

Profit and Loss

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INTRODUCTION

Nowadays, transactions have become a common feature of life. When a person deals in the purchase and sale of any item, he either gains or loses some amount generally. The aim of any business is to earn profit. The commonly used terms in dealing with questions involving sale and purchase are:

Cost Price: The cost price of an article is the price at which an article has been purchased. It is abbreviated as C.P.

Selling Price: The selling price of an article is the price at which an article has been sold. It is abbreviated as S.P.

Profit or Gain: If the selling price of an article is more than the cost price, there is a gain or profit.

Thus, Profit or Gain = S.P. – C.P.

Loss: If the cost price of an article is greater than the selling price, the seller suffers a loss.

Thus, Loss = C.P. – S.P.

Note that profit and loss are always calculated with respect to the cost price of the item.

Illustration 1: (i) If C.P. = ₹235, S.P. = ₹240, then profit = ?

(ii) If C.P. = ₹116, S.P. = ₹107, then loss = ?

Solution: (i) Profit = S.P. – C.P. = 240 – 235 = ₹5.

(ii) Loss = C.P. – S.P. = 116 – 107 = ₹9.

SOME BASIC FORMULAE

1. Gain on ₹100 is *Gain per cent*

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

Loss on ₹100 is *Loss per cent*

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

Illustration 2: The cost price of a shirt is ₹200 and selling price is ₹250. Calculate the % of profit.

Solution: We have, C.P. = ₹200, S.P. = ₹250.

Profit = S.P. – C.P. = 250 – 200 = ₹50.

$$\therefore \text{Profit \%} = \frac{\text{Profit} \times 100}{\text{C.P.}} = \frac{50 \times 100}{200} = 25\%$$

Illustration 3: Anu bought a necklace for ₹750 and sold it for ₹675. Find her percentage of loss.

Solution: Here, C.P. = ₹750, S.P. = ₹675.

Loss = C.P. – S.P. = 750 – 675 = ₹75.

$$\therefore \text{Loss \%} = \frac{\text{Loss} \times 100}{\text{C.P.}} = \frac{75 \times 100}{750} = 10\%$$

2. When the selling price and gain % are given:

$$\text{C.P.} = \left(\frac{100}{100 + \text{Gain\%}} \right) \times \text{S.P.}$$

3. When the cost and gain per cent are given:

$$\text{S.P.} = \left(\frac{100 + \text{Gain\%}}{100} \right) \times \text{C.P.}$$

Explanation

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

$$= \left[\frac{(\text{S.P.} - \text{C.P.}) \times 100}{\text{C.P.}} \right]$$

$$\therefore \frac{\text{Profit \%}}{100} = \frac{\text{S.P.}}{\text{C.P.}} - 1$$

$$\text{or, } \frac{\text{S.P.}}{\text{C.P.}} = 1 + \frac{\text{Profit \%}}{100}$$

$$\therefore \text{S.P.} = \left(\frac{100 + \text{Profit \%}}{100} \right) \times \text{C.P.}$$

$$\text{and, C.P.} = \left(\frac{100}{100 + \text{Profit \%}} \right) \times \text{S.P.}$$

4. When the cost and loss per cent are given:

$$\text{S.P.} = \left(\frac{100 - \text{Loss \%}}{100} \right) \times \text{C.P.}$$

5. When the selling price and loss per cent are given:

$$\text{C.P.} = \left(\frac{100}{100 - \text{Loss \%}} \right) \times \text{S.P.}$$

Explanation

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

$$= \left[\frac{(\text{C.P.} - \text{S.P.}) \times 100}{\text{C.P.}} \right]$$

$$\therefore \frac{\text{Loss \%}}{100} = 1 - \frac{\text{S.P.}}{\text{C.P.}}$$

$$\text{or } \frac{\text{S.P.}}{\text{C.P.}} = 1 - \frac{\text{Loss \%}}{100}$$

$$\therefore \text{S.P.} = \left(\frac{100 - \text{Loss \%}}{100} \right) \times \text{C.P.}$$

$$\text{and, C.P.} = \left(\frac{100}{100 - \text{Loss \%}} \right) \times \text{S.P.}$$

Illustration 4: Mr Sharma buys a cooler for ₹4500. For how much should he sell it to gain 8%?

Solution: We have, C.P. = ₹4500, gain % = 8%

$$\begin{aligned} \therefore \text{S.P.} &= \left(\frac{100 + \text{Gain \%}}{100} \right) \times \text{C.P.} \\ &= \left(\frac{100 + 8}{100} \right) \times 4500 \\ &= \frac{108}{100} \times 4500 = ₹4860. \end{aligned}$$

Illustration 5: By selling a fridge for ₹7200, Pankaj loses 10%. Find the cost price of the fridge.

Solution: We have, S.P. = ₹7200, loss % = 10%

$$\begin{aligned} \therefore \text{C.P.} &= \left(\frac{100}{100 - \text{Loss \%}} \right) \times \text{S.P.} \\ &= \left(\frac{100}{100 - 10} \right) \times 7200 \\ &= \frac{100}{90} \times 7200 = ₹8000. \end{aligned}$$

Illustration 6: By selling a pen for ₹99, Mohan gains

$12\frac{1}{2}\%$. Find out cost price of the pen.

Solution: Here, S.P. = ₹99, gain % = $12\frac{1}{2}\%$ or $\frac{25}{2}\%$

$$\begin{aligned} \therefore \text{C.P.} &= \left(\frac{100}{100 + \text{Gain \%}} \right) \times \text{S.P.} \\ &= \left(\frac{100}{100 + \frac{25}{2}} \right) \times 99 \\ &= \left(\frac{100 \times 2}{225} \right) \times 99 = ₹88. \end{aligned}$$

SOME USEFUL SHORTCUT METHODS

1. If a man buys x items for ₹ y and sells z items for ₹ w , then the gain or loss per cent made by him is

$$\left(\frac{xw}{zy} - 1 \right) \times 100\%$$

Explanation

S.P. of z items = ₹ w

S.P. of x items = ₹ $\frac{w}{z}x$

Net profit = $\frac{w}{z}x - y$.

$$\therefore \% \text{ Profit} = \frac{\frac{w}{z}x - y}{y} \times 100\%$$

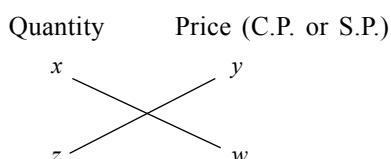
$$\text{i.e., } \left(\frac{xw}{zy} - 1 \right) \times 100\%$$

which represents loss, if the result is negative.

Note:

In the case of gain per cent, the result obtained bears positive sign whereas in the case of loss per cent the result obtained bears sign negative.

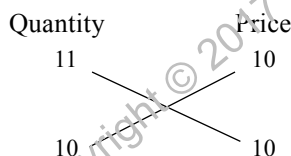
How to Remember?



1. Cross-multiply the numbers connected by the arrows (xw and zy).
2. Mark the direction of the arrows for cross-multiplication. The arrow going down forms the numerator while the arrow going up forms the denominator $\left(\frac{xw}{zy} \right)$.

Illustration 7: If 11 oranges are bought for ₹10 and sold at 10 for ₹11, what is the gain or loss %?

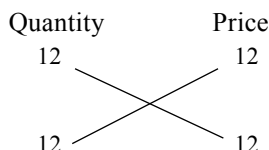
Solution:



$$\begin{aligned} \% \text{ profit} &= \left(\frac{xw}{zy} - 1 \right) \times 100\% \\ &= \left(\frac{11 \times 11}{10 \times 10} - 1 \right) \times 100\% \\ &= \frac{21}{100} \times 100\% = 21\% \end{aligned}$$

Illustration 8: A fruit seller buys apples at the rate of ₹12 per dozen and sells them at the rate of 15 for ₹12. Find out his percentage gain or loss.

Solution:



$$\begin{aligned} \% \text{ gain or loss} &= \left(\frac{xw}{zy} - 1 \right) \times 100\% \\ &= \left(\frac{12 \times 12}{15 \times 12} - 1 \right) \times 100\% \\ &= -\frac{36}{144} \times 100\% = -25\% \end{aligned}$$

Since the sign is -ve, there is a loss of 25%

2. If the cost price of m articles is equal to the selling price of n articles, then

$$\% \text{ gain or loss} = \left(\frac{m-n}{n} \right) \times 100$$

[If $m > n$, it is % gain and, if $m < n$, it is % loss]

Explanation

Let, the C.P. of an article be ₹1.

$$\therefore \text{C.P. of } m \text{ articles} = ₹m \times 1 = ₹m$$

$$\therefore \text{S.P. of } n \text{ articles} = ₹m$$

$$\therefore \text{S.P. of an article} = ₹ \frac{m}{n}$$

$$\therefore \text{Profit on 1 article} = ₹ \left(\frac{m}{n} - 1 \right)$$

$$\text{i.e., } ₹ \left(\frac{m-n}{n} \right)$$

$$\therefore \% \text{ profit} = \left(\frac{m-n}{n} \right) \times 100 \text{ i.e., } \left(\frac{m-n}{n} \right) \times 100$$

Illustration 9: A shopkeeper professes to sell his goods on cost price, but uses 800 gm, instead of 1 Kg. What is his gain %?

