13. Profit, Loss, Discount and Value Added Tax (VAT)

Exercise 13.1

1. Question

A student buys a pen for Rs 90 and sells it for Rs 100. Find his gain and gain percent.

Answer

Cost price of pen = Rs. 90

Selling price of pen = Rs. 100

Hence,

Gain = selling price – cost price = 100 – 90 = Rs. 10

Gain% = $\frac{gain}{cost\ price} \times 100 = \frac{10}{90} \times 100 = \frac{100}{9} = 11\frac{1}{9}\%$

2. Question

Rekha bought a saree for Rs 1240 and sold it for Rs 1147. Find her loss and loss percent.

Answer

Cost price of saree = Rs.1240

Selling piece of saree = Rs.1147

Loss = cost price – selling price = 1240 – 1147 = Rs. 93

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

3. Question

A boy buys 9 apples for Rs 9.60 and sells them at 11 for Rs 12. Find his gain or loss percent.

Answer

Cost price of 9 apples = Rs.9.60

∴ cost price of 1 apple = Rs. $\frac{9.60}{9}$

Selling price of 11 apple = Rs. 12

∴ selling price of 1 apple = Rs. $\frac{12}{11}$

Gain = $\frac{12}{11} - \frac{9.60}{9} = \frac{108-105.60}{99} = Rs.\frac{2.40}{99}$

$= Gain\% = \frac{gain}{cost\ price} \times 100 = \frac{\frac{2.40}{99}}{\frac{9.60}{9}} \times 100 = \frac{25}{11} = 2\frac{3}{11}\%$

4. Question

The cost price of 10 articles is equal to the selling price of 9 articles. Find the profit percent.

Answer

Cost price of 10 article = selling price of 9 article

Let CP of 1 article = Rs. X

Selling price of 9 article = 10X

Selling price of 1 article = $\frac{10x}{9}$

Hence,

Profit = $\frac{10x}{9} - x = \frac{x}{9}$

= $Gain\% = \frac{gain}{cost\,price} \times 100 = \frac{\frac{x}{9}}{x} \times 100 = 11\frac{1}{9}\%$

5. Question

A retailer buys a radio for Rs 225. His overhead expenses are Rs 15. If he sells the radio for Rs 300, determine his profit percent.

Answer

Cost price of radio = Rs.225

Overhead expenses = Rs. 15

Total cost = cost price + overhead expenses = 225+15 = Rs. 240

Selling price of radio = Rs.300

Gain = 300 – 240 = Rs. 60

= $Gain\% = \frac{gain}{cost\,price} \times 100 = \frac{60}{240} \times 100 = 25\%$

6. Question

A retailer buys a cooler for Rs 1200 and overhead expenses on it are Rs 40. If the coller for Rs 1550, determine his profit percent.

Answer

Cost price of cooler = Rs.1200

Overhead expenses = Rs. 40

Total cost = 1200+40 = Rs. 1240

Selling price of cooler = Rs.1550

Gain = 1550 - 1240 = Rs.310

= $Gain\% = \frac{gain}{cost\,price} \times 100 = \frac{310}{1240} \times 100 = 25\%$

7. Question

A dealer buys a wristwatch for Rs 225 and spends Rs 15 on its repairs. If he sells the same for Rs 300, find his profit percent.

Answer

Cost price of wrist watch = Rs.225

Cost of repairing = Rs.15

Total cost = Rs. 225+15 = Rs.240

Selling price of watch = Rs. 300

Gain = Rs. 300-240 = Rs.60

= $Gain\% = \frac{gain}{cost\,price} \times 100 = \frac{60}{240} \times 100 = 25\%$

8. Question

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.

Answer

Cost price of two boxes = Rs. 1300

Let cost price of one box = Rs. X

∴ Cost price of other box = Rs. 1300 – x

Selling price of first box = $x + x\times\frac{20}{100} = x + \frac{x}{5} = Rs.\frac{6x}{5}$

Selling price of second box = $(1300 - x) - (1300 - x)\times\frac{12}{100} = Rs.\frac{28600-22x}{25}$

We have,

$= \frac{6x}{5} = \frac{28600-22x}{25}$

$= 150x = 28600\times5 - 110x$

$= x = \frac{28600\times5}{260} = 550$

Hence,

Cost price of first box = Rs. 550

Cost price of second box = 1300 – 550 = Rs. 750

9. Question

If theselling price of 10 pens is equal to cost price of 14 pens, find the gain percent.

Answer

Selling price of 10 pens = cost price of 14 pens

Let cost price of 1 pen = Rs. X

Selling price of 10 pens = Rs.14X

Selling price of 1 pen =Rs. $\frac{14X}{10}$

Gain = $\frac{14X}{10} - X = \frac{4X}{10}$

$= \frac{SP}{CP} = \frac{14}{10} \ldots\ldots(i)$

$= Gain\% = \frac{gain}{cost\,price}\times100 = \frac{\frac{4X}{10}}{X}\times100 = \frac{2}{5}\times100 = 40\%$

10. Question

If the selling price of 18 chairs be equal to selling price of 16 chairs, find the gain or loss percent.

