$\therefore \text{loss} = 93$$

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

$$= \frac{93}{1240} \times 100 = 7.5 \%$$

$$\therefore \text{percentage loss is } 7.5$$

③

Given

A boy buys 9 apples for Rs 9.60 and sells them at 11 apples for Rs 12. To avoid fractions boy buys and sells $9 \times 11 = 99$ apples.

we have

$$\text{C.P for 9 apples} = \text{Rs } 9.60$$

$$\text{C.P for 1 apple} = \frac{9.60}{9}$$

$$\text{C.P for 99 apples} = 99 \times \frac{9.60}{9} = 105.6 \text{/-}$$

$$\text{S.P for 11 apples} = \text{Rs } 12$$

$$\text{S.P for 1 apple} = \frac{12}{11}$$

$$\text{S.P for 99 apples} = \frac{12}{11} \times 99 = 108 \text{/-}$$



clearly

S.P > C.P, He will get profit

$$\therefore \text{Gain} = 108 - 105.6 = \text{S.P} - \text{C.P}$$

$$= 2.4$$

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

$$= \frac{2.4}{105.6} \times 100 = \frac{25}{11} = 2 \frac{3}{11} \%$$

(4)

Given

C.P of 10 articles = S.P for 9 articles

Let C.P of one article be 'x'

$$\therefore \text{S.P for 9 articles} = 10x$$

$$\text{S.P for 1 article} = \frac{10x}{9}$$

$$\begin{aligned} \text{Profit} &= \text{S.P} - \text{C.P} = \frac{10x}{9} - x \\ &= \frac{x}{9} \end{aligned}$$

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

by Substituting

$$\% \text{ profit} = \frac{\frac{x}{9}}{x} \times 100$$

$$= \frac{1}{9} \times 100$$

$$= \frac{100}{9} = 11 \frac{1}{9} \%$$



⑤

Given

Retailer buys radio for Rs. 225

His Overhead expenses Rs 15

$$\therefore \text{C.P. of radio} = 225 + 15 \\ = 240$$

$$\text{S.P. of radio} = 300$$

$$\therefore \text{S.P.} > \text{C.P.}$$

$$\text{profit} = \text{S.P.} - \text{C.P.} \\ = 300 - 240 = 60$$

$$\% \text{ profit} = \frac{\text{profit}}{\text{C.P.}} \times 100 = \frac{60}{240} \times 100 \\ = \frac{60}{240} \times 100 = 25\%$$

⑥

Retailer buys a cooler for Rs 1200

expenses on it Rs 40

Total price i.e, C.P = 1240

$$\text{S.P.} = 1550$$

$$\% \text{ profit} = \frac{\text{profit}}{\text{C.P.}} \times 100 \\ = \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100 \\ = \frac{1550 - 1240}{1240} \times 100 \\ = 25\%$$



(7)

$$\begin{aligned}\text{c.p of wristwatch} &= \text{Rs } 225 + \text{expenses} \\ &= 225 + 15 \\ &= 240.\end{aligned}$$

$$\text{s.p of watch} = 300 \quad \text{Here } \text{Sp} > \text{c.p}$$

$$\begin{aligned}\% \text{ profit} &= \frac{300 - 240}{240} \times 100 \\ &= 25\%.\end{aligned}$$

(8)

Let

Ramesh bought first box for Rs 'x'.

$$\text{Cost for Second box} = 1300 - x.$$

For First box

$$\text{He gets profit } 20\% = \frac{\text{Profit}}{\text{c.p}} \times 100$$

$$\frac{20}{100} = \frac{\text{s.p} - \text{c.p}}{\text{c.p}}$$

$$\therefore \text{s.p} = x + \frac{20x}{100} \quad \text{--- (1)}$$

for Second box

$$\text{He losses } 12\% = \frac{\text{c.p} - \text{s.p}}{\text{c.p}} \times 100$$

$$\frac{12}{100} = \frac{\text{c.p} - \text{s.p}}{\text{c.p}}$$

$$\text{s.p} = \text{c.p} - \frac{12}{100} \cdot \text{c.p} \quad \text{for Second one}$$

$$\text{c.p} = 1300 - x$$

$$\text{s.p} = (1300 - x) - \frac{12}{100} (1300 - x)$$



$$\begin{aligned} \text{S.P} &= 1200 - x - 156 + \frac{12x}{100} \\ &= 1144 - \frac{22}{25}x \quad \text{--- (2)} \end{aligned}$$

Given Selling price of both boxes are same

$$\therefore \quad \text{①} = \text{②}$$

$$x + \frac{20x}{100} = 1144 - \frac{22}{25}x$$

$$x \left(1 + \frac{20}{100} + \frac{22}{25} \right) = 1144$$

$$x \times \frac{52}{25} = 1144$$

$$x = 550$$

$$\therefore \text{C.P of one box} = 550$$

$$\begin{aligned} \text{C.P of Second box} &= 1200 - 550 \\ &= 750 \end{aligned}$$

⑨ Given Let C.P of one pen = x
S.P of 10 pens = C.P of 14 pens

$$\text{S.P of 1 pen} = \frac{14x}{10}$$

$$\begin{aligned} \% \text{ Gain} &= \frac{\text{S.P} - \text{C.P}}{\text{C.P}} \times 100 \\ &= \frac{\frac{14x}{10} - x}{x} \times 100 = \frac{x \left(\frac{14}{10} - 1 \right)}{x} \times 100 \\ &= 40\% \end{aligned}$$



(10)

Let C.P of one chair = x

Given

C.P for 18 chairs = S.P for 16 chairs

$$\text{S.P for 1 chair} = \frac{18x}{16}$$

$$\text{clearly } \text{S.P} > \text{C.P} \quad \therefore \frac{18x}{16} = 1.125x$$

we get profit

$$\begin{aligned}\therefore \text{profit \%} &= \frac{\text{S.P} - \text{C.P}}{\text{C.P}} \times 100 \\ &= \frac{\frac{18}{16}x - x}{x} \times 100 \\ &= x \left(\frac{18-16}{16} \right) \times 100 \\ &= \frac{2}{16} \times 100 \\ &= 12.5\%\end{aligned}$$

$$\text{profit \%} = 12.5\%$$

(11)