Solution: Here, cost price of 1000 gm is equal to selling price of 800 gm,

$$\begin{aligned} \% \text{ gain} &= \left(\frac{m-n}{n} \right) \times 100 \\ &= \left(\frac{1000-800}{800} \right) \times 100 \\ &= \frac{200}{800} \times 100 = 25\% \end{aligned}$$

Illustration 10: If the selling price of 12 articles is equal to the cost price of 18 articles, what is the profit %?

Solution: Here, $m = 18$, $n = 12$

$$\begin{aligned} \therefore \text{Profit \%} &= \left(\frac{m-n}{n} \right) \times 100 \\ &= \left(\frac{18-12}{12} \right) \times 100 \\ &= \frac{6}{12} \times 100 = 50\% \end{aligned}$$

3. If an article is sold at a price S.P.₁, then % gain or % loss is x and if it is sold at a price S.P.₂, then % gain or % loss is y . If the cost price of the article is C.P., then

$$\frac{S.P._1}{100+x} = \frac{S.P._2}{100+y} = \frac{C.P.}{100} = \frac{S.P._1 - S.P._2}{x-y},$$

where x or y is $-ve$, if it indicates a loss, otherwise it is $+ve$.

Illustration 11: By selling a radio for ₹1536, Suresh lost 20%. What per cent shall he gain or lose by selling it for ₹2000?

Solution: Here, S.P.₁ = 1536, $x = -20$
($-ve$ sign indicates loss)

S.P.₂ = ₹2000, $y = ?$

Using the formula:

$$\frac{S.P._1}{100+x} = \frac{S.P._2}{100+y},$$

$$\text{we get, } \frac{1536}{100-20} = \frac{2000}{100+y}$$

$$\Rightarrow 100+y = \frac{2000 \times 80}{1536} = 104\frac{1}{6}$$

$$\Rightarrow y = 4\frac{1}{6}\%$$

Thus, Suresh has a gain of $4\frac{1}{6}\%$ by selling it for ₹2000.

4. If 'A' sells an article to 'B' at a gain/loss of $m\%$ and 'B' sells it to 'C' at a gain/loss of $n\%$. If 'C' pays ₹ z for it to 'B', then the cost price for 'A' is

$$\left[\frac{100^2 z}{(100+m)(100+n)} \right]$$

where m or n is $-ve$, if it indicates a loss, otherwise it is $+ve$.

Illustration 12: Mohit sells a bicycle to Rohit at a gain of 10% and Rohit again sells it to Jyoti at a profit of 5%. If Jyoti pays ₹462 to Rohit, what is the cost price of the bicycle for Mohit?

Solution: Here, $m = 10$, $n = 5$, $z = ₹462$.

Using the formula,

$$C.P. = \left[\frac{100^2 z}{(100+m)(100+n)} \right]$$

$$\begin{aligned} \text{we get, C.P. for Mohit} &= \left[\frac{100^2 \times 462}{(100+10)(100+5)} \right] \\ &= \frac{462 \times 10000}{110 \times 105} = ₹400. \end{aligned}$$

Illustration 13: 'A' sells a DVD to 'B' at a gain of 17% and 'B' again sells it to 'C' at a loss of 25%. If 'C' pays ₹1053 to 'B', what is the cost price of the DVD to 'A'?

Solution: We have, $m = 17$, $n = -25$, $z = ₹1053$.

\therefore Cost price of DVD to

$$\begin{aligned} &= \left[\frac{100^2 z}{(100+m)(100+n)} \right] \\ &= \frac{100 \times 100 \times 1053}{(100+17)(100-25)} \\ &= \frac{100 \times 100 \times 1053}{117 \times 75} = ₹1200. \end{aligned}$$

5. If 'A' sells an article to 'B' at a gain/loss of $m\%$, and 'B' sells it to 'C' at a gain/loss of $n\%$, then the resultant profit/loss per cent is given by

$$\left(m + n + \frac{mn}{100} \right) \quad \dots(1)$$

Where m or n is $-ve$, if it indicates a loss, otherwise it is $+ve$.

Note:

The expression given by eq. (1) represents resultant profit or loss according as it is $+ve$ or $-ve$.

Illustration 14: 'A' sells a horse to 'B' at a profit of 5% and 'B' sells it to 'C' at a profit of 10%. Find out the resultant profit per cent.

Solution: We have, $m = 5$ and $n = 10$.

$$\begin{aligned} \therefore \text{Resultant profit \%} &= \left(m + n + \frac{mn}{100} \right) \\ &= \left(5 + 10 + \frac{5 \times 10}{100} \right) \\ &= \frac{31}{2}\% \quad \text{or, } 15\frac{1}{2}\% \end{aligned}$$

Illustration 15: Manoj sells a shirt to Yogesh at a profit of 15%, and Yogesh sells it to Suresh at a loss of 10%. Find the resultant profit or loss.

Solution: Here, $m = 15$, $n = -10$

$$\therefore \text{Resultant profit/loss \%} = \left(m + n + \frac{mn}{100} \right)$$

$$= \left(15 - 10 + \frac{15 \times -10}{100} \right) = \left(15 - 10 - \frac{150}{100} \right)$$

$$= 7/2\% \text{ or } 3\frac{1}{2}\%,$$

which represents profit as the sign is +ve.

6. When two different articles are sold at the same selling price, getting gain/loss of $x\%$ on the first and gain/loss of $y\%$ on the second, then the overall % gain or % loss in the transaction is given by

$$\left[\frac{100(x+y) + 2xy}{(100+x) + (100+y)} \right] \%$$

The above expression represent overall gain or loss according as its sign is +ve or -ve.

7. When two different articles are sold at the same selling price getting a gain of $x\%$ on the first and loss of $x\%$ on the second, then the overall % loss in the transaction is given by

$$\left(\frac{x}{10} \right)^2 \%$$

Note that in such questions, there is always a loss.

Explanation

Let, each article be sold at ₹z.

Since gain/loss of $x\%$ is made on the first, cost price of the first article

$$= ₹z \left(\frac{100}{100+x} \right)$$

Also, gain/loss of $y\%$ is made on the second. Therefore, cost price of the second article

$$= ₹z \left(\frac{100}{100+y} \right)$$

$$\therefore \text{Total C.P.} = z \left(\frac{100}{100+x} \right) + z \left(\frac{100}{100+y} \right)$$

$$= z \left[\frac{100(100+y) + 100(100+x)}{(100+x)(100+y)} \right]$$

Total S.P. = 2z.

$$\therefore \text{Overall \% gain or loss} = \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100$$

$$= \frac{2z - \frac{100z[100+x+100+y]}{(100+x)(100+y)}}{\frac{100z[100+x+100+y]}{(100+x)(100+y)}} \times 100$$

$$= \frac{2(100+x)(100+y) - 100(200+x+y)}{100(200+x+y)} \times 100$$

$$= \frac{100x + 100y + 2xy}{(100+x) + (100+y)} \%$$

$$= \left[\frac{100(x+y) + 2xy}{(100+x) + (100+y)} \right] \%$$

Note:

In case $y = -x$, we have

$$\text{Overall \% gain or loss} = -\frac{x^2}{100} \%,$$

Since the sign is -ve, there is always a loss.

Illustration 16: Mahesh sold two scooters, each for ₹24000. If he makes 20% profit on the first and 15% loss on the second, what is his gain or loss per cent in the transactions?

Solution: Here, $x = 20$ and $y = -15$.

\therefore Over all gain/loss %

$$= \left[\frac{100(x+y) + 2xy}{(100+x) + (100+y)} \right] \%$$

$$= \left[\frac{100(20-15) + 2 \times 20 \times -15}{(100+20) + (100-15)} \right] \%$$

$$= -\frac{100}{205} \% = -\frac{20}{41} \%$$

which represents loss, being a -ve expression.

Illustration 17: Rajesh sold two horses for ₹990 each; gaining 10% on the one and losing 10% on the other. Find out his total gain or loss per cent.

Solution: Here, $x = 10$.

$$\therefore \text{Overall loss \%} = \left(\frac{x}{10} \right)^2 \% = \left(\frac{10}{10} \right)^2 \% = 1\%$$

8. A merchant uses faulty measure and sells his goods at gain/loss of $x\%$. The overall % gain/loss(g) is given by

$$\frac{100+g}{100+x} = \frac{\text{True measure}}{\text{Faulty measure}}$$

Note:

If the merchant sells his goods at cost price, then $x = 0$.

9. A merchant uses $y\%$ less weight/length and sells his goods at gain/loss of $x\%$. The overall % gain/loss is given by

$$\left[\left(\frac{y+x}{100-y} \right) \times 100 \right] \%$$

Illustration 18: A dishonest shopkeeper professes to sell cloth at the cost price, but he uses faulty meter rod. His meter rod measures 95 cm only. Find his gain per cent.

Solution: Here, true measure = 100 cm.

False measure = 95 cm.

Since the shopkeeper sells the cloth at cost price, $\therefore x = 0$.