Answer

Cost price of 18 chairs = selling price of 16 chairs

Let cost price of 1 chair = Rs. X

Selling price of 16 chairs =Rs. 18X

Selling price of 1 chair = Rs. $\frac{18X}{16}$

Gain = $\frac{18X}{16} - x = \frac{2x}{16} = Rs.\frac{x}{8}$

$= Gain\% = \frac{gain}{cost\,price}\times100 = \frac{\frac{x}{8}}{x}\times100 = \frac{25}{2} = 12\frac{1}{2}\%$

11. Question

If the selling price of 18 oranges is equal to the cost price of 16 oranges, find the loss percent.

Answer

Selling price of 18 oranges = cost price of 16 oranges

Let cost price of 1 orange = Rs. X

Selling price of 18 oranges = Rs. 16X

∴selling price of 1 orange = $Rs.\frac{16X}{18}$

Loss = $X-\frac{16X}{18}=Rs.\frac{2x}{18}=Rs.\frac{X}{9}$

= $loss\%=\frac{loss}{cost\ price}\times100=\frac{\frac{x}{9}}{x}\times100=\frac{1}{9}\times100=11\frac{1}{9}\%$

12. Question

Ravish sold his motorcycle to Vineet at a loss of 28%. Vineet spent Rs 1680 on its repairs and sold the motor cycle to Rahul for Rs 35910, thereby making a profit of 12.5%, find the cost price of the motor cycle for Ravish.

Answer

Let cost price of motorcycle for ravish = Rs. X

Loss% for ravish = 28%

Selling price for Ravish = $x-x\times\frac{28}{100}=Rs.\frac{18x}{25}$

Selling price for Ravish = cost price for vineet = $Rs.\frac{18x}{25}$

Cost of repairing by vineet = Rs.1680

Total cost for vineet = $\frac{18x}{25}+1680\,rs.$

Selling price for vineet = Rs. 35910

Profit = $35910-\frac{18x+42000}{25}=Rs.\frac{855750-18x}{25}$

Profit percentage = 12.5% Given

Hence, by formula

= $Gain\%=\frac{gain}{cost\ price}\times100\ =\frac{\left[\frac{855750-18x}{25}\right]}{\left[\frac{18x+42000}{25}\right]}\times100=12.5$

= $\frac{\left[\frac{855750-18x}{25}\right]}{\left[\frac{18x+42000}{25}\right]}=\frac{125}{1000}=\frac{1}{8}$

= 162x = 6804000

= $x=\frac{6804000}{162}=42000$

∴ cost price of motorcycle for Ravish = Rs.42000

13. Question

By selling a book for Rs 258, a bookseller gains 20%. For how much should he sell it to gain 30%?

Answer

Selling price of book = Rs.258

Gain% = 20

Let cost price of book = Rs. X

So,

$= x + x \times \frac{20}{100} = 258$

$= x + \frac{x}{5} = \frac{6x}{5} = 258$

$= x = \frac{258 \times 5}{6} = 215$

Cost price of book = Rs. 215

For a gain 30% he must sold the book at = $215 + 215 \times \frac{30}{100} = Rs.279.50$

14. Question

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

Answer

Cost price of briefcase = Rs. 800

loss% = 8%

selling price of box = $800 - 800 \times \frac{8}{100} = 800 - 64 = Rs.736$

it is further reduced by 5% (Given)

New selling price = $736 - 736 \times \frac{5}{100} = Rs.699.20$

15. Question

By selling 90 ball pens for Rs 160 a person loses 20%. How many ball pens should be sold for rs 96 so as to have profit of 20%?

Answer

Selling price of 90 ball pens = Rs. 160

Selling price of 1 ball pen = Rs. $\frac{160}{90} = Rs.\frac{16}{9}$

Loss% = 20%

Let cost price of 1 pen = Rs. X

So, $x - x \times \frac{20}{100} = \frac{16}{9}$

$= \frac{4x}{5} = \frac{16}{9}$, $= x = Rs.\frac{20}{9}$

Cost price of 1 ball pen = Rs.$\frac{20}{9}$

To get profit of 20%...

Let no.of pens = x

Selling price of x pens = Rs. 96

Selling price of 1 pen = Rs.$\frac{96}{x}$

By formula ,

$= Gain\% = \frac{gain}{cost\,price} \times 100$

$= 20 = \frac{\frac{96}{x} - \frac{20}{9}}{\frac{20}{9}} \times 100$

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

= x = 36

Hence,

Number of ball pens can be purchased = 36.

16. Question

A man sells an article at a profit of 25%. If he had bought it at 20% less and sold it for Rs 36.75 less, he would have gained 30%. Find the cost price of the article.

Answer

Let the cost price of article = Rs. X

Profit% = 25%

Selling price of article = $x + x \times \frac{25}{100} = x + \frac{x}{4} = Rs.\frac{5x}{4}$

If CP of article is 20% less (given)

Now CP becomes = $x - x \times \frac{20}{100} = Rs.\frac{4x}{5}$

Now SP = $\frac{5x}{4} - 36.75$

Profit % = 30%

By formula,

$= Gain\% = \frac{gain}{cost\,price} \times 100$

$= 30 = \frac{\left[\left(\frac{5x}{4} - 36.75\right) - \frac{4x}{5}\right]}{\frac{4x}{5}} \times 100$

$= \frac{30}{100} \times \frac{5}{4x} = \frac{5x-147}{4} - \frac{4x}{5}$

$= \frac{3}{8x} = \frac{25x-588-16x}{20} = x = 175$

Cost price of article = Rs.175

17. Question

A dishonest shopkeeper professes to sell pulses at his cost price but uses a false weight of 950 gm for each kilogram. Find his gain percent.