Let C.P of 1 orange = x

Given

S.P of 18 oranges = $16x$

$$\text{S.P} = \frac{16x}{18}$$

clearly C.P > S.P

$$\begin{aligned}\therefore \% \text{ loss} &= \frac{\text{C.P} - \text{S.P}}{\text{C.P}} \times 100 \\ &= x \left(1 - \frac{16}{18} \right) \times 100 = \frac{100}{9} = 11\frac{1}{9}\%\end{aligned}$$



(12) Let C.P of motor cycle for Ravish = x

Ravish sells it for a 28% loss

$$\frac{28}{100} = \frac{\text{Loss}}{\text{C.P}} = \frac{\text{C.P} - \text{S.P}}{\text{C.P}}$$

$$\text{S.P} = x - \frac{28x}{100} = x \left(\frac{18}{25} \right)$$

$$\therefore \text{C.P of Vineeth} = \frac{18x}{25} + 1680 \quad \text{--- (1)}$$

(expenses)

$$\text{S.P of Vineeth} = \text{Rs } 35910 \text{ for profit} = 12.5\%$$

$$\therefore \frac{12.5}{100} = \frac{\text{S.P} - \text{C.P}}{\text{C.P}}$$

by Substituting (1) and (2)

$$\frac{12.5}{100} \left(\frac{18x}{25} + 1680 \right) = 35910 - \frac{18x}{25} - 1680$$

$$\frac{9x}{100} + 210 = 34230 - \frac{18x}{25}$$

$$\frac{9x}{100} + \frac{18x}{25} = 34020$$

$$x \left(\frac{81}{100} \right) = 34020$$

$$x = \frac{34020 \times 100}{81}$$

$$x = 42000$$

$$\therefore \text{C.P for Ravish} = \text{Rs } 42000/-$$



(13)

Given

$$\text{S.P. of book} = \text{Rs } 258$$

$$\text{gain} = 20\% = \frac{20}{100} = \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}}$$

$$\frac{20 \times \text{C.P.}}{100} + \text{C.P.} = \text{S.P.}$$

$$\text{C.P.} \left(\frac{120}{100} \right) = 258$$

$$\text{C.P.} = 215$$

To get 30%, let S.P. be x

$$\therefore \frac{30}{100} = \frac{x - 215}{215}$$

$$x = 215 \left(\frac{30}{100} + 1 \right)$$

$$x = 215 \times \frac{130}{100} = 279.50$$

$\therefore$ So, to get 30% profit, he should sell it for Rs 279.50

(14)

$$\text{C.P. of brickcase} = 800$$

$$\text{loss} = 8\% = \frac{\text{C.P.} - \text{S.P.}}{\text{C.P.}}$$

$$\frac{8}{100} = \frac{\text{C.P.} - \text{S.P.}}{\text{C.P.}}$$

$$\text{S.P.} = -\frac{8}{100} \text{C.P.} + \text{C.P.}$$

$$\text{S.P.} = \frac{92}{100} \text{C.P.} = 736$$



Given it is further reduced by 5 %

$$\begin{aligned} S.P &= \frac{95}{100} \times 736 \\ &= 699.20 \end{aligned}$$

(15) Given

S.P for 90 ball pens = 160

$$\text{loss} = \frac{20}{100} = \frac{S.P - C.P}{C.P}$$

$$\frac{20}{100} \times C.P = C.P - S.P$$

$$C.P = \frac{S.P}{\left(1 - \frac{20}{100}\right)}$$

$$C.P = \frac{160}{80} \times 100$$

$$C.P = 200$$

$\therefore$ C.P for 90 ball pens = 200

C.P of 1 ball pen = $\frac{200}{90}$

Given to get 20 %

S.P for x pens = 96

S.P for 1 pen = $\frac{96}{x}$

$$\text{profit} = 20\% = \frac{20}{100} = \frac{S.P - C.P}{C.P}$$

$$\frac{20}{100} = \frac{\frac{96}{x} - \frac{200}{90}}{\left(\frac{200}{90}\right)}$$

$$\left(\frac{20}{100} \times \frac{200}{90}\right) + \frac{200}{90} = \frac{96}{x}$$

$$x = 36 \quad \therefore \text{no. of ball pens} = 36$$



(16)

Let the c.p of article = x

profit = 25 %

$$\frac{25}{100} = \frac{s.p - c.p}{c.p}$$

$$s.p = \frac{125}{100} \cdot c.p = \frac{125}{100} \cdot x$$

Given that

15 the c.p of article 20% less than x

$$(c.p)_2 = \frac{80}{100} x$$

and $(s.p)_2 = \frac{125}{100} x - 36.75$, He get 30% profit

$$\therefore \frac{30}{100} = \frac{(s.p)_2 - (c.p)_2}{(c.p)_2}$$

$$\left(\frac{30}{100}\right) \times \frac{80}{100} x = \frac{125x}{100} - 36.75 - \frac{80}{100} x$$

$$\frac{24}{100} x = \frac{45x}{100} - 36.75$$

$$36.75 = \frac{21x}{100}$$

$$x = 175$$

Cost price of article = 175/-



(17)

Let

$$\text{C.P for } 1000 \text{ gm pulses} = x$$

but

$$\text{S.P for } 950 \text{ gm pulses} = x$$

$$\therefore \text{S.P for } 1000 \text{ grams} = \frac{1000 \times x}{950}$$

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

$$= \frac{\frac{1000x}{950} - x}{x} \times 100$$

$$= \left(\frac{1000}{950} - 1 \right) \times 100 = \frac{100 \times 50}{950}$$

$$= \frac{100}{19} = 5 \frac{5}{19} \%$$

(18)