\therefore Overall gain % is given by

$$\frac{100 + g}{100 + x} = \frac{\text{True measure}}{\text{Faulty measure}}$$

$$\Rightarrow \frac{100 + g}{100} = \frac{100}{95} \Rightarrow 100 + g = \frac{100 \times 100}{95}$$

$$\Rightarrow g = \frac{10000}{95} - 100 = 5 \frac{5}{19} \%$$

Illustration 19: A dishonest shopkeeper professes to sell his goods at cost price, but he uses a weight of 800 g for the Kg weight. Find out his gain per cent.

Solution: True measure = 1000 g.

False measure = 800 g. Also, $x = 0$.

\therefore Overall gain % is given by

$$\frac{100 + g}{100 + x} = \frac{\text{True measure}}{\text{False measure}}$$

$$\Rightarrow \frac{100 + g}{100} = \frac{1000}{800} \Rightarrow 100 + g = \frac{1000 \times 100}{800}$$

$$\Rightarrow g = \frac{1000}{8} - 100 = 25\%$$

Illustration 20: A shopkeeper sells goods at 44% loss on cost price, but uses 30% less weight. What is his percentage profit or loss?

Solution: Here, $x = -44$ and $y = 30$.

$$\begin{aligned} \therefore \text{Overall gain/loss\%} &= \left(\frac{y + x}{100 - y} \right) \times 100\% \\ &= \left(\frac{30 - 44}{100 - 30} \times 100 \right) \% \\ &= \left(\frac{-14}{70} \times 100 \right) \% = -20\%, \end{aligned}$$

which represents loss being a negative expression.

10. A person buys two items for ₹ A and sells one at a loss of $l\%$ and the other at a gain of $g\%$. If each item was sold at the same price, then

(a) The cost price of the item sold at loss

$$= \frac{A(100 + \% \text{gain})}{(100 - \% \text{loss}) + (100 + \% \text{gain})}$$

(b) The cost price of the item sold at gain

$$= \frac{A(100 - \% \text{loss})}{(100 - \% \text{loss}) + (100 + \% \text{gain})}$$

Illustration 21: Ramesh buys two books for ₹410. He sells one at a loss of 20% and the other at a gain of 25%. If both the books are sold at the same price, find out the cost price of two books.

Solution: Cost price of the book sold at a loss of 20%

$$\begin{aligned} &= \frac{410(100 + 25)}{(100 - 20) + (100 + 25)} \\ &= \frac{410 \times 125}{80 + 125} = ₹250. \end{aligned}$$

Cost price of the book sold at a profit of 25%

$$\begin{aligned} &= \frac{410(100 - 20)}{(100 - 20) + (100 + 25)} = \frac{410 \times 80}{80 + 125} \\ &= ₹160. \end{aligned}$$

11. If two successive discounts on an article are $m\%$ and $n\%$ respectively, then a single discount equivalent to the two successive discounts will be:

$$\left(m + n - \frac{mn}{100} \right) \%$$

Explanation

Let, the marked price of the article be ₹100.

\therefore S.P. after the first discount = ₹ $(100 - m)$ and discount

at $n\%$ on ₹ $(100 - m)$ = ₹ $\frac{(100 - m) \times n}{100}$.

\therefore Single equivalent discount

$$\begin{aligned} &= \left[m + \frac{(100 - m) \times n}{100} \right] \% \\ &= \left(\frac{100m + 100n - mn}{100} \right) \% \\ &= \left(m + n - \frac{mn}{100} \right) \% \end{aligned}$$

12. If three successive discounts on an article are $l\%$, $m\%$ and $n\%$ respectively, then a single discount equivalent to the three successive discounts will be

$$\left[l + m + n - \frac{(lm + ln + mn)}{100} + \frac{lmn}{100^2} \right] \%$$

Explanation

Let, the marked price of the article be ₹100.

∴ S.P. after the first discount = ₹(100 - l).

Second discount at m% on ₹(100 - l)

$$= ₹ \frac{(100 - l) \times m}{100}$$

∴ S.P. after second the discount

$$\begin{aligned} &= ₹(100 - l) - \frac{(100 - l)m}{100} \\ &= ₹ \frac{100(100 - l) - (100 - l)m}{100} \\ &= ₹ \frac{(100 - l) \cdot (100 - m)}{100} \end{aligned}$$

Third discount at n% on ₹ $\frac{(100 - l)(100 - m)}{100}$

$$= ₹ \frac{(100 - l)(100 - m)n}{100 \times 100}$$

∴ S.P. after the third discount

$$\begin{aligned} &= ₹ \frac{(100 - l)(100 - m)}{100} - \frac{(100 - l)(100 - m)n}{100 \times 100} \\ &= ₹ \frac{(100 - l)(100 - m)(100 - n)}{100 \times 100} \end{aligned}$$

$$= \left(l + m + n - \frac{(lm + ln + mn)}{100} + \frac{lmn}{(100)^2} \right)$$

∴ Single equivalent discount

$$= \left(l + m + n - \frac{(lm + ln + mn)}{100} + \frac{lmn}{(100)^2} \right) \%$$

Illustration 22: Find a single discount equivalent to two successive discounts of 10% and 20%.

Solution: The equivalent single discount is given by

$$\left(10 + 20 - \frac{10 \times 20}{100} \right) \%, \text{ i.e., } 28\%$$

Illustration 23: Find out a single discount equivalent to three successive discounts of 10%, 20% and 30%.

Solution: The equivalent single discount is given by

$$\left(10 + 20 + 30 - \frac{(10 \times 20 + 10 \times 30 + 20 \times 30)}{100} + \frac{10 \times 20 \times 30}{100^2} \right) \%$$

$$\text{i.e., } \left(60 - 11 + \frac{6}{10} \right) \% = \frac{496}{10} \% \text{ or } 49.6\%$$

Illustration 24: Two shopkeepers sell machines at the same list price. The first allows two successive discounts

of 30% and 16% and the second 20% and 26%. Which discount series is more advantageous to the buyers?

Solution: A single discount equivalent to the two successive discounts of 30% and 16% is

$$\left(30 + 16 - \frac{30 \times 16}{100} \right) \%$$

$$\text{or, } \left(46 - \frac{24}{5} \right) \% \text{ or, } 41 \frac{1}{5} \%$$

Also, a single discount equivalent to the two successive discounts of 20% and 26% is

$$\left(20 + 26 - \frac{20 \times 26}{100} \right) \%$$

$$\text{or, } \left(46 - \frac{26}{5} \right) \% \text{ or } 40 \frac{4}{5} \%$$

Clearly, the discount series being offered by the first shopkeeper is more advantageous to the buyers.

13. A shopkeeper sells an item at ₹z after offering a discount of d% on labelled price. Had he not offered the discount, he would have earned a profit of p% on the cost price.

The cost price of each item is given by

$$\text{C.P.} = \left[\frac{100^2 z}{(100 - d)(100 + p)} \right]$$

Illustration 25: A shopkeeper sold sarees at ₹266 each after giving 5% discount on labelled price. Had he not given the discount, he would have earned a profit of 12% on the cost price. What was the cost price of each saree?