Answer

Let cost price of 1000gm pulses = Rs.x

But, SP of 950 gm pulses = Rs.x

∴ SP of 1000 gm pulses = $1000 \times \frac{x}{950}$

Gain = $\frac{1000x}{950} - x = \frac{50x}{950}$

Gain% = $\frac{\frac{50x}{950}}{x} \times 100 = \frac{100}{19} = 5\frac{5}{19}\%$

18. Question

A dealer bought two tables for Rs 3120. He sold one of them at loss of 15% and other at a gain of 36%. Then, he found that each table was sould for the same price. Find the cost price of each table.

Answer

Cost price of 2 tables = Rs.3120

Let CP of first table = Rs. X

Then, CP of second table would be = Rs. 3120 – x

Let first table is sold at a gain and second at loss.

Selling price of first table = $x + x \times \frac{36}{100} = x + \frac{9x}{25} = Rs.\frac{34x}{25}$

Selling price of second table = $(3120 - x) \times \frac{85}{100} = Rs.\frac{85 \times 3120 - 85x}{100}$

We have,

$= \frac{34x}{25} = \frac{85 \times 3120 - 85x}{100}$

$=221x = 85 \times 3120$

$= x = \frac{85 \times 3120}{221} = 1920$

Cost price of first table = Rs.1920

Cost price of second table = 3120 – 1920 = Rs.1200

19. Question

Mariam bought two fans for Rs 3605. She sold one at a profit of 15% and the other at a loss of 9%. If Mariam obtained the same amount for each fan, find the cost price of each fan.

Answer

Cost price of 2 fans = Rs.3605

let cost price of 1 fan = Rs.x

then CP of other fan would be = Rs. 3605 – x

let first fan is sold at profit and second at a loss.

Selling price of first fan = $x + x \times \frac{15}{100} = Rs.\frac{23x}{20}$

Selling price of second fan = $3605 - x) \times \frac{91}{100} = Rs.\frac{91 \times 3605 - 91x}{100}$

We have ,

$= \frac{23x}{20} = \frac{91 \times 3605 - 91x}{100}$

$= 115x + 91x = 91 \times 3605$

$= x = \frac{91 \times 3605}{206} = 1592.50$

Cost price of one fan = Rs.1592.50

Cost price of second fan = 3605 – 1592.50 = Rs.2012.50

20. Question

Some toffees are bought at the rate of 11 for Rs 10 and the same number at the rate of 9 for Rs 10. If the whole lot is sold at one rupee per toffee, find the gain or loss percent on the whole transaction.

Answer

In set (i)

CP of 11 toffees = Rs.10

CP of 1 toffee = Rs. $\frac{10}{11}$

In set (ii)

CP of 9 toffees = Rs.10

CP of 1 toffee = Rs.$\frac{10}{9}$

After mixing both sets ....

CP of 2 toffees = $Rs.\left(\frac{10}{11}+\frac{10}{9}\right)=Rs.\frac{200}{99}$

CP of 1 toffee = Rs. $\frac{200}{198}$

SP of 1 toffee = Rs. $1\ Given$

Loss = $\frac{200}{198}-1=Rs.\frac{2}{198}$

= $loss\%=\frac{loss}{cost\ price}\times100=\frac{\frac{2}{198}}{\frac{200}{198}}\times100=1\%$

21. Question

A tricycle is slold at a gain of 16%. Had it been sold for Rs 100 more, the gain would have been 20%. Find the C.P. of the tricycle.

Answer

Let CP of tricycle = Rs.x

Gain% = 16%

Selling price of tricycle = $x+x\times\frac{16}{100}=\frac{116x}{100}=\frac{29x}{25}$

If selling price is Rs. 100 more

Gain = 20%

= 20 = $\frac{\left[\left(\frac{29x}{25}+100\right)-x\right]}{x}\times100$

= $\frac{20x}{100}=\frac{29x+2500-25x}{25}$

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

= x = $\frac{100\times100}{4}=2500$

∴CP of tricycle = Rs.2500

22. Question

Shabana bought 16 dozen ball bens and sold them at a loss equal to S.P. of 8 ball pens. Find

(i) her loss percent

(ii) S.P. of 1 dozen ball pens, if she purchased these 16 dozen ball pens for Rs 576.

Answer

She bought 16 dozen ball pen

Loss for 16 dozen pen = SP of 8 ball pen

Let CP of each pen = Rs. X

CP of 16 dozen ball pen = 16×12× x

= loss = 8SP

= 16×12× x = 16×12× SP = 8SP

= 16×12× x = 200 SP

= SP = $\frac{192}{200}x$

Loss% = $\frac{x-\frac{192}{200}x}{x}\times 100 = \frac{8}{2} = 4\%$

If CP of 16 dozen ball pen = RS.576

= 16×12× x= 576

= x = $\frac{576}{16\times12}$

Selling price of one pen = $\frac{192}{200}x$

Selling price of dozen pen = $12\times\frac{192}{200}\times\frac{576}{16\times12} = RS.34.56$

23. Question

The difference between two selling prices of a shirt at profits of 4% and 5% is Rs 6.