Let

$$\text{C.P of one table be } x$$

$$\text{C.P of second table} = 3120 - x$$

For first table

$$\text{Loss} = 15 \%$$

$$\frac{15}{100} = \frac{\text{C.P} - \text{S.P}}{\text{C.P}}$$

$$\text{S.P} = \text{C.P} - \frac{15}{100} \text{ C.P}$$

$$\text{S.P} = \frac{85}{100} x \quad \text{--- (1)}$$



For Second table

$$c.p = 3120 - x$$

Gain 36 %

$$\frac{36}{100} = \frac{s.p - c.p}{c.p}$$

$$\frac{36}{100} [3120 - x] = s.p - (3120 - x)$$

$$1123.20 - \frac{36x}{100} = s.p - 3120 + x$$

$$4243.20 - \frac{136x}{100} = s.p \quad \text{--- (2)}$$

Given

s.p of both tables are same

$$\frac{85x}{100} = 4243.20 - \frac{136x}{100}$$

$$\frac{141x}{100} = 4243.20$$

$$\frac{221x}{100} = 4243.20$$

$$x = 1920$$

$$\therefore c.p \text{ of one table} = 1920 \text{ | -}$$

$$c.p \text{ of Second table} = 3120 - 1920 \\ = 1200 \text{ | -}$$



(19)

let c.p of One fan = x c.p of Second fan = $3605 - x$

For One fan:-

$$\text{c.p} = x$$

$$\text{profit} = 15\% = \frac{15}{100} = \frac{\text{s.p} - x}{x}$$

$$\text{s.p} = \frac{15x}{100} + x$$

$$\text{s.p} = \frac{115x}{100} \quad \text{--- (1)}$$

For Second fan:-

$$\text{c.p} = 3605 - x$$

$$\text{loss} = 9\% = \frac{\text{c.p} - \text{s.p}}{\text{c.p}} \times 100$$

$$\frac{9}{100} = \frac{(3605 - x) - \text{s.p}}{(3605 - x)}$$

$$\text{s.p} = 3605 - x - \frac{9}{100} (3605 - x)$$

$$\text{s.p} = \frac{65611}{20} - x + \frac{9x}{100} \quad \text{--- (2)}$$

Given

s.p of both fans are same

$$(1) = (2)$$

$$\frac{115x}{100} = \frac{65611}{20} - x + \frac{9x}{100}$$



$$\frac{115x}{100} = \frac{65611}{20} - x + \frac{9x}{100}$$

$$\frac{115x}{100} + x - \frac{9x}{100} = \frac{65611}{20}$$

$$\frac{103}{50}x = \frac{65611}{20}$$

$$x = 1592.50$$

$$\begin{aligned} \text{c.p of Second fan} &= 3605 - 1592.50 \\ &= 2012.50 \end{aligned}$$

(20) Given

A man buys a set of 11 toffees for Rs 10
and another set of 9 toffees for Rs 10

to avoid fractions, let us assume
he buys total $11 \times 9 = 99$ toffees.

for 99 toffees

first set contains 11 toffees

So, he buys 9 sets of 11 toffees for 9×10
= 90/-

He buys 11 sets of 9 toffees for 11×10
= 110/-

$$\text{Total c.p} = 110 + 90 = 200$$

$$\text{Total toffees} = 198$$

$$\text{c.p of each toffee} = \left(\frac{200}{198}\right) \text{ given s.p} = 1$$

$$\text{c.p} > \text{s.p} \quad \% \text{ loss} = \left(\frac{\frac{200}{198} - 1}{\frac{200}{198}}\right) \times 100 = 1 \%$$



(21)

Let 'x' be c.p of tricycle

Sold for gain of 16 %.

$$\frac{16}{100} = \frac{S.P - x}{x}$$

$$S.P = \frac{16x}{100} + x$$

$$S.P = \frac{116x}{100}$$

If S.P is 100 more, then gain = 20 %.

$$\frac{20}{100} = \frac{S.P - C.P}{C.P}$$

$$\frac{20}{100} x = \frac{116x}{100} + 100 - x$$

$$\frac{120x}{100} - \frac{116x}{100} = 100$$

$$\frac{4x}{100} = 100$$

$$x = \frac{100 \times 100}{4} = 2500$$

$$x = 2500$$

 $\therefore$ c.p of tricycle = 2500/-

(22)

Given

She bought 16 dozen ball pens

Loss for 16 dozen pens

= S.P of 8 ball pens.



Let 'x' be c.p of each pen

$$\text{c.p of 16 dozens} = 16 \times 12 \times x$$

$$\text{Loss} = (\text{s.p}) 8$$

$$16 \times 12 \times x - 16 \times 12 \times \text{s.p} = (\text{s.p}) 8$$

$$16 \times 12 \times x = (200) \times \text{s.p}$$

$$\text{s.p} = \frac{192}{200} x$$

$$\text{Loss \%} = \frac{\text{c.p} - \text{s.p}}{\text{c.p}} \times 100$$

$$= \left(\frac{x - \frac{192x}{200}}{x} \right) \times 100$$

$$= \frac{8}{2} = 4 \%$$

$$\text{If c.p of 16 dozens} = 576$$

$$16 \times 12 \times x = 576$$

$$x = \frac{576}{16 \times 12}$$

$$\text{s.p of one pen} = \frac{192}{200} x$$

$$\text{s.p of dozen pens} = 12 \times \frac{192}{200} \times \frac{576}{12 \times 16}$$

$$= 34.56 \text{ ₹}$$



(23)

Let c.p of shirt = x

He sold one shirt for profit 4%.

$$\frac{4}{100} = \frac{s.p - c.p}{c.p}$$

$$s.p = \frac{104}{100} c.p \quad \text{--- (1)}$$

He sold other shirt for profit 5%.

$$\frac{5}{100} = \frac{s.p - c.p}{c.p}$$

$$s.p = \frac{105}{100} c.p \quad \text{--- (2)}$$

Given difference between 2 shirts = 6
s.p. of

$$\therefore \frac{105}{100} c.p - \frac{104}{100} c.p = 6$$

$$\frac{c.p}{100} = 6$$

$$c.p = 600$$

Cost price of shirt = 600

$$\begin{aligned} \text{Selling price of one shirt} &= \frac{104}{100} \times 600 \\ &= 624 \text{/-} \end{aligned}$$

$$\begin{aligned} \text{Selling price of other shirt} &= \frac{105}{100} \times 600 \\ &= 630 \text{/-} \end{aligned}$$