Solution: We have, labelled price z = ₹266, discount d = 5% and profit p = 12%

Using the formula

$$\text{C.P.} = \left[\frac{100^2 z}{(100 - d)(100 + p)} \right]$$

we get the cost price of each saree

$$= \left[\frac{100 \times 100 \times 266}{(100 - 5)(100 + 12)} \right]$$

$$= \frac{100 \times 100 \times 266}{95 \times 112} = ₹250.$$

EXERCISE-I

1. Mohan buys a watch for ₹350 and sells it for ₹392. Find out his percentage of profit.
 - (a) 9% (b) 12%
 - (c) 14% (d) None of these
2. Ramesh purchased a bicycle for ₹5200 and spent ₹800 on its repairs. He had to sell it for ₹5500. Find out his profit or loss per cent.
 - (a) $8\frac{1}{3}\%$ loss (b) $7\frac{1}{2}\%$ gain
 - (c) 9% (d) None of these
3. A man buys 10 articles for ₹8 and sells them at ₹1.25 per article. His gain per cent is:
 - (a) 55% (b) $56\frac{1}{4}\%$
 - (c) 40% (d) None of these
4. A toothpaste labeled at ₹80 is sold for ₹68. The rate of discount is:
 - (a) 12% (b) 14%
 - (c) 15% (d) None of these
5. Sardar Singh bought 200 dozen oranges at ₹10 a dozen. He spent ₹500 on transportation. He sold them at ₹1 each. What was his profit or loss per cent?
 - (a) 4% (b) 6%
 - (c) 5% (d) None of these
6. Mr Verma sold his scooter for ₹10500 at a gain of 5%. Find out the cost price of the scooter.
 - (a) ₹10300 (b) ₹10700
 - (c) ₹10000 (d) None of these
7. Suresh buys a camera for ₹1800 and sells it at 10% loss. Find out its selling price.
 - (a) ₹1620 (b) ₹1730
 - (c) ₹1650 (d) None of these
8. Hemant purchased 120 rims of paper at ₹80 per rim. He spent ₹280 on transportation, paid octroi at the rate of 40 paise per rim and paid ₹72 to the coolie. If he wants to have a gain of 8%, the selling price per rim must be:
 - (a) ₹89 (b) ₹90
 - (c) ₹95 (d) None of these
9. A shopkeeper loses 7% by selling a cricket ball for ₹31. For how much should he sell the ball so as to gain 5%?
 - (a) ₹50 (b) ₹65
 - (c) ₹35 (d) None of these
10. A shopkeeper sold some articles at ₹35 per piece and gained 40%. What would be the selling price of each article to earn 60% profit?
 - (a) ₹40 (b) ₹45
 - (c) ₹50 (d) None of these
11. A man bought apples at the rate of 6 for ₹20 and sold them at 4 for ₹16. His estimated profit % is:
 - (a) 23% (b) 12%
 - (c) 20% (d) None of these
12. A fruit vendor buys 10 bananas for ₹14 and sells them at 12 for ₹15. Find his percentage gain or loss.
 - (a) $10\frac{5}{7}\%$ loss (b) $10\frac{5}{9}\%$ gain
 - (c) 6% gain (d) None of these
13. If eggs are bought 12 for ₹10 and sold at 10 for ₹12. What is the gain or loss%.
 - (a) 40% loss (b) 44% gain
 - (c) 44% loss (d) None of these
14. If the cost price of 21 watches is equal to the selling price of 18 pieces, then what would be the gain per cent in this transaction?
 - (a) $6\frac{1}{2}\%$ (b) 7%
 - (c) $6\frac{2}{3}\%$ (d) None of these
15. A shopkeeper gains the cost of 8 metres thread by selling 40 metres thread. Find his gain per cent.
 - (a) 19% (b) 20%
 - (c) 22% (d) None of these
16. If the selling price of $\frac{2}{3}$ of a certain quantity of milk be equal to the cost price of whole milk, then what will be the gain per cent in this transaction?
 - (a) 50% (b) 48%
 - (c) 53% (d) None of these
17. A shopkeeper sells 20 pencils for the same amount of money as he paid for 25 pencils. What is his gain per cent?
 - (a) 20% (b) 25%
 - (c) 24% (d) None of these

18. Mohit lost 18% by selling a bicycle for ₹1230. What per cent shall he gain or loss by selling it for ₹1600?
- (a) $6\frac{2}{3}\%$ loss (b) 4% gain
(c) $6\frac{2}{3}\%$ gain (d) None of these
19. A shopkeeper sells an article at a gain of 10%. Had he sold it at a loss of 20%, its selling price would have been ₹180 less. What is the cost price of the article?
- (a) ₹630 (b) ₹600
(c) ₹580 (d) None of these
20. A person sells 36 oranges per ₹1 and makes a loss of 4%. Find how many oranges per ₹ to be sold to have a gain of 8%?
- (a) $\frac{1}{32}$ (b) 5
(c) $\frac{1}{16}$ (d) None of these
21. A person sells a colour TV at 10% below the cost price. Had he received ₹1494 more, he would have made a profit of $12\frac{1}{2}\%$. What was the cost price of the colour TV?
- (a) ₹6400 (b) ₹7200
(c) ₹6640 (d) None of these
22. Vijay sold a watch at a gain of 5%. Had he sold it for ₹72 more, he would have gained 13%. Find out the cost price of the watch.
- (a) ₹900 (b) ₹910
(c) ₹870 (d) None of these
23. Sita sells a calculator to Gita at a gain of 17% and Gita sells it to Anu at a loss of 25%. If Anu pays ₹1842.75 for it, then what did Sita pay for it?
- (a) ₹2080 (b) ₹2100
(c) ₹2110 (d) None of these
24. 'A' buys an article and sells it to 'B' at a profit of 10%, 'B' sells it to 'C' gaining 20%. If 'C' gives ₹924, what amount did 'A' give?
- (a) ₹700 (b) ₹724
(c) ₹780 (d) None of these
25. 'A' sells an article to 'B' at a gain of 20% and 'B' sells it to 'C' at a gain of 10% and 'C' sells it to 'D' at a gain of $12\frac{1}{2}\%$. If 'D' pays ₹29.70 what did it cost to 'A'?
- (a) ₹20 (b) ₹24
(c) ₹18 (d) None of these
26. Rajesh sells taperecorder to Mihir at a loss of 10% and Mihir sells it to Shiv at a loss of 20%. If Shiv pays ₹1440 for it, at what price did Rajesh buy?
- (a) ₹1920 (b) ₹2000
(c) ₹1800 (d) None of these
27. A man sells a scooter to his friend at 10% loss. If the friend sells it for ₹54000 and gains 20%, find out the original cost price of the scooter.
- (a) ₹50000 (b) ₹45000
(c) ₹40000 (d) None of these
28. 'A' sells a good to 'B' at a profit of 10% and B sells it to 'C' at a profit of 20%. Find out the resultant profit.
- (a) 35% (b) 20%
(c) 32% (d) None of these
29. A manufacturer sells an article to a wholesale dealer at a profit of 20%. The wholesale dealer sells it to a retail merchant at a loss of 5%. Find out the resultant profit or loss.
- (a) 14% loss (b) 14% gain
(c) 12% gain (d) None of these
30. A man sold two watches for ₹3750 each. On one he gained 5%, and on the other, he lost 5%. What was his total gain or loss percentage?
- (a) $1\frac{1}{4}\%$ (b) $\frac{1}{2}\%$
(c) $\frac{1}{4}\%$ (d) None of these
31. A man sells two houses at the rate of ₹1.995 Lakhs each. On one house he gains 20% and on the other he loses 20%. His gain or loss per cent in the whole transaction is:
- (a) 5% loss (b) 4%
(c) 4% loss (d) None of these
32. A shopkeeper sold two bicycles for ₹1500 each. On one, he gains 25% and on the other he loses 20%. His gain or loss per cent in the whole transaction is:
- (a) $2\frac{18}{41}\%$ loss (b) $2\frac{18}{41}\%$ gain
(c) 2% gain (d) None of these
33. A man sells two articles, each for ₹640. He earns 20% profit on the first, and 40% profit on the second. Find his overall per cent profit.
- (a) $29\frac{1}{2}\%$ (b) $28\frac{1}{2}\%$
(c) $29\frac{3}{13}\%$ (d) None of these

34. A person sells two articles, each for ₹1040. He incurs 20% loss on the first and 10% loss on the second. Find out overall per cent loss.
- (a) $12\frac{5}{17}\%$ (b) $15\frac{5}{17}\%$
(c) $13\frac{3}{4}\%$ (d) None of these
35. A grocer sells rice at a profit of 20% and uses a weight which is 25% less. Find out overall gain percentage.
- (a) 60% (b) 65%
(c) 58% (d) None of these
36. A shopkeeper sells goods at 10% loss on cost price, but uses 20% less weight. What is his profit or loss percentage?
- (a) 2% gain (b) $2\frac{1}{2}\%$ loss
(c) $2\frac{1}{2}\%$ gain (d) None of these
37. A cloth merchant says that due to slump in the market, he sells cloth at 10% loss, but he uses an inaccurate metre scale and actually gains 15%. Find out the actual length of the scale.
- (a) 72.4 cm (b) 71.34 cm
(c) 78.25 cm (d) None of these
38. A cloth dealer professes to sell cotton at cost price, but uses a meter having a length of 80 cm only and charges for the meter. Find his gain per cent.
- (a) 25% (b) 30%
(c) 40% (d) None of these
39. Sudeep buys two CDs for ₹380 and sells one at a loss of 22% and the other at a gain of 12%. If both the CDs are sold at the same price, then the cost price of two CDs is:
- (a) ₹196, ₹225 (b) ₹230, ₹140
(c) ₹224, ₹156 (d) None of these
40. An article is listed at ₹65. A customer bought this article for ₹56.16 and received two successive discounts of which one is 10%. Find out the other discount in this discount scheme offered by the shopkeeper.
- (a) 4% (b) 3%
(c) 6% (d) None of these
41. A cash payment that will settle a bill for 250 chairs at ₹50 per chair less 20% and 15% with a further discount of 5% on cash payment is:
- (a) ₹7025 (b) ₹8075
(c) ₹8500 (d) None of these
42. A person sells taperecorders at ₹1134 each after giving a discount of 19% on the marked price. Had he not given the discount, he would have earned a profit of 40% on the cost price. The cost price of each taperecorder is:
- (a) ₹1000 (b) ₹1200
(c) ₹1400 (d) None of these

EXERCISE-2 (BASED ON MEMORY)

1. The profit earned after selling an article for ₹536 is the same as the loss incurred after selling the article for ₹426. What is the cost price of the article?
- (a) ₹448 (b) ₹470
(c) ₹481 (d) ₹500
(e) None of these
[Andhra Bank PO, 2007]
2. The cost of manufacturing an article was ₹900. The trader wants to gain 25% after giving a discount of 10%. The marked price must be:
- (a) ₹1500 (b) ₹1250
(c) ₹1200 (d) ₹1000
[SSC (GL) Prel. Examination, 2005]
3. By selling a table for ₹350 instead of ₹400, loss per cent increases by 5%. The cost price of the table is:
- (a) ₹1050 (b) ₹417.50
(c) ₹435 (d) ₹1000
[SSC (GL) Prel. Examination, 2005]
4. By selling a plot of land for ₹45000, a person loses 10%. At what price should he sell it to gain 15%?
- (a) ₹50000 (b) ₹55000
(c) ₹57500 (d) ₹60000
[SSC (GL) Prel. Examination, 2005]
5. A man bought pencils at the rate of 6 for ₹4 and sold them at the rate of 4 for ₹6. His gain in the transaction is:

- (a) 75% (b) 80%
(c) 125% (d) 100%

[SSC (GL) Prel. Examination, 2005]

6. If an article is sold for ₹178 at a loss of 11%, then what should be its selling price in order to earn a profit of 11%?
(a) ₹220.50 (b) ₹267
(c) ₹222 (d) ₹220

[SSC (GL) Prel. Examination, 2005]

7. A dealer sold two T.V. sets for ₹7400 each. On one, he gained 10% and on the other, he lost 10%. The dealer's loss or gain in the transaction was:
(a) no profit no loss (b) 1% gain
(c) 0.1% loss (d) 1% loss

[SSC (GL) Prel. Examination, 2005]

8. A shopkeeper purchased rice of 3 varieties *a*, *b*, *c* which cost ₹34.50, ₹28.60 and ₹32.40 per Kg respectively. In which of the following bargain he will earn the maximum?
(a) He purchased *a* and *c* each 20 Kg and sold them at ₹38.00 and ₹36.00 per Kg respectively
(b) He purchased *a* and *b* 30 Kg and 40 Kg respectively and sold them at ₹37.00 and ₹33.00 per Kg respectively
(c) He purchased *b* and *c* 20 Kg and 40 Kg respectively and sold them at ₹40.00 and ₹38.00 per Kg respectively
(d) He purchased *c* and *a* 25 Kg and 30 Kg respectively and sold them at ₹42.00 and ₹38.00 per Kg respectively
(e) He purchased *b* and *a* 40 Kg and 20 Kg respectively and sold them at ₹37.00 and ₹40.00 per Kg respectively

[SBI PO, 2005]

9. The profit earned after selling an article for ₹625 is the same as the loss incurred after selling the article for ₹435. What is the cost price of the article?
(a) ₹530 (b) ₹520
(c) ₹540 (d) ₹550
(e) None of these

[Bank of Baroda PO, 2007]

10. Srinivas sold an article for ₹460 and earned a profit of 15%. At what price should it have been sold so as to earn a profit of 20%?
(a) ₹483 (b) ₹480
(c) ₹498 (d) ₹485
(e) None of these

[PNB Management Trainee, 2007]

11. The profit earned after selling a wristwatch for ₹5765 is the same as the loss incurred after selling the wristwatch for ₹4315. What is the cost price of the wristwatch?

- (a) ₹6000 (b) ₹5100
(c) ₹4900 (d) ₹5040
(e) None of these

[OBC PO, 2007]

12. A trader sells 145 metre of cloth for ₹12325 at the profit of ₹10 per metre of cloth. What is the cost price of 1 metre of cloth?

- (a) ₹65 (b) ₹75
(c) ₹95 (d) ₹85
(e) None of these

[SBI PO, 2008]

13. The profit earned after selling an article for ₹522 is the same as the loss incurred after selling the article for ₹378. What is the cost price (in ₹) of the article?

- (a) ₹4602 (b) ₹4903
(c) ₹520 (d) ₹5505
(e) None of these

[Corporation Bank PO, 2007]

14. What per cent of selling price would be 34% of cost price if gross profit is 26% of the selling price?

- (a) 17.16 (b) 74.00
(c) 25.16 (d) 88.40
(e) None of these

[BSRB Bangalore PO, 2000]

15. Mr. Gupta, Mr. Shastri and Mr Saxena together earned ₹19800. The ratio of earnings between Mr. Gupta and Mr. Shastri is 2:1 while that between Mr. Shastri and Mr. Saxena is 3:2. How much did Mr. Shastri earn?

- (a) ₹3600 (b) ₹5400
(c) ₹1800 (d) ₹6300
(e) None of these

[BSBR Bangalore PO, 2000]

16. A grocer purchased 20 Kg of wheat at the rate of ₹15 per Kg and 30 Kg of wheat at the rate of ₹13 per Kg. At what price per Kg should he sell the mixture to earn $33\frac{1}{3}\%$ profit on the cost price?

- (a) ₹28.00 (b) ₹20.00
(c) ₹18.40 (d) ₹17.40
(e) None of these

[BSRB Delhi PO, 2000]

17. By selling an article for ₹96, double the profit is obtained than the profit that would have been obtained

by selling it for ₹84. What is the cost price of the article?

- (a) ₹72.00 (b) ₹75.00
(c) ₹70.00 (d) ₹68.00
(e) None of these

[BSRB Delhi PO, 2000]

18. A shopkeeper sells a T.V. set for ₹16560 at 10% discount on its marked price and earns 15% profit. If no discount is offered then what will be his per cent profit?

- (a) $27\frac{7}{9}$ (b) $22\frac{7}{9}$
(c) $25\frac{7}{9}$ (d) Data inadequate
(e) None of these

[BSRB Patna PO, 2001]

19. A shopkeeper sold an article offering a discount of 5% and earned a profit of 23.5%. What would have been the percentage of profit earned if no discount had been offered?

- (a) 28.5 (b) 24.675
(c) 30 (d) Data inadequate
(e) None of these

[Andhra Bank SO, 2002]

20. A shopkeeper sold a TV set for ₹17940, at a discount of 8% and gained 19.6%. If no discount is allowed, what will be his gain per cent?

- (a) 25% (b) 36.4%
(c) 24.8% (d) Cannot be determined
(e) None of these

[RBI Grade 'B' Officers, 2002]

21. A man sold two watches for ₹240 each; on one he gained 20% and on the other he lost 20%. The gain or loss per cent in the transaction is:

- (a) 1% gain (b) 1% loss
(c) 4% gain (d) 4% loss

[SI of Police Rec. Examination, 1997]

22. Mohan sells two tape recorders at the same price. On one he gains 10% and on the other he loses 10%. The total gain or loss in transaction is:

- (a) 1% gain (b) 1% loss
(c) No loss or no gain (d) 2% loss

[SI of Police Rec. Examination, 1997]

23. A man bought a car for ₹60000 and spent 10% of the cost of the car for purchase of new tyres. At what price should he sell the car to make a gain of 15%?

- (a) ₹79,500 (b) ₹74,500
(c) ₹75,900 (d) ₹73,500

[SI of Police Rec. Examination, 1997]

24. A merchant bought 60 sheep at ₹120 per sheep. He sold 40 of them at ₹150 each. 10 of them died. What should be the selling price of the remaining sheep if he wants a profit of ₹800?

- (a) ₹150 (b) ₹200
(c) ₹250 (d) ₹180

[SI of Police Rec. Examination, 1997]

25. A merchant allows 10% for each payment on the marked price of an article and still gains at the rate of 10%. The cost price of an article which is marked as ₹77 is:

- (a) ₹70 (b) ₹60
(c) ₹63 (d) ₹62.37

[SI of Police Rec. Examination, 1997]

26. The price of a jewel, passing through three hands, rises on the whole to 65%. If the first and the second sellers earned 20% and 25% profit respectively, the profit earned by the third seller is:

- (a) 20% (b) 15%
(c) 10% (d) 5%

[SI of Police Rec. Examination, 1997]

27. A shopkeeper professes to sell his goods at cost price but uses a weight of 800 g instead of kilogram weight. Thus, he makes a profit of:

- (a) 2% (b) 8%
(c) 20% (d) 25%

[SI of Police Rec. Examination, 1997]

28. If selling price of an article is $\frac{4}{3}$ of its cost price, the profit in transaction is:

- (a) $\frac{1}{3}$ % (b) $20\frac{1}{2}$ %
(c) $33\frac{1}{3}$ % (d) $25\frac{1}{2}$ %

[SI Rec. Examination (D.P.), 1997]

29. A grocer mixes 26 Kg of tea which costs ₹20 a Kg with 30 Kg of tea which costs ₹36 a Kg and sells the mixture at ₹30 a Kg. His profit per cent is:

- (a) 5% (b) 6%
(c) 7% (d) 8%

[SI Rec. Examination (D.P.), 1997]

30. If the cost price of 15 tables be equal to the selling price of 20 tables, the loss per cent in the transaction is:

- (a) 18% (b) 20%
(c) 25% (d) 24%

[SI Rec. Examination (D.P.), 1997]

31. If 5% more is gained by selling an article for ₹350 then by selling it for ₹340, the cost of the article (in rupees) is:

(a) 50 (b) 160
(c) 200 (d) 225

[SI Rec. Examination (D.P.), 1997]

32. On selling an article for ₹700, the loss is 20%. To make a profit of 20%, the article must be sold at:

(a) ₹1050 (b) ₹850
(c) ₹1075 (d) ₹875

[SI Rec. Examination (D.P.), 1997]

33. A man purchased a box full of pencils at the rate of 7 for ₹9 and sold all of them at the rate of 8 for ₹11. In this transaction, he gained ₹10. How many pencils did the box contain?