(i) C.P. of the shirt

(ii) The two selling prices of the shirt

Answer

Case 1 :

Cost Price = x

Profit = $\frac{4}{100}\ of\ C.P. = \frac{4x}{100}$

Selling Price = C.P. + Profit = $\frac{x+4x}{100} = \frac{104x}{100}$

Case 2:

Cost Price = x

Profit = $\frac{5}{100}\ of\ C.P. = \frac{5x}{100}$

Selling Price = C.P. + Profit = $\frac{x+5x}{100}$

Given that, the difference between the profits is Rs. 6

Therefore, $\frac{x+4x}{100} - \frac{x+5x}{100} = 6$

$\frac{x}{100}$ = 600

So,

C.P. = Rs. 600

Selling Price of shirt 1 = $\frac{104x}{100} = \frac{104\times600}{100}$ = Rs 624

Selling Price of shirt 2 = $\frac{105x}{100} = \frac{105\times600}{100}$ = Rs 630

24. Question

Toshiba bought 100 hens for Rs 8000 and sold 20 of these at a gain of 5%. At what gain percent she must sell the remaining hens so as to gain 20% on the whole?

Answer

Toshiba bought one hen for $\frac{8000}{100}$ = 80 each.gain of 5% on 80 = (1.05×80) = 84 eachor (20×84) = 1680 totalshe want a total of 20% gain on 8000 =(1.2×8000) = 9600 totalshe need to make 9600 - 1680 = 7920 total on the last 80 hens.she originally paid (80×80) = 6400 for those hens.= $\frac{7920}{6400}$ = 1.2375

so she need 23.75% gain on the remaining hens

Exercise 13.2

1. Question

Find the S.P. if

(i) M.P. = Rs. 1300 and Discount = 10%

(ii) M.P. = Rs. 500 and Discount = 15%

Answer

(i) Given,

M.P. = 1300

Discount = 10%

$$\frac{discount}{M.P.}\times100$$

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

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

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

$$S.P. = \frac{90}{100}\times1300 = 1170/-$$

(ii) Given,

M.P. = 500

Discount = 15%

$$\frac{M.P. - S.P.}{M.P.}\times100 = 15$$

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

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

$S.P. = 500 \times \frac{85}{100} = 425/-$

2. Question

Find the M.P., if

(i) S.P. = Rs. 1222 and Discount = 6%

(ii) S.P. = Rs. 495 and Discount = 1%

Answer

(i) Given,

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) Given,

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. Question

Find the discount in percent when

(i) M.P. = Rs. 900 and S.P. = Rs. 873

(ii) M.P. = Rs. 500 and S.P. = Rs. 425

Answer

(i) Given,

M.P. = Rs. 900

S.P. = Rs. 873

Discount = M.P. – S.P.

= 900 – 873

= 27

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

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

(ii) Given,

M.P. = Rs. 500

S.P. = Rs. 425

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

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

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

4. Question

A shop selling sewing machines offers 3% discount on all cash purchases. What cash amount does a customer pay for a sewing machine the price of which is marked as Rs. 650.

Answer

Given,

Marked Price = Rs 650/-

Discount = 3%

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

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

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

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

Customer has to pay = 630.50/-

5. Question

The marked price of a ceiling fan is Rs. 720. During off season, it is sold for Rs. 684. Determine the discount percent.

Answer

Given,

Marked price = 720

Selling price = 684

Discount = M.P. – S.P.

= 720 - 684 = 36

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

$= \frac{36}{720} \times 100 = 5\%$

Discount = 5%

6. Question

On the eve of Gandhi Jayanti a saree is sold for Rs. 720 after allowing 20% discount. What is its marked price?

Answer

Given,

Saree is sold for Rs 720 = S.P.

Discount = 20%

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

$$\frac{20}{100} M.P. = M.P. - 720$$

$720 = \frac{80}{100} M.P.$

$M.P. = \frac{720 \times 100}{80} = 900$

M.P. = 900

7. Question

After allowing a discount of $7\frac{1}{2}\%$ on the marked price, an article is sold for Rs. 555. Find its marked price.

Answer

Given,

Discount = $7\frac{1}{2}\% = \frac{15}{2}\%$

S.P. = 555 Rs

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

$$\left(\frac{\frac{15}{2}}{100} \right) = \frac{M.P. - S.P.}{M.P.}$$

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

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

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

M.P. = 600/-

8. Question

A shopkeeper allows his customers 10% off on the marked price of goods and still gets a profit of 25%. What is the actual cost to him of an article marked Rs. 250?

Answer

Given,

10% off on marked price of goods

So,

Discount = 10%

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

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

$\frac{25}{100} C.P.$ = S.P. – C.P.

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

C.P. = $\frac{225 \times 100}{125}$

C.P. = 180/-

9. Question

A shopkeeper allows 20% off on the marked price of goods and still gets a profit of 25%. What is the actual cost to him of an article marked Rs. 500?

Answer

Given,

M.P. = 500

Discount = 20%

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

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

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

He gets the profit of 25%

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

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

$$CP = \frac{100}{125} \times 400$$

C.P. = 320

So, he gets the article for Rs 320/-

10. Question

A tradesman marks his goods at such a price that after allowing a discount of 15%, he makes a profit of 20%. What is the marked price of an article whose cost price is Rs. 170?