Let 'x' be c.p of 16 dozens

1 dozen c.p is $\frac{x}{16}$ 1 pen c.p is $\frac{x}{16 \times 12}$



(24)

$$\text{c.p of 100 hens} = 8000$$

$$\text{c.p of 1 hen} = 80$$

and sold 20 box. gain 5%.

$$\frac{5}{100} = \frac{\text{S.P} - \text{C.P}}{\text{C.P}}$$

$$\text{S.P} = \frac{105}{100} \text{ C.P}$$

$$\text{S.P} = \frac{105}{100} \times 80 = 84$$

$$\begin{aligned}\text{Selling price for 20 hens} &= 84 \times 20 \\ &= 1680\end{aligned}$$

$$\text{Let S.p of remaining 80 hens} = 80x$$

On whole gain = 20%

$$\frac{20}{100} = \frac{(\text{S.P})_{\text{total}} - (\text{C.P})_{\text{total}}}{(\text{C.P})_{\text{total}}}$$

$$\frac{20}{100} = \frac{(80x + 1680) - 8000}{8000}$$

$$9600 = 80x + 1680$$

$$x = 99$$

Profit for these hens

$$\begin{aligned}\text{Profit \%} &= \frac{99 - 80}{80} \times 100 \\ &= \frac{19}{80} \times 100 = 23.75\%\end{aligned}$$



Profit Loss Discount And VAT Ex 13.2

Exercise :- 13.2

①

i) Given $M.P = 1300$

$$\text{Discount} = 10\% = \frac{\text{Discount}}{M.P} \times 100$$

$$\frac{10}{100} = \frac{M.P - S.P}{M.P}$$

$$\frac{10}{100} M.P = M.P - S.P$$

$$S.P = M.P - \frac{10}{100} M.P$$

$$S.P = \frac{90}{100} \times 1300 = 1170 \text{/-}$$

ii)

Given $M.P = 500$

$$\text{discount} = 15\%$$

$$\frac{M.P - S.P}{M.P} \times 100 = 15$$

$$S.P = -\frac{15}{100} M.P + M.P$$

$$S.P = M.P \left(1 - \frac{15}{100} \right)$$

$$= 500 \times \frac{85}{100}$$

$$S.P = 425 \text{/-}$$



(2) Given

i) $S.P = Rs\ 1222$

discount = 6 %

$$\frac{6}{100} = \frac{M.P - S.P}{M.P}$$

$$\frac{6}{100} M.P = M.P - S.P$$

$$S.P = M.P - \frac{6}{100} M.P$$

$$\frac{100 \times 1222}{(100 - 6)} = M.P$$

$$M.P = 1300$$

ii)

$$S.P = Rs\ 495$$

discount = 1 %

$$\frac{1}{100} = \frac{M.P - S.P}{M.P}$$

$$\frac{M.P}{100} = M.P - S.P$$

$$S.P = M.P - \frac{M.P}{100}$$

$$\frac{495 \times 100}{99} = M.P$$

$$M.P = 500$$



③

1) Given

$$M.P = Rs\ 900$$

$$S.P = Rs\ 873$$

$$\text{discount} = M.P - S.P$$

$$= 900 - 873$$

$$= 27$$

$$\% \text{ discount} = \frac{\text{discount}}{M.P} \times 100$$

$$= \frac{27}{900} \times 100 = 3\%$$

ii) Given

$$M.P = Rs\ 500$$

$$S.P = Rs\ 425$$

$$\% \text{ discount} = \frac{M.P - S.P}{M.P} \times 100$$

$$= \frac{500 - 425}{500} \times 100$$

$$= \frac{75}{500} \times 100 = 15\%$$

④

Given

$$\text{Marked price} = Rs\ 650/-$$

$$\text{discount} = 3\%$$

$$\text{discount} = \frac{3}{100} = \frac{M.P - S.P}{M.P}$$

$$\frac{3}{100} M.P = M.P - S.P$$

$$S.P = \frac{97}{100} \times M.P$$

$$S.P = \frac{97}{100} \times 650 = 630.5$$

$$\text{Customer has to pay} = 630.50/-$$



⑤ Given Marked price = 720
Selling price = 684
discount = M.P - S.P
 $= 720 - 684 = 36$
% discount = $\frac{\text{discount}}{\text{M.P}} \times 100$
 $= \frac{36}{720} \times 100 = 5\%$
discount = 5%

⑥ Given Saree is Sold for Rs 720 = S.P
discount = 20%
 $\frac{20}{100} = \frac{\text{M.P} - \text{S.P}}{\text{M.P}}$
 $\frac{20}{100} \text{M.P} = \text{M.P} - 720$
 $720 = \frac{80}{100} \text{M.P}$
 $\text{M.P} = \frac{720 \times 100}{80}$
 $\text{M.P} = 900$

⑦ Given discount = $7\frac{1}{2}\%$
 $= \frac{15}{2}\%$
and S.P = Rs 555



$$\frac{15}{2} = \text{discount \%}$$

$$\left(\frac{15}{100}\right) = \frac{M.p - S.p}{M.p}$$

$$\frac{15}{200} \cdot M.p = M.p - 555$$

$$555 = \frac{185}{200} M.p$$

$$M.p = \frac{555 \times 200}{185}$$

$$M.p = 600/-$$

②

Given

Customer gives 10 % off on marked price

$$\text{discount} = 10 \%$$

$$\text{and } M.p = 250/-$$

$$\frac{10}{100} = \frac{M.p - S.p}{M.p}$$

$$S.p = M.p - \frac{10}{100} M.p$$

$$S.p = \frac{90}{100} \times 250$$

$$S.p = 225$$

and he gets 25 % profit

$$\frac{25}{100} = \frac{S.p - C.p}{C.p}$$



$$\frac{25}{100} \text{ c.p} = \text{s.p} - \text{c.p}$$

$$\frac{125}{100} \text{ c.p} = \text{s.p}$$

$$\text{c.p} = \frac{225 \times 100}{125}$$

$$\text{c.p} = 180 \text{ | -}$$

9

Given M.P = 500

$$\text{discount} = 20\% \Rightarrow \frac{20}{100} = \frac{\text{M.P} - \text{S.P}}{\text{M.P}}$$

$$\text{S.P} = \frac{80}{100} \cdot \text{M.P}$$

$$\text{S.P} = \frac{80}{100} \times 500 = 400 \text{ | -}$$

He gets profit of 25%.