(a) 100 (b) 112
(c) 114 (d) 115

[SI Rec. Examination (D.P.), 1997]

34. The cost price of 16 articles is equal to selling price of 12 of them. The gain or loss per cent in the transaction is:

(a) $33\frac{1}{3}\%$ loss (b) $23\frac{1}{3}\%$ loss
(c) $33\frac{1}{3}\%$ gain (d) $23\frac{1}{3}\%$ gain

[SI Rec. Examination (D.P.), 1997]

35. A businessman marks his goods in such a way that even after allowing 12.5% discount on cash purchase, he gains 20%. If the cost price of the goods is ₹140, the marked price is:

(a) ₹162 (b) ₹172
(c) ₹192 (d) ₹198

[SI Rec. Examination (D.P.), 1997]

36. A watch is sold for ₹880 at a loss of 20%. For how much should it be sold to gain 10%?

(a) ₹1000 (b) ₹1100
(c) ₹1210 (d) ₹1400

[SI Rec. Examination (D.P.), 1997]

37. Applied to a bill for ₹15000, the difference (in ₹) between a discount of 50% and two successive discount of 30% and 20% is:

(a) 0 (b) 450
(c) 900 (d) 1000

[SI Rec. Examination (D.P.), 1997]

38. A sum of ₹2430 was divided among three persons X, Y, Z such that if their shares were diminished

by ₹5, would be in the ratio 3:4:5. In this division, X got:

(a) ₹1015 (b) ₹810
(c) ₹605 (d) ₹595

[Assistant's Grade Examination, 1997]

39. The ratio between the annual incomes of A and B is 4:3 and between their annual expenditures is 3:2. If at the end of a year both save ₹600 each, find the difference in the income.

(a) ₹450 (b) ₹500
(c) ₹600 (d) ₹750

[Assistant's Grade Examination, 1997]

40. If 3 toys are sold at the cost price of 4 toys of the same kind, the profit will be:

(a) 25% (b) $33\frac{1}{3}\%$
(c) $66\frac{2}{3}\%$ (d) 50%

[SSC (GL) Prel. Examination, 2000]

41. A sells a bicycle to B at a profit of 20%. B sells it to C at a profit of 25%. If C pays ₹225 for it, the cost price of the bicycle for A is:

(a) ₹110 (b) ₹125
(c) ₹120 (d) ₹150

[SSC (GL) Prel. Examination 2000, (MS)]

42. A retailer buys 40 pens at the marked price of 36 pens from a whole-saler. If he sells these pens giving a discount of 10%, what is the profit per cent?

(a) 9% (b) 10%
(c) $10\frac{1}{9}\%$ (d) 11%

[SSC (GL) Prel. Examination, 2000]

43. 12 copies of a book were sold for ₹1800, thereby gaining cost price of 3 copies. The cost price of a copy is:

(a) ₹120 (b) ₹150
(c) ₹1200 (d) ₹1500

[SSC (GL) Prel. Examination, 2000]

44. A shopkeeper marks his sharees at 20% above the cost price and allows a purchaser a discount of 10% for cash buying. What profit per cent does he make?

(a) 18 (b) 12
(c) 10 (d) 8

[SSC (GL) Prel. Examination, 2000]

45. A shopkeeper purchased a chair marked at ₹800, at two successive discounts of 10% and 15%,

respectively. He spent ₹28 on transportation and sold the chair for ₹800. His gain per cent is:

- (a) 40 (b) 30
(c) 25 (d) 14

[SSC (GL) Prel. Examination, 2000]

46. The selling price of 5 articles is same as the cost price of 3 articles. The gain or loss is:

- (a) 20% gain (b) 25% gain
(c) 33.33% loss (d) 40% loss

[SSC (GL) Prel. Examination, 2000]

47. By selling an article for ₹480 A lost 20%. For what should he sell it to make a profit of 20%?

- (a) ₹800 (b) ₹760
(c) ₹720 (d) ₹680

[SSC (GL) Prel. Examination, 2000]

48. A house worth ₹150000 is sold by X at 5% profit to Y. Y sells the house back to X at a 2% loss. Then, in the entire transaction:

- (a) X gains ₹4350 (b) X loses ₹4350
(c) X gains ₹3150 (d) X loses ₹3150

[SSC (GL) Prel. Examination, 2000]

49. A shopkeeper purchases 12 balloons for ₹10 and sells them at 10 balloons for ₹12. Thus, he earns a profit of:

- (a) 35% (b) 36%
(c) 44% (d) 45%

[SSC (GL) Prel. Examination, 2000]

50. Anu sold 2 books at ₹1.40 each. Her profit on one was 20% and her loss on the other was 20%. Then, she:

- (a) made no gain no loss (b) Gained 20 paise
(c) Lost 20 paise (d) lost 12 paise

[SSC (GL) Prel. Examination, 2000]

51. If I had purchased 11 articles for ₹10 and sold all articles at the rate of 10 for ₹11, the profit per cent would have been:

- (a) 10% (b) 11%
(c) 21% (d) 100%

[SSC (GL) Prel. Examination, 2002]

52. By selling an article for ₹72, there is a loss of 10%. In order to gain 5%, its selling price should be:

- (a) ₹87 (b) ₹85
(c) ₹80 (d) ₹84

[SSC (GL) Prel. Examination, 2002]

53. An article is sold at a loss of 10%. Had it been sold for ₹9 more, there would have been a gain of $12\frac{1}{2}$ % on it. The C.P. of the article is:

- (a) ₹40 (b) ₹45
(c) ₹50 (d) ₹35

[SSC (GL) Prel. Examination, 2002]

54. If C.P. is ₹80, overhead is ₹20 and S.P. is ₹120, then profit per cent is:

- (a) 20% (b) 50%
(c) 40% (d) 30%

[SSC (GL) Prel. Examination, 2002]

55. If S.P. of an article is $\frac{8}{5}$ times its C.P., the profit per cent on it is:

- (a) 120% (b) 160%
(c) 40% (d) 60%

[SSC (GL) Prel. Examination, 2002]

56. A man sells two articles at ₹99 each. On one he gains 10% and on the other he loses 10%. What is his gain or loss per cent in the whole transaction?

- (a) Loss, 1% (b) Loss, 1.5%
(c) Profit, 1% (d) Profit, 1.5%

[SSC (GL) Prel. Examination, 2002]

57. The cost price of 18 articles is equal to S.P. of 15 articles. The gain per cent is:

- (a) 15% (b) 20%
(c) 25% (d) 18%

[SSC (GL) Prel. Examination, 2002]

58. If a person sells a sari for ₹5200, making a profit of 30%, then the cost price of sari is:

- (a) ₹4420 (b) ₹4000
(c) ₹3900 (d) ₹3800

[SSC (GL) Prel. Examination, 2002]

59. The ratio of the cost price and the selling price is 4:5. The profit per cent is:

- (a) 10% (b) 20%
(c) 25% (d) 30%

[SSC (GL) Prel. Examination, 2002]

60. Two bicycles were sold for ₹3990 each, gaining 5% on one and losing 5% on the other. The gain or loss per cent on the whole transaction is:

- (a) neither gain nor loss (b) 2.5% gain
(c) 2.5% loss (d) 0.25% loss

[SSC (GL) Prel. Examination, 2002]

61. If the S.P. of 40 articles is equal to the C.P. of 50 articles, then the loss or gain per cent is:

- (a) 25% loss (b) 20% loss
(c) 25% gain (d) 20% gain

[SSC (GL) Prel. Examination, 2003]

62. A man bought a second hand machine for ₹1200 and spent ₹200 on its repairs. He sold it for ₹1680. His profit per cent is:

(a) 20% (b) 10%
(c) 8% (d) 16%

[SSC (GL) Prel. Examination, 2003]

63. An item costing ₹840 was sold by a shop-keeper at a gain of 10% and it was again sold by the new buyer at a loss of 5%. Find S.P. of the item:

(a) ₹877.80 (b) ₹798
(c) ₹924 (d) ₹37.80

[SSC (GL) Prel. Examination, 2003]

64. 100 oranges are bought for ₹350 and sold at the rate of ₹48 per dozen. The per cent of profit or loss is:

(a) 12% loss (b) 15% gain
(c) $14\frac{2}{7}\%$ loss (d) $14\frac{2}{7}\%$ profit

[SSC (GL) Prel. Examination, 2003]

65. A merchant fixes the sale price of his goods at 15% above the cost price. He sells his goods at 12% less than the fixed price. His percentage of profit is:

(a) $2\frac{1}{2}\%$ (b) $1\frac{1}{5}\%$
(c) $1\frac{1}{2}\%$ (d) 2%

[SSC (GL) Prel. Examination, 2003]

66. If the ratio of C.P. and S.P. is 5:6. The gain % is:

(a) 20% (b) $33\frac{1}{3}\%$
(c) 25% (d) 30%

[SSC (GL) Prel. Examination, 2003]

67. Ramesh bought a gas stove and paid 10% less than its original price. He sold it at 30% profit on the price he had paid what percentage of profit did Ramesh earn on the original price?