Answer

Given,

C.P. of the article = 170 Rs.

Profit = 20%

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

$$SP = \frac{120}{100} \times CP$$

$$SP = \frac{120}{100} \times 170$$

S.P. = 204

And discount = 15%

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

$\frac{15}{100} M.P.$ = M.P. – S.P.

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

M.P. = $\frac{100 \times 204}{85}$ = 240

M.P. = 240/-

11. Question

A shopkeeper marks his goods in such a way that after allowing a discount of 25% on the marked price, he still makes a profit of 50%. Find the ratio of the C.P. to the M.P.

Answer

Given,

Discount = 25%

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

$\frac{25}{100} M.P$ = M.P. – S.P.

$$S.P. = \frac{75}{100} M.P. \text{ ....(i)}$$

And given profit = 50%

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

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

$$S.P. = \frac{150}{100} C.P. \text{ ....(ii)}$$

We know (i) = (ii)

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

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

Ratio C.P. to M.P. = 1:2

12. Question

A cycle dealer offers a discount of 10% and still makes a profit of 26%. What is the actual cost to him of a cycle whose marked price is Rs. 840?

Answer

Given,

Marked price on cycle = 840

Discount = 10%

S.P. of cycle = $\frac{90}{100} \times 840 = 756$/-

Profit = 26%

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

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

C.P. = 600/-

13. Question

A shopkeeper allows 23% commission in his advertised price and still makes a profit of 10%. If he gains Rs. 56 on one item, find his advertised price.

Answer

Let advertised price be X

Commission is 23% on advertised price

Selling price = $\frac{77}{100}x$ ...(i)

Given profit = 56

Profit % = 10

$$\frac{10}{100} = \frac{profit}{C.P.}$$

C.P. = 560

Profit = S.P. – C.P. = 56

S.P. = 560+56

S.P. = 616/-

From equation (i)

$$\frac{77}{100}x = 616$$

$$x = \frac{61600}{77} = 800$$

X = 800/-

14. Question

A shopkeeper marked his goods at 40% above the cost price but allows a discount of 5% for cash payment to his customers. What actual profit does he make, if he receive Rs. 1064 after pating the discount?

Answer

Given,

Shopkeeper marks his goods at 40% above the cost price.

Let cost price e 'X'

Marked price is $\frac{140}{100}x$ (40 more than 100 if CP is 100)

Discount on marked price is 5%

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

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

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

Given S.P. = 1064

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

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

X = 800

Cost price is 800

Selling price is 1064

Profit will be = 1064 – 800 = 264/-

15. Question

By selling a pair of earings at a discount of 25% on the marked price, a jeweller makes a profit of 16%. If the profit is Rs. 48, what is the cost price? What is the marked price and the price at which the pair was eventually bought?

Answer

Given,

Earings are bought at 25% discount

Profit of seller = 16%

$$\frac{16}{100} = \frac{profit}{CP}$$

$$C.P. = \frac{48 \times 100}{16}$$

C.P. = 200

Cost price of ear ring = 300/-

And profit = 48

S.P. – C.P. = 48

S.P. = C.P. + 48

S.P. = 348

And given discount = 25%

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

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

$$MP = \frac{100 \times 348}{75} = 464$$

So, marked price = 464/-

16. Question

A publisher gives 32% discount on the printed price of a book to booksellers. What does a book seller pay for a book whose printed price is Rs. 275?

Answer

Given,

Printed price = 275

Discount = 32%

We have

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

32 $= \left(\frac{275 - S.P.}{275}\right) \times 100$

$$\frac{32}{100} \times 275 = 275 - S.P.$$

$$SP = 275 - \frac{32}{100} \times 275$$

S.P. = 187/-

Book Seller should pay = 187/-

17. Question

After allowing a discount of 20% on the marked price of a lamp, a trader loses 10%. By what percentage is the marked price above the cost price?

Answer

Given,

Discount = 20%

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

S.P. $= \frac{80}{100} M.P.$ ...(i)

And trader lose is 10%

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

$S.P. = \frac{90}{100} C.P.$ ...(ii)

We have to find out % of marked price above cost price

$$\frac{M.P.-C.P.}{C.P.}\times 100=\frac{\left(\frac{100}{80}\right)S.P.-\left(\frac{100}{90}\right)S.P.}{\left(\frac{100}{90}\right)S.P.}\times 100$$

$$=\frac{\left(\frac{100}{80}\right)-\left(\frac{100}{90}\right)}{\left(\frac{100}{90}\right)}\times 100$$

$$=\frac{100\left(\frac{90-80}{90\times 80}\right)\times 90}{100}\times 100$$

$$=\frac{1000}{80}=12.5\%$$

% of marked price above cost price = 12.5%

18. Question

The list price of a table fan is Rs. 480 and it is available to a retailer at 25% discount. For how much should a retailer sell it to gain 15%?

Answer

Given,

List price of table fan = Rs 480

M.P. = 480

Retailer buys it at discount 25%

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

C.P. = $\left(\frac{75}{100}\right)\times 480$

C.P. = 36

Retails sells it to get 15%

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

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

S.P. = $\frac{115}{100}\times 360=414$

S.P. = 414

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

19. Question

Rohit buys items at 25% discount on the marked price. He sells it for Rs. 660, making a profit of 10%. What is the marked price of the item?