$$\frac{25}{100} = \frac{\text{S.P} - \text{C.P}}{\text{C.P}}$$

$$\frac{125}{100} \text{ C.P} = \text{S.P}$$

$$\text{C.P} = \frac{100}{125} \times 400$$

$$\text{C.P} = 320$$

So, he gets the article for Rs 320 | -



$$\frac{25}{100} \text{ c.p} = \text{s.p} - \text{c.p}$$

$$\frac{125}{100} \text{ c.p} = \text{s.p}$$

$$\text{c.p} = \frac{225 \times 100}{125}$$

$$\text{c.p} = 180 \text{ | -}$$

9

Given M.P = 500

$$\text{discount} = 20\% \Rightarrow \frac{20}{100} = \frac{\text{M.P} - \text{s.p}}{\text{M.P}}$$

$$\text{s.p} = \frac{80}{100} \cdot \text{M.P}$$

$$\text{s.p} = \frac{80}{100} \times 500 = 400 \text{ | -}$$

He gets profit of 25%.

$$\frac{25}{100} = \frac{\text{s.p} - \text{c.p}}{\text{c.p}}$$

$$\frac{125}{100} \text{ c.p} = \text{s.p}$$

$$\text{c.p} = \frac{100}{125} \times 400$$

$$\text{c.p} = 320$$

So, he gets the article for Rs 320 | -



(10)

Given c.p of article = 170

$$\text{profit} = 20\%$$

$$\frac{20}{100} = \frac{\text{S.P} - \text{C.P}}{\text{C.P}}$$

$$\text{S.P} = \frac{120}{100} \times \text{C.P}$$

$$\text{S.P} = \frac{120}{100} \times 170$$

$$\text{S.P} = 204 \quad \text{and}$$

$$\text{discount} = 15\%$$

$$\Rightarrow \frac{15}{100} = \frac{\text{M.P} - \text{S.P}}{\text{M.P}}$$

$$\frac{15}{100} \text{ M.P} = \text{M.P} - \text{S.P}$$

$$\text{S.P} = \frac{85}{100} \text{ M.P}$$

$$\text{M.P} = \frac{100 \times 204}{85}$$

$$\text{M.P} = 240$$

(11)

Given

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

$$\frac{\text{M.P} - \text{S.P}}{\text{M.P}} = \frac{25}{100}$$

$$\therefore \text{M.P} - \text{S.P} = \frac{25}{100} \text{ M.P}$$

$$\text{S.P} = \frac{75}{100} \text{ M.P} \quad \text{--- (1)}$$



and given profit = 50%.

$$\frac{50}{100} = \frac{\text{S.P} - \text{C.P}}{\text{C.P}}$$

$$\text{S.P} = \frac{50}{100} \text{C.P} + \text{C.P}$$

$$\text{S.P} = \frac{150}{100} \text{C.P} \quad \text{--- (2)}$$

we know (1) = (2)

$$\frac{75}{100} \text{M.P} = \frac{150}{100} \text{C.P}$$

$$\frac{\text{C.P}}{\text{M.P}} = \frac{75}{150} = \frac{1}{2}$$

ratio of C.P : M.P = 1 : 2

(12)

Given

Marked price on Cycle = 840

discount = 10 %.

$$\begin{aligned} \therefore \text{S.P of cycle} &= \frac{90}{100} \times 840 \\ &= 756 \text{/-} \end{aligned}$$

and profit = 26 %

$$\frac{\text{S.P} - \text{C.P}}{\text{C.P}} = \frac{26}{100}$$

$$\text{S.P} = \frac{126}{100} \text{C.P} \Rightarrow \text{C.P} = \frac{100 \times 756}{126}$$

$$\text{C.P} = 600 \text{/- (actual cost)}$$



(13)

Let advertised price be x

commission is 23% on advertised price

$$\therefore \text{Selling price} = \frac{77}{100} \cdot x \quad \text{--- (1)}$$

and given profit = 56

$$\text{profit \%} = 10$$

$$\frac{10}{100} = \frac{\text{profit}}{\text{c.p}}$$

$$\Rightarrow \text{c.p} = 560$$

$$\text{profit} = \text{s.p} - \text{c.p} = 56$$

$$\text{s.p} = 560 + 56$$

$$\text{s.p} = 616 \text{/-}$$

$$\therefore \frac{77}{100} x = 616 \quad (\because \text{from (1)})$$

$$x = \frac{61600}{77}$$

$$x = 800 \text{/-}$$

$$\therefore \text{advertised cat} = 800.$$

(14)

Given

Shop keeper marks his goods at 40% greater than cost price

Let cost price be ' x '

$$\text{marked price is } \frac{140}{100} x \quad (\because 40 \text{ more than } 100 \text{ if c.p is } 100)$$



discount on marked price is 5%.

$$\frac{5}{100} = \frac{M.P. - S.P.}{M.P.}$$

$$\therefore S.P. = \frac{95}{100} M.P.$$

$$S.P. = \frac{95}{100} \times \frac{140}{100} x$$

$$\text{Given } S.P. = 1064$$

$$1064 = \frac{95}{100} \times \frac{140}{100} \times x$$

$$x = 1064 \times \frac{100}{95} \times \frac{100}{140}$$

$$x = 800$$

$\therefore$ Cost price is 800

Selling price is 1064

$$\therefore \text{profit} = 1064 - 800 \\ = 264 \text{ ₹}$$

(15)