(a) 32% (b) 11%
(c) 20% (d) 17%

[IBPS JR. Executive, 2002]

68. A builder purchased a plot of land for ₹80 Lakhs and constructed a five storey building inclusive of ground floor on it. How much should he charge for each flat to make 25% profit on his investment on land, if there are five flats on each storey?

(a) ₹50000 (b) ₹100000
(c) ₹500000 (d) ₹2000000
(e) None of these

[IBPS JR. Executive, 2002]

69. 20% loss on selling price is what per cent loss on the cost price?

(a) 25% (b) $16\frac{2}{3}\%$
(c) 15% (d) $16\frac{1}{3}\%$

[SSC (GL), 2011]

70. X sells two articles for ₹4,000 each with no loss and no gain in the interaction. If one was sold at a gain of 25% the other is sold at a loss of:

(a) 25% (b) $18\frac{2}{9}\%$
(c) $16\frac{2}{3}\%$ (d) 20%

[SSC (GL), 2011]

71. A man purchased some eggs at 3 for ₹5 and sold them at 5 for ₹12. Thus, he gained ₹143 in all. The number of eggs he bought is:

(a) 210 (b) 200
(c) 195 (d) 190

[SSC (GL), 2011]

72. The cost price of an article is 64% of the marked price. The gain percentage after allowing a discount of 12% on the marked price is:

(a) 37.5% (b) 48%
(c) 50.5% (d) 52%

[SSC (GL), 2011]

73. By selling an article for ₹144, a person gained such that the percentage gain equals the cost price of the article. The cost price of the article is:

(a) ₹90 (b) ₹80
(c) ₹75 (d) ₹60

[SSC (GL), 2011]

74. A man sells two article for ₹5000 each neither losing nor gaining in the deal. If he sold one of them at a gain of 25%, the other article is sold at a loss of:

(a) $15\frac{2}{3}\%$ (b) $16\frac{2}{3}\%$
(c) $17\frac{1}{3}\%$ (d) $18\frac{1}{3}\%$

[SSC (GL), 2011]

75. A man bought orange at the rate of 8 for ₹34 and sold them at the rate of 12 for ₹57. How many oranges should be sold to earn a net profit of ₹45?

(a) 90 (b) 100
(c) 135 (d) 150

[SSC (GL), 2011]

9.16 Chapter 9

76. A shopkeeper allows 23% commission on his advertised price and still makes a profit of 10%. If he gains ₹56 on one item. His advertised price of the item, in ₹, is:

(a) 820 (b) 780
(c) 790 (d) 800

[SSC (GL), 2011]

77. A shopkeeper earns a profit of 12% on selling a book at 10% discount on the printed price. The ratio of the cost price and the printed price of the book is:

(a) 45:56 (b) 45:51
(c) 47:56 (d) 47:51

[SSC (GL), 2010]

78. On selling an article for ₹170, a shopkeeper loses 15%. In order to gain 20%, he must sell that article at rupees:

(a) 215.50 (b) 212.50
(c) 240 (d) 210

79. Seema purchased an item for ₹9600 and sold it for loss of 5 per cent. From that money she purchased another item and sold it for gain of 5 per cent. What is her overall gain/loss?

(a) Loss of ₹36 (b) Profit of ₹24
(c) Loss of ₹54 (d) None of these

[Bank of Baroda PO Examination, 2011]

80. By Selling 80 ball pens for ₹140, a retailer loses 30%. How many ball pens should he sell for ₹104 so as to make a profit of 30%?

(a) 32 (b) 52
(c) 48 (d) 42

81. What profit/loss per cent did Ravi earn if he purchased an item of ₹5600 and sold it at $\frac{3}{4}$ of its cost price?

(a) Loss of 20 per cent
(b) Gain of 25 per cent
(c) Neither gain nor loss
(d) None of these

[OBC PO Examination, 2010]

82. The profit earned after selling an article for ₹996 is the same as loss incurred after selling the article for ₹894. What is the cost price of the article?

(a) ₹935 (b) ₹905
(c) ₹945 (d) ₹975
(e) None of these

[SBI PO Examination, 2008]

83. Naresh purchased TV set of ₹11250 after getting discount of 10% on the labeled price. He spent ₹150 on transport and ₹800 on installation. At what price should it be sold so that the profit earned would have been 15% if no discount was offered?

(a) ₹12937.50 (b) ₹14030
(c) ₹13450 (d) ₹15467.50

[United Bank of India PO Examination, 2009]

84. A shopkeeper sells notebooks at the rate of ₹45 each and earns a commission of 4%. He also sells pencil box at the rate of ₹80 each and earns a commission of 20%. How much amount of commission will he earn in two weeks if he sells 10 notebooks and 6 pencil boxes a day?

(a) ₹1956 (b) ₹1586
(c) ₹1496 (d) ₹1596
(e) None of these

[CBI PO Examination, 2010]

85. A shopkeeper bought 30 Kg of wheat at the rate of ₹45 per Kg. He sold 40% of the total quantity at the rate of ₹50 per Kg. Approximately, at what price per Kg should he sell the remaining quantity to make 25 per cent overall profit?

(a) ₹54 (b) ₹52
(c) ₹50 (d) ₹60

[Allahabad Bank PO Examination, 2010]

86. A shopkeeper sold an item at 10% loss after giving a discount equal to half the marked price. The cost price of the item is:

(a) $\frac{1}{9}$ of marked price
(b) $\frac{4}{9}$ of marked price
(c) $\frac{5}{9}$ of marked price
(d) $\frac{7}{9}$ of marked price

[SSC, 2014]

87. A person purchased a saree for ₹7710 after availing a net discount of ₹1285. The percentage of discount, the saree-shop offers, is:

- (a) $14\frac{1}{7}\%$ (b) $14\frac{2}{7}\%$
 (c) $14\frac{3}{7}\%$ (d) $14\frac{4}{7}\%$

[SSC, 2014]

88. A cycle dealer offers a discount of 10% and still makes a profit of 26%. What does he pay for a cycle whose marked price is ₹840?

- (a) ₹600 (b) ₹650
 (c) ₹700 (d) ₹750

[SSC, 2014]

89. If the cost price of an item is $\frac{2}{5}$ of its marked price and if it is sold at a discount of 10%, then there will be:

- (a) 25% profit (b) 40% profit
 (c) 50% profit (d) 125% profit

[SSC, 2014]

90. An item costing ₹200 is being sold at 10% loss. If the price is further reduced by 5%, the selling price will be:

- (a) ₹170 (b) ₹171
 (c) ₹175 (d) ₹179

[SSC, 2014]

91. A shopkeeper buys 144 items at 90 paise each. On the way 20 items are broken. He sells the remainder at ₹1.20 each. His gain per cent correct to one place of decimal is:

- (a) 13.8% (b) 14.6%
 (c) 14.8% (d) 15.8%

[SSC, 2014]

92. There is a profit of 20% on the cost price of an article. The per cent of profit, when calculated on selling price is:

- (a) $16\frac{2}{3}\%$ (b) 20%
 (c) $33\frac{1}{3}\%$ (d) None of these

[SSC, 2014]

93. By selling an article for ₹102, there is a loss of 15%. When the article is sold for ₹134.40, the net result in the transaction is:

- (a) 12% gain (b) 12% loss
 (c) 10% loss (d) 15% gain

[SSC, 2014]

94. Two toys are sold at ₹504 each. One toy brings the dealer a gain of 12% and the other a loss of 4%. The gain or loss per cent by selling both the toys is:

- (a) $3\frac{5}{13}\%$ Profit (b) $4\frac{5}{13}\%$ Profit
 (c) $5\frac{1}{13}\%$ Profit (d) $2\frac{3}{13}\%$ Loss

[SSC, 2014]

95. A sold a horse to B for ₹4800 by losing 20%. B sells it to C at a price which would have given A a profit of 15%. B's gain is:

- (a) ₹1800 (b) ₹1900
 (c) ₹2000 (d) ₹2100

[SSC, 2014]

96. A reduction of 21% in the price of an item enables a person to buy 3 Kg more for ₹100. The reduced price of the item per Kg is:

- (a) ₹5.50 (b) ₹7.50
 (c) ₹10.50 (d) ₹7.00

[SSC, 2014]

97. A tradesman marks his goods 30% more than the cost price. If he allows a discount of $6\frac{1}{4}\%$ then his gain per cent is:

- (a) $23\frac{3}{4}\%$ (b) 22%
 (c) $21\frac{7}{8}\%$ (d) 30%

[SSC, 2013]

98. A shopkeeper purchased a chair marked at ₹600 at two successive discounts of 15% and 20%. He spent ₹28 on transportation and sold the chair for ₹545. His gain per cent was:

- (a) 25% (b) 30%
 (c) 35% (d) 20%

[SSC, 2013]

99. The marked price of a piano was ₹15,000. At the time of sale, there were successive discounts of 20% 10% and 10% on it. The sale price was:

- (a) ₹9,720 (b) ₹9,750
 (c) ₹9,760 (d) ₹9,780

[SSC, 2013]