Answer

Given,

S.P. of item by Rohit = 660

10% profit

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

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

$$CP = \frac{100}{110} \times 660 = 600$$

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

This is the selling price for shopkeeper

He offers 25% discount

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

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

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

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

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

MP = 800/-

20. Question

A cycle merchant allows 20% discount on the marked price of the cycles and still makes a profit of 20%. If he gains Rs. 360 over the sale of one cycle, find the marked price of the cycle.

Answer

Given,

Gain on one cycle = Rs.360

Gain = 20%

Gain % = $\frac{gain}{CP} \times 100$

= 20 = $\frac{300}{CP} \times 100$

= CP = Rs. 1800

Selling price = $\frac{100 + gain\%}{100} \times CP = \frac{120}{100} \times 1800 = Rs. 2160$

DISCOUNT = 20% Given

Hence,

Marked price = $\frac{100 \times SP}{100 - D\%} = \frac{100 \times 2160}{80} = Rs. 2700$

Marked price of one cycle = Rs.2700

21. Question

Jyoti and Meena run a ready-made garment shop. They mark the garments at such a price that even after allowing a discount of 12.5%, they make a profit of 10%. Find the marked price of a suit which costs them Rs. 1470.

Answer

Given,

CP of suit = Rs.1470

Gain = 10%

So,

SP = Rs.$\frac{100+Gain}{100} \times CP = \frac{110}{100} \times 1470 = Rs.1617$

Discount = 12.5%

So,

MP= Rs. $\left(\frac{100 \times SP}{100-D\%}\right) = Rs.\left(\frac{100 \times 1617}{100-12.5}\right) = Rs.1848$

The marked price of suit = Rs.1848

22. Question

What price should Aslam mark on a pair of shoes which costs him Rs. 1200 so as to gain 12% after allowing a discount of 16%?

Answer

Given,

CP of pair of shoes = Rs.1470

Gain = 12%

Discount = 16%

So,

SP = Rs. $\frac{100+gain\%}{100} \times CP = Rs.\frac{112}{100} \times 1200 = Rs.1344$

Now,

Selling price = Rs.1344

Discount = 16%

So,

MP = Rs. $\left(\frac{100 \times SP}{100-discount\ \%}\right) = Rs.\left(\frac{100 \times 1344}{100-16}\right) = Rs.1600$

Aslam should sell the pair of shoes = Rs.1600

23. Question

Jasmine allows 4% discount on the marked price of her goods and still earns a profit of 20%. What is the cost price of a shirt for her marked at Rs. 850?

Answer

Given,

MP of the shirt = Rs. 850

Discount = 4 %

Discount allowed = $\frac{4}{100} \times 850 = Rs.34$

So,

Selling price of shirt = Rs.(850 – 34) = Rs.816

Profit earned by Jasmine = 20%

CP = $\frac{100 \times SP}{100+PROFIT\%} = Rs.\frac{100 \times 816}{100+20} = Rs.680$

Cost price of shirt = Rs.680

24. Question

A shopkeeper offers 10% off-season discount to the customers and still makes a profit of 26%. What is the cost price for the shopkeeper on a pair of shoes marked at Rs. 1120?

Answer

Given,

MP of pair of shoes = Rs.1120

Discount = 10%

So,

SP = MP $\left(\frac{100-Discount\%}{100}\right) = 1120\times\frac{90}{100} = Rs.1008$

Profit = 26%

SP = Rs.1008

Hence,

CP = $\left(\frac{100\times SP}{100+profit\%}\right) = \left(\frac{100\times1008}{100+26}\right) = Rs.800$

Cost price of the pair of shoes = Rs.800

25. Question

A lady shopkeeper allows her customers 10% discount on the marked price of the goods and still gets a profit of 25%. What is the cost price of a fan for her marked at Rs. 1250

Answer

Given,

MP of the fan = Rs.1250

Discount = 10%

So,

Discount = $\frac{10}{100}\times1250 = Rs.125$

We know that,

SP = MP – Discount = Rs.(1250 – 125) = Rs.1125

Now,

SP of fan = Rs.1125

Profit = 25%

CP = $\left[\frac{100}{100+profit\%}\times SP\right] = \frac{100}{125}\times1125 = Rs.900$

The cost price of fan = Rs. 900

Exercise 13.3

1. Question

The list price of a refrigerator is Rs. 9700. If a value added tax of 6% is to be charged on it, how much one has to pay to buy the refrigerator?

Answer

Given,

List price of refrigerator = Rs.9700

VAT = 6%

So,

Vat = 6% of 9700 = $\frac{6}{100} \times 9700 = Rs.582$

Total amount one has to pay = Rs.(9700 + 582) = Rs. 10282

2. Question

Vikram bought a watch for Rs. 825. If this amount includes 10% VAT on the list prices. What was the list price of the watch?

Answer

Given,

VAT =10%

Let list price of watch = Rs. X

Total price of watch = $x + \frac{10x}{100}$

Vikram bought watch for Rs. 825

Hence,

$= x + \frac{10x}{100} = 825$

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

$= x = \frac{825 \times 10}{11} = Rs.750$

List price of watch = Rs.750

3. Question

Aman bought a shirt for Rs. 374.50 which includes 7% VAT. Find the list price of the shirt.