Given Earrings are brought at 25% discount

profit of seller = 16%

$$\frac{16}{100} = \frac{\text{profit}}{C.P.}$$

$$C.P. = \frac{3}{16} \times 100$$

$$C.P. = 200$$

Cost price of ear ring = 300 ₹



and

$$\text{profit} = 48$$

$$\text{s.p} - \text{c.p} = 48$$

$$\text{s.p} = \text{c.p} + 48$$

$$\text{s.p} = 348$$

and given discount = 25 %.

$$\frac{25}{100} = \frac{\text{M.p} - \text{s.p}}{\text{M.p}}$$

$$\text{s.p} = \frac{75}{100} \text{M.p}$$

$$\text{M.p} = \frac{100 \times 348}{75} = 116$$

$$\text{M.p} = 464$$

 $\therefore$ marked price = 464 ₹

(16)

Given

$$\text{printed price} = 275$$

$$\text{discount} = 32 \%$$

we have

$$\text{discount \%} = \frac{\text{M.p} - \text{s.p}}{\text{M.p}} \times 100$$

$$32 = \left(\frac{275 - \text{s.p}}{275} \right) \times 100$$

$$\frac{32}{100} \times 275 = 275 - \text{s.p}$$

$$\text{s.p} = 275 - \frac{32}{100} \times 275$$

$$\text{s.p} = 187 \text{ ₹}$$

Book seller should pay = 187 ₹.



(17)

Given discount = 20 %

$$\frac{M.p - S.p}{M.p} = \frac{20}{100}$$

$$S.p = \frac{80}{100} M.p \quad \text{--- (1)}$$

and trader lose is 10 %

$$\frac{C.p - S.p}{C.p} = \frac{10}{100}$$

$$S.p = \frac{90}{100} C.p \quad \text{--- (2)}$$

we have to find

% of marked price above cost price

$$\begin{aligned} \Rightarrow \frac{M.p - C.p}{C.p} \times 100 &= \frac{\left(\frac{100}{80}\right) S.p - \left(\frac{100}{90}\right) S.p}{\left(\frac{100}{90}\right) S.p} \times 100 \\ &= \frac{\left(\frac{100}{80}\right) - \left(\frac{100}{90}\right)}{\left(\frac{100}{90}\right)} \times 100 \\ &= \frac{100 \left[\frac{90 - 80}{90 \times 80} \right] \times 90}{100} \times 100 \\ &= \frac{1000}{80} = 12.5 \% \end{aligned}$$

$\therefore$ % of marked price above cost price
= 12.5 %



(18)

List price of table fan = Rs 480

$$M.p = 480$$

Retailer buys it at discount 25%.

 $\therefore$ Cost price for the Retailer is $\left(\frac{75}{100}\right) \times 480$

$$C.P = \frac{75}{100} \times 480$$

$$C.P = 360$$

Retailer Sells it to gain 15%.

$$15\% = \frac{S.P - C.P}{C.P} \times 100$$

$$\Rightarrow S.P = \frac{115}{100} \times C.P$$

$$S.P = \frac{115}{100} \times 360$$

$$S.P = 414.$$

Retailer should sell it for Rs 414 to get 15% gain.

(19)

Given

S.p of item by Rohit = 660 to get

10% profit

$$\frac{10}{100} = \frac{S.P - C.P}{C.P} \times 100$$

$$\frac{110}{100} C.P = S.P$$

$$C.P = \frac{100}{110} \times 660 = 600$$

Rohit brought that item for Rs 600/-
at 25% discount.



This is the selling price for shop keeper

∴ He offers 25% discount

$$\frac{25}{100} = \frac{M.P - S.P}{M.P}$$

$$\frac{25}{100} = \frac{(M.P - 600)}{\cancel{600} M.P}$$

$$\left(\frac{25}{100}\right)M.P = (M.P - 600)$$

$$600 = \frac{75}{100} M.P$$

$$M.P = \frac{600 \times 100}{75} = 800$$

$$M.P = 800 \text{ ₹}$$





(20)

Given

Cycle merchant offers 20% discount on M.P

$$\frac{20}{100} = \frac{M.P - S.P}{M.P}$$

$$S.P = \frac{80}{100} M.P \quad \text{--- (1)}$$

and he gets a profit of 20%.

$$\frac{20}{100} = \frac{\text{Profit}}{C.P}$$

$$C.P = \frac{360}{20} \times 100 \quad (\because \text{Gain} = 360)$$

$$C.P = 1800 \text{ ₹}$$

$$S.P = C.P + \text{gain} = 1800 + 360 \\ = 2160 \text{ ₹}$$

$$\therefore M.P = \frac{100}{80} \times S.P \quad (\because \text{from (1)})$$

$$M.P = \frac{100}{80} \times 2160$$

$$M.P = 2700 \text{ ₹}$$

(21)

Given

Cost price of garment = 1470 ₹

profit = 10%

$$\frac{S.P - C.P}{C.P} = \frac{10}{100}$$

$$S.P = \frac{110}{100} \times 1470 = 1617 \text{ ₹}$$

at a discount of 12.5%.



$$\frac{M.P - S.P}{M.P} \times 100 = 12.5$$

$$\frac{M.P - S.P}{M.P} = \frac{12.5}{100}$$

$$S.P = \left(1 - \frac{12.5}{100}\right) M.P$$

$$M.P = \frac{1617 \times 100}{87.5}$$

$$M.P = 1848 \text{/-}$$

Marked price on Suit = 1848/-

(22)

Aslam gets a pair of shoes for Rs 1200 and should gain 12 %.

$$\frac{S.P - C.P}{C.P} \times 100 = 12$$

$$S.P = \frac{112}{100} \times C.P = \frac{112}{100} \times 1200$$

$$S.P \text{ should be } 1344 \text{/-}$$

at discount 16 %.

$$\frac{M.P - S.P}{M.P} \times 100 = 16$$

$$M.P - S.P = \frac{16}{100} M.P$$

$$\frac{84}{100} M.P = S.P$$

$$M.P = \frac{1344 \times 100}{84}$$

$$M.P = 1600$$

marked price should be 1600/-



(23)

Given

Marked price, on shirt = ₹50/-
and sells at discount 4%.

$$\frac{4}{100} = \frac{M.P. - S.P.}{M.P.}$$

$$\frac{4}{100} M.P. = M.P. - S.P.$$

$$S.P. = \frac{96}{100} M.P.$$

$$S.P. = \frac{96}{100} \times ₹50$$

$$S.P. = ₹48/-, \text{ he should profit}$$

of 20%.

$$\therefore \frac{20}{100} = \frac{S.P. - C.P.}{C.P.}$$

$$S.P. = \frac{120}{100} \cdot C.P.$$

$$C.P. = \frac{100 \times ₹48}{120}$$

$$C.P. = ₹40/-$$

Cost price of shirt = ₹40/-

(24)

Given

Marked price = ₹1120/-

and sells at discount 10% off

$$S.P. = \frac{90}{100} \times M.P.$$

$$S.P. = \frac{90}{100} \times ₹1120 = ₹1008/-$$

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He should get profit of 26 %.

$$\frac{26}{100} = \frac{s.p - c.p}{c.p}$$

$$s.p = \frac{126}{100} c.p$$

$$c.p = \frac{100 \times 1008}{126}$$

$$c.p = 800/-$$

Cost price for pair of shoes = 800/-

(25)

Given

Marked price = Rs 1250/-

discount = 10 %

$$s.p = \left(\frac{90}{100}\right) \times m.p$$

$$= \frac{90}{100} \times 1250 = 1125/-$$

and he gets profit of 25 %

$$s.p = \frac{125}{100} \cdot c.p$$

$$c.p = \frac{100 \times 1125}{125}$$

$$c.p = 900$$

Cost price of pen = Rs 900/-



Profit Loss Discount And VAT Examples

Exercise 2-13.3

① List price of Refrigerator = Rs 9700

$$\text{VAT} = 6\%$$

$$\therefore \text{VAT} = 6\% \text{ of } 9700$$

$$= \frac{6}{100} \times 9700 = 582$$

$$\begin{aligned} \text{Total Amount one has to pay is} \\ = 9700 + 582 = 10282 \end{aligned}$$

②

Let 'x' be list price of watch

$$\text{given } \text{VAT} = 10\%$$

$$\text{VAT} = 10\% \text{ of } x = \frac{10}{100} x$$

$$\therefore \text{Total price} = x + \frac{10}{100} x$$

Given that

Vikram bought watch for Rs 825

$$x + \frac{x}{10} = 825$$

$$x \left(\frac{11}{10} \right) = 825$$

$$x = 750$$

$$\therefore \text{list price of watch} = 750/-$$



(3)

Let 'x' be list price of shirt

$$\text{VAT} = 7\% \text{ of } x$$

$$\text{Total price} = x + \frac{7}{100}x = \frac{107}{100}x$$

$$\therefore \frac{107x}{100} = 374.50$$

$$x = 374.50 \times \frac{100}{107}$$

$$x = 350/-$$

$$\text{list price of shirt} = 350$$

(4)

Given Sale price of shoes is Rs 175

$$\text{VAT} = 7\% \text{ of } 175$$

$$= \frac{7}{100} \times 175 = 12.25$$

$$\therefore \text{VAT} = 12.25$$

$$\begin{aligned} \therefore \text{Net value of pair of shoes} &= \text{Sale price} + \text{VAT} \\ &= 175 + 12.25 \\ &= 187.25 \end{aligned}$$



(5)

Given list price of shoes = 250

Let $x\%$ be VAT

$$\text{VAT} = \frac{x}{100} \times 250 = 20$$

$$x = \frac{20 \times 100}{250} = \frac{2000}{250} = 8$$

$$x = 8\%$$

$$\therefore \text{VAT} = 8\%$$

(6)

price of goods = 5500

He gets rebate or discount of 5%.

$$\begin{aligned}\therefore \text{Selling price} &= \frac{95}{100} \times 5500 \\ &= 5225/-\end{aligned}$$

and VAT = 5% S.P

$$= \frac{5}{100} \times 5225 = 261.25$$

Total Amount Karita has to pay is

$$= \text{S.P} + \text{VAT}$$

$$= 5225 + 261.25$$

$$= 5486.25$$



⑦ Let Original cost of furniture = x

$$\text{VAT} = 10\% \text{ of } x$$

$$\text{Total cost inclusive VAT} = x + \frac{10}{100}x$$

$$\therefore 7150 = x \left\{ \frac{110}{100} \right\}$$

$$x = 6500$$

$$\text{Original cost of furniture} = 6500$$

⑧ Let Original cost of furniture = x

$$\text{VAT} = \frac{10}{100}x$$

$$\text{Total Cost} = x + \frac{10}{100}x = 13750$$

$$x \left(\frac{110}{100} \right) = 13750$$

$$x = 12500$$

$$\text{Original cost of furniture} = 12500/-$$

⑨ Original cost of TV is Rs 12000

$$\text{Let VAT} = x\%$$

$$\therefore 12000 + \frac{x}{100} \times 12000 = 13440$$

$$\frac{x}{100} \times 120 = (13440 - 12000)$$

$$x \times 120 = 1440$$

$$x = \frac{1440}{120} = 12$$

$$\therefore \text{VAT} = 12\%$$



(10)

cost of radio = Rs 2568

let 'x' be sale price of radio

VAT = 7% of x

Total cost she has to pay = $(x + \frac{7}{100}x)$

$$x + \frac{7}{100}x = 2568$$

$$x \left(\frac{107}{100} \right) = 2568$$

$$x = \frac{256800}{107}$$

$$x = 2400$$

∴ Reduction in price of radio = $2568 - 2400$
= 168/-

(11)