Answer

Given,

VAT = 7%

Let list price of shirt = Rs. X

So,

$= x + \frac{7x}{100} = 374.50$

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

$= x = \frac{374.50 \times 100}{107} = Rs.350$

Hence,

List price of shirt = Rs.350

4. Question

Rani purchases a pair of shoes whose sale price is Rs. 175. If she pays VAT at the rate of 7%, how much amount does she pay as VAT? Also, find the net value of the pair of shoes.

Answer

Given,

Sale price of shoes = Rs.175

VAT = 7%

= 7% of 175 = $175 \times \frac{7}{100} = Rs.12.25$

∴ Net value of pair of shoes = sale price +VAT

= 175 + 12.25 = Rs.187.25

5. Question

Swarna paid Rs. 20 as VAT on a pair of shoes worth Rs. 250. Find the rate of VAT.

Answer

Given,

List price of shoes = Rs.250

Let VAT = X %

= X% of 250=20.....Given

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

Hence,

VAT = 8%

6. Question

Sarita buys goods worth Rs. 5500. She gets a rebate of 5% on it. After getting the rebate if VAT at the rate of 5% is charged, find the amount she will have to pay for the goods.

Answer

Given,

Price of goods = Rs.5500

Discount = 5%

So,

Selling price = $5500 \times \frac{95}{100} = Rs.5225$

And,

VAT = 5% of selling price

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

Amount $to\ be\ paid\ for\ the\ goods = Rs.(5225 + 261.25) = Rs.5486.25$

7. Question

The cost of furniture inclusive of VAT is Rs. 7150. If the rate of VAT is 10%, find the original cost of the furniture.

Answer

Given,

Cost of furniture inclusive VAT = Rs.7150

VAT = 10%

Let the original cost of furniture = Rs. X

So,

$=x+\frac{10x}{100}=7150$

$=x\left(\frac{11}{10}\right)=7150$

$=x=\frac{7150\times10}{11}=Rs.6500$

Hence,

Original cost of furniture = Rs. 6500

8. Question

A refrigerator is available for Rs. 13750 including VAT. If the rate of VAT is 10%, find the original cost of the refrigerator.

Answer

Given,

Cost of refrigerator inclusive VAT = Rs.13750

Rate of VAT = 10%

So,

$=x+\frac{10x}{100}=13750$

$=\left(\frac{11}{10}\right)x=13750$

$=x=\frac{13750\times10}{11}=Rs.12500$

Hence,

Original cost of furniture = Rs.12500

9. Question

A colour T.V. is available for Rs. 13440 inclusive of VAT. If the original cost of TV is Rs. 12000, find the rate of VAT.

Answer

Given,

Cost of TV including VAT = RS.13440

Original cost = Rs.12000

Let rate of VAT = x%

So,

$=x\%of\ 12000+12000=13440$

$=120x=13440-12000=1440$

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

Hence,

Rate of VAT = 12%

10. Question

Reena goes to ashop to buy a radio, costing Rs. 2568. The rate of VAT is 7%. She tells the shopkeeper to reduce the price of the radio such that she has to pay Rs. 2568, inclusive of VAT. Find the reduction needed in the price of radio.

Answer

Given,

Cost of radio = Rs.2568

Rate of VAT = 7%

Let the reduced price, excluding VAT of the radio = Rs.X

= VAT = 7 % of Rs. X = Rs.$\frac{7x}{100}$

Hence,

Selling price of radio = Rs. $x + \frac{7x}{100} = \frac{107x}{100}$

Selling price = Rs.2568.....Given

So,

$= \frac{107x}{100} = 2568$

$= x = \frac{2568 \times 100}{107} = Rs.2400$

Reduction needed in price of radio = Rs.(2568 – 2400) = Rs.168

11. Question

Rajat goes to a departmental store and buys the following articles:

Item	Price per item	Rate of VAT
2 Pairs of shoes	Rs. 800	5%
1 Sewing machine	Rs. 1500	6%
2 Tes-Sets	Rs. 650	4%

Calculate the total amount he has to pay to the store.

Answer

Given,

CP of 2 pair of shoes = Rs.800×2 = Rs.1600

Rate of VAT = 5%

So,

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

∴ Amount Rajat need to pay for 2 pair of shoes = Rs.(1600+80) = Rs.1680

CP of 1 sewing machine = Rs.1500

Rate of VAT = 6%

= 6% of 1500 = $\frac{6}{100} \times 1500 = Rs.90$

∴ Amount Rajat needs to pay for 1 sewing machine = Rs.(1500+90) = Rs. 1590

Given

CP of 2 tea-sets = Rs.650 ×2 = Rs.1300

Rate of VAT = 4 %

= 4% of 1300 = $\frac{4}{100} \times 1300 = Rs.52$

∴ Amount Rajat needs to pay for 2 tea-sets = Rs.(1300+52) = Rs.1352

Hence,

Total amount Rajat needs to pay = Rs(1680+1590+1352) = Rs.4662

12. Question

Ajit buys a motorcycle for Rs. 17600 including value added tax. If the rate of VAT is 10%, what is the sale price of the motorcycle?