Given

cost of a pair of shoes = Rs 800

cost of 2 pairs of shoes = 1600

$$\text{VAT} = 5\% \text{ of } 1600 = \frac{5}{100} \times 1600$$
$$= 80$$

$$\text{Amount paid for 2 pairs of shoes} = 1600 + 80 = 1680$$

cost of sewing machine = 1500

$$\text{VAT} = 6\% \text{ of } 1500 = \frac{6}{100} \times 1500 = 90$$

$$\text{Amount paid for sewing machine} = 1500 + 90 = 1590$$



$$\text{Cost for one Tea-set} = \text{Rs } 650$$

$$\text{Cost for two tea sets} = 650 \times 2 = 1300$$

$$\text{VAT} = 4\% \text{ of } 1300$$

$$= \frac{4}{100} \times 1300 = 52$$

$$\text{Amount paid for tea sets} = 1352$$

$$\text{Total Amount} = 1680 + 1590 + 1352$$

$$= 4622$$

(12)

$$\text{Let Sale price of motorcycle} = x$$

$$\text{VAT} = 10\% \text{ of } x$$

$$= \frac{10}{100} x$$

$$\text{Total cost} = x + \frac{10}{100} x = \frac{110}{100} x$$

$$\frac{110}{100} x = 17600$$

$$x = \frac{17600 \times 100}{110}$$

$$x = 16,000$$

$$\therefore \text{Sale price of motorcycle} = 16000 \text{ ₹}$$



(13)

Cost price of leather = 900

But Manoj pays 990 including VAT

$$\therefore \text{VAT} = 990 - 900 \\ = 90$$

Let $x\%$ be VAT

$$\frac{x}{100} \times 900 = 90$$
$$x = 10\%$$

 $\therefore$ VAT charged is 10%

(14)

Biscuits and Bakery products costing Rs 50

$$\text{VAT} = 5\% \text{ of } 50 \\ = \frac{5}{100} \times 50 = 2.50$$

Amount paid for Biscuits and bakery products = $50 + 2.50 = 52.50/-$

Medicines costing Rs 90

$$\text{VAT} = 10\% \text{ of } 90 \\ = \frac{10}{100} \times 90 = 9$$

Amount paid for Medicines = $90 + 9 = 99/-$

Clothes costing Rs 400

$$\text{VAT} = 1\% \text{ of } 400 = \frac{1}{100} \times 400 = 4$$

Amount paid for clothes = 404/-



Cosmetics costing Rs 150

$$\text{VAT} = 10\% \text{ of } 150$$

$$= \frac{10}{100} \times 150 = 15$$

Amount paid for cosmetics = 165

$$\text{Total Amount to be paid} = 52.50 + 99 + 404 + 165$$

$$= 720.50$$

(15)

Let 'x' be Sale price of set

$$\text{VAT} = 10\% \text{ of 'x'}$$

$$= \frac{10}{100} x$$

$$\text{Total cost} = x + \frac{10x}{100} = 165$$

$$x \left(\frac{110}{100} \right) = 165$$

$$x = \frac{165 \times 100}{110}$$

$$x = 150$$

Sale price of set = 150/-

(16)

List price of bicycle = 'x'

$$\text{VAT} = 10\% \text{ of } x = \frac{10}{100} x$$

∴ purchases a bicycle for Rs 660

$$x + \frac{10}{100} x = 660$$



$$x \left(\frac{116}{100} \right) = \frac{660}{1}$$

$$x = 600$$

List price of bicycle = 600/-

(17) Let 'x' be list price of television

$$\text{VAT} = 8\% \text{ of } x$$

$$= \frac{8}{100} x$$

$$\text{Total price} = x + \frac{8}{100} x$$

$$\frac{108}{100} x = 12500$$

$$x = 12500 \text{/-}$$

$\therefore$ list price of television = 12500

(18) Given Marked price Rs 210,000

$$\text{discount} = 5\%$$

$$\frac{\text{M.p} - \text{S.p}}{\text{M.p}} = \frac{5}{100}$$

$$\text{S.p} = \text{M.p} \left(1 - \frac{5}{100} \right)$$

$$\text{S.p} = \frac{95}{100} \times 210,000$$

$$\text{S.p} = 199500$$

$$\text{VAT} = 10\% \text{ on S.p}$$

$$= \frac{10}{100} \times 199500 = 19950$$



Total cost Shikha had to pay for purchasing the car =

$$\begin{array}{r} 199500 \\ + 19950 \\ \hline 219450 \end{array}$$

(19) let 'x' be price of cosmetic

$$\text{VAT} = \frac{15}{100} x$$

$$\therefore \left(x + \frac{15}{100} x \right) = 345$$

$$x = \frac{345 \times 100}{115}$$

$$x = 300$$

let y be price of purse

$$\text{VAT} = \frac{10}{100} y$$

$$\left(y + \frac{10}{100} y \right) = 110$$

$$y = \frac{110 \times 100}{110} = 100$$

$$\begin{aligned} \text{Total Cost excluding VAT} &= 300 + 100 \\ &= 400 \end{aligned}$$

let 3% be VAT percentage

$$400 + \left(\frac{3}{100} \times 400 \right) = (345 + 110)$$

$$3 = \frac{55}{4} = 13.75$$

$$\text{VAT on whole transaction} = 13.75 \%$$



(20)

Let 'x' be buying price of Customer excluding

VAT

$$\therefore \text{VAT} = \frac{10}{100} x$$

$$\therefore x + \frac{1}{10} x = 2563$$

$$x = \frac{2563 \times 10}{11}$$

$$x = 2330$$

but List price of Cooler = 2563

$$\begin{aligned} \text{Discount in price} &= 2563 - 2330 \\ &= 233 \end{aligned}$$

(21)

List price of washing machine = 9000

and discount = 5%

$$\text{Selling price} = \frac{95}{100} \times 9000$$

$$= 8550$$

$$\text{VAT} = 10\% \text{ of } 8550$$

$$= \frac{10}{100} \times 8550 = 855$$

Total money customer has to pay

$$= 8550 + 855$$

$$= 9405/-$$