Answer

Given,

Rate of VAT = 10%

Cost of motorcycle including VAT = Rs. 17600

Let the sale price = Rs.X

= $x + \frac{10x}{100} = 17600$

= $\frac{11x}{10} = 17600$

= $x = \frac{17600 \times 10}{11} = Rs.16000$

Hence,

Sale price of motorcycle = Rs.16000

13. Question

Manoj buys a leather coat costing Rs. 900 at Rs. 990 after paying the VAT. Calaulate the rate of VAT chaged on the coat.

Answer

Given,

Let the rate of VAT = x%

So,

VAT = 900× $\frac{x}{100} = Rs.9x$

According to the question,

= 900 + 9x = 990

= 9x = 90

= x = 10

Hence,

Manoj was charged 10% VAT on leather jacket.

14. Question

Rakesh goes to a departmental store and purchases the following articles :

(i) biscuits and bakery products costing Rs. 50, VAT @ 5%

(ii) medicine costing Rs.90, VAT @ 10%

(iii) clothes costing Rs. 400, VAT @ 1% and

(iv) cosmetics costing Rs. 150, VAT @ 10%.

Calculate the total amount to be paid by Rakesh to the store.

Answer

(i) Given,

Cost of biscuits and bakery products = Rs. 50

VAT = 5%

So, VAT = 5% of 50 = $\frac{5}{100} \times 50 = Rs.\,2.50$

Total amount paid for biscuits and bakery products = Rs.(50+2.50) =Rs.52.50

(ii) Given,

Cost of medicine = Rs.90

VAT = 10%

So, VAT = 10% of 90 = $\frac{10}{100} \times 90 \ = Rs.\,9$

Total amount paid for medicines = Rs.(90+9) =Rs.99

(iii) Given,

Cost of clothes = Rs.400

VAT = 1%

So, VAT = 1% of 400 = $\frac{1}{100} \times 400 = Rs.\,4$

Total amount paid for clothes = Rs.(400+4) = Rs.404

(iv) Given,

Cost of cosmetics = Rs.150

VAT = 10%

So, VAT = 10% of 150 = $\frac{10}{100} \times 150 = Rs.\,15$

Total amount paid for cosmetics = Rs(150+15) = Rs.165

Hence,

Total amount Rakesh paid at departmental store = Rs.(52.50+99+404+165) =Rs.720.50

15. Question

Rajeeta purchased a set of cosmetics. She paid Rs. 165 for it including VAT. If the rate of VAT is 10%, find the sale price of the set.

Answer

Given,

Rate of VAT = 10%

Cost of set = Rs.165

Let sale price of set = Rs.X

$= x + \frac{10x}{100} = 165$

$= \frac{11x}{10} = 165$

$= x = \frac{165 \times 10}{11} = Rs.150$

Hence,

Sale price of set = Rs.150

16. Question

Sunita purchases a bicycle for Rs. 660. She has paid a VAT of 10%. Find the list price of the bicycle?

Answer

Given,

Rate of VAT = 10%

Cost of bicycle = Rs.660

Let sale price of bicycle = Rs.X

So,

$= \frac{11x}{10} = 660$

$= x = \frac{660 \times 10}{11} = Rs.600$

Hence,

List price of bicycle = Rs.600

17. Question

The sales price of a television, inclusive of VAT, is Rs. 13,500. If VAT is charged at the rate of 8% of the list price, find the list price of the television.

Answer

Given,

Let ‘x’ be list price of television

VAT = 8% of x

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

$total\ prie = x + \frac{8}{100}x$

$\frac{108}{100}x = 13500$

X = 12500/-

List price of television = 12500/-

18. Question

Shikha purchased a car with a marked price of Rs. 210000 at a discount of 5%. If VAT is charged at the rate of 10%, find the amount Shikha had paid for purchasing the car.

Answer

Given,

Marked price = Rs 210000

Discount = 5%

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

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

S.P. = $\frac{95}{100} \times 210000$

S.P. = 199500

VAT = 10% on S.P.

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

Total cost shikha has to pay for purchasing the Car = 199500 + 19950 = 219450 Rs

19. Question

Shruti bought a set of cosmetic items for Rs. 345 including 15% value added tax and a purse for Rs. 110 including 10% VAT. What percent is the VAT charged on the whole transaction?

Answer

Let x be the price of cosmetic

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

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

X = $\frac{345 \times 100}{115} = 300$

Let Y be the price of purse

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

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

Y = $110 \times \frac{10}{11} = 100$

Total cost excluding VAT = 300+100 = 400

Let 3% be VAT percentage

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

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

VAT on whole transaction = 13.75%

20. Question

List price of a cooler is Rs. 2563. The rate of VAT is 10%. The customer requests the shopkeeper to allow a discount in the price of the cooler to such an extent that the price remains Rs. 2563 inclusive of VAT. Find the discount in the price of the cooler.

Answer

Given,

Let X be the buying price of customer excluding VAT

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

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

X = $\frac{2563 \times 10}{11} = 2330$

X = 2330

But list price of cooler = 2563

Discount in price = 2563 – 2330 = 233

21. Question

List price of a washing machine is Rs. 9000. If the dealer allows a discount of 5% on the cash payment, how much money will a customer pay to the dealer in cash, if the rate of VAT is 10%?

Answer

Given,

List price of washing machine = 900

Discount = 5%

Selling price = $\frac{95}{100} \times 900 = 8550$

VAT = 10% of 8550

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

Total money customer has to pay = 8550+855 = 9405/-