100. By selling 25 metres of cloth a trader gains the selling price of 5 metres of cloth. The gain of the trader in % is:

- (a) 25 (b) 20
 (c) 28 (d) 29

[SSC, 2013]

101. A sells a suitcase to B at 10% profit. B sells it to C at 30% profit. If C pays ₹2,860 for it, then the price at which A bought it is:

- (a) ₹1,000 (b) ₹1,600
(c) ₹2,000 (d) ₹2,500

[SSC, 2013]

102. Gita buys a plot of land for ₹96,000. She sells $\frac{2}{5}$ of it at a loss of 6%. She wants to make a profit of 10% on the whole transaction by selling the remaining land. The gain percentage on the remaining land is:

- (a) 20 (b) $20\frac{2}{3}$
(c) 14 (d) 7

[SSC, 2013]

103. An article is sold at a gain of 15%. Had it been sold for ₹27 more, the profit would have been 20%. The cost price of the article is:

- (a) ₹500 (b) ₹700
(c) ₹540 (d) ₹545

[SSC, 2013]

104. On selling 17 balls at ₹720, there is a loss equal to the cost price of 5 balls. The cost price of a ball is:

- (a) 45 (b) 50
(c) 55 (d) 60

[SSC, 2013]

105. Two items A and B are sold at a profit of 10% and 15%, respectively. If the amount of profit received is the same, then the cost price of A and B may be:

- (a) ₹1,000, ₹1,500 (b) ₹5,000, ₹2,000
(c) ₹3,000, ₹2,000 (d) ₹3,000, ₹5,000

[SSC, 2013]

106. Arun marks up the computer he is selling by 20% profit and sells them at a discount of 15%. Arun's net gain per cent is:

- (a) 4 (b) 2
(c) 3.5 (d) 2.5

[SSC Assistant Grade III, 2013]

107. A dealer buys a table listed at ₹1,500 and gets successive discounts of 20% and 10%. He spends ₹20 on transportation and sells at a profit of 20%. Find the selling price of the table.

- (a) ₹1,320 (b) ₹1,080
(c) ₹1,200 (d) ₹1,230

[SSC Assistant Grade III, 2013]

108. A sells an article to B at a gain of 20% and B sells it to C at a gain of 10% and C sells it to D at a gain of $12\frac{1}{2}\%$. If D pays ₹29.70, then A purchased the article for:

- (a) ₹40 (b) ₹10
(c) ₹20 (d) ₹30

[SSC Assistant Grade III, 2013]

109. By selling 80 ball pens for ₹140 a retailer loses 30%. How many ball pens should he sell for ₹104 so as to make a profit of 30%?

- (a) 32 (b) 52
(c) 48 (d) 42

[SSC Assistant Grade III, 2013]

110. A discount of 40% on the marked price of a trouser enables Ajit to purchase a shirt also which costs him ₹320. How much did Ajit pay for the trouser?

- (a) ₹ 480 (b) ₹ 540
(c) ₹ 800 (d) ₹ 400

[SSC Assistant Grade III, 2012]

111. Rahim bought a gift item for ₹510 after getting a discount of 15%. He then sells it 5% above the marked price. The profit earned in this deal is:

- (a) ₹150 (b) ₹120
(c) ₹100 (d) ₹90

[SSC Assistant Grade III, 2012]

112. A shopkeeper marks his goods at 40% above their cost price. He is able to sell $\frac{3}{4}$ of his goods at this price, and the remaining at 40% discount. Assuming that the shopkeeper is able to sell the goods he buys, find his loss or gain as % of the whole transaction.

- (a) 20% loss (b) 23% loss
(c) 26% gain (d) 30% gain

[SSC Assistant Grade III, 2012]

113. A fruit seller bought 240 bananas at the rate of ₹48 per dozen. He sells half of them at the rate of ₹5 per banana, $\frac{1}{6}$ of the remaining are found to be rotten. The price per banana at which he has to sell the remaining bananas to get a profit of 25% on his entire investment is:

- (a) ₹5.5 (b) ₹6.0
(c) ₹5.0 (d) ₹6.5

[SSC Assistant Grade III, 2012]

114. A and B started a business by investing ₹3,50,000 and ₹1,40,000 respectively. A gets 20% of the yearly profit for managing the business. Thereafter the profit is divided in the ratio of the capital. If A receives totally ₹38,000 more than B at the end of a year, then the profit is:

- (a) ₹28,000 (b) ₹2,80,000
(c) ₹1,05,000 (d) ₹70,000

[SSC, 2012]

- 115.** A fan in a shop is offered at a discount of 10%. It is sold during clearance sale at 6% discount over the already discounted price at ₹846. The original marked price of the fan is:
 (a) ₹1000 (b) ₹900
 (c) ₹850 (d) ₹896
[SSC, 2012]
- 116.** A trader allows a trade discount of 20% and a cash discount of $6\frac{1}{4}\%$ on the marked price of the goods and gets a net gain of 20% of the cost. By how much above the cost should the goods be marked for the sale?
 (a) 40% (b) 50%
 (c) 60% (d) 70%
[SSC, 2012]
- 117.** A discount series of 10%, 20% and 40% is equal to a single discount of:
 (a) 56.80% (b) 50%
 (c) 70% (d) 43.20%
[SSC, 2012]
- 118.** Tarun bought a TV with 20% discount on the labelled price. Had he bought it with 25% discount, he would have saved ₹500. At what price did he buy the TV?
 (a) ₹7,500 (b) ₹8,500
 (c) ₹8,000 (d) ₹7,400
[SSC, 2012]
- 119.** A manufacturer sells an article to a wholesale dealer at a profit of 10%. The wholesale dealer sells it to a shopkeeper at 20% profit. The shopkeeper sells it to a customer for ₹56,100 at a loss of 15%. Then the cost price of the article to the manufacturer is:
 (a) ₹25,000 (b) ₹10,000
 (c) ₹50,000 (d) ₹55,000
[SSC, 2012]
- 120.** A loss of 19% gets converted into a profit of 17% when the selling price is increased by ₹162. The cost price of the article is:
 (a) ₹450 (b) ₹600
 (c) ₹360 (d) ₹540
[SSC, 2012]
- 121.** A man purchased 150 pens at the rate of ₹12 per pen. He sold 50 pens at gain of 10%. The percentage gain at which he must sell the remaining pens so as to gain 15% on the whole outlay is:
 (a) $21\frac{1}{2}\%$ (b) 20%
 (c) 17% (d) $17\frac{1}{2}\%$
[SSC, 2012]
- 122.** A dealer sold two types of goods for ₹10,000 each. On one of them, he lost 20% and on the other he gained 20%. His gain or loss per cent in the entire transaction was:
 (a) 2% loss (b) 2% gain
 (c) 4% gain (d) 4% loss
[SSC, 2012]
- 123.** The cost price of 40 articles is the same as the selling price of 25 articles. Find the gain per cent.
 (a) 65% (b) 60%
 (c) 15% (d) 75%
[SSC, 2012]
- 124.** A sells an article to B making a profit of $\frac{1}{5}$ th his outlay. B sells it to C, gaining 20%. If C sells it for ₹600 and incurs a loss of $\frac{1}{6}$ th his outlay, the cost price of A is:
 (a) ₹600 (b) ₹500
 (c) ₹720 (d) ₹800
[SSC, 2012]
- 125.** A man had a certain amount with him. He spent 20% of that to buy an article and 5% of the remaining on transport. Then he gifted ₹120. If he is left with ₹1,400, the amount he spent on transport is:
 (a) ₹76 (b) ₹61
 (c) ₹95 (d) ₹80
[SSC, 2012]
- 126.** By selling an article at $\frac{3}{4}$ th of the marked price, there is gain of 25%. The ratio of the marked price and the cost price is:
 (a) 5:3 (b) 3:5
 (c) 3:4 (d) 4:3
[SSC, 2011]
- 127.** Successive discounts of 10%, 20% and 50% will be equivalent to a single discount of:
 (a) 36% (b) 64%
 (c) 80% (d) 56%
[SSC, 2011]
- 128.** A retailer offers the following discount schemes for buyers on an article:
 I. Two successive discounts of 10%.
 II. A discount of 12% followed by a discount of 8%.
 III. Successive discounts of 15% and 5%.
 IV. A discount of 20%.

The selling price will be minimum under the scheme

- (a) I (b) II
(c) III (d) IV

[SSC, 2011]

129. The value of an article depreciates every year at the rate of 10% of its value. If the present value of the article is ₹729, then its worth 3 years ago was:

- (a) ₹1250 (b) ₹1000
(c) ₹1125 (d) ₹1200

[SSC, 2011]

130. Nitin bought some oranges at ₹40 a dozen and an equal number at ₹30 a dozen. He sold them at ₹45 a dozen and made a profit of ₹480. The number of oranges, he bought, was:

- (a) 48 (b) 60
(c) 72 (d) 84

[SSC, 2011]

131. A man buys two chairs for a total cost of ₹900. By selling one for $\frac{4}{5}$ of its cost and the other for $\frac{5}{4}$ of its cost, he makes a profit of ₹90 on the whole transaction. The cost of the lower priced chair is:

- (a) ₹360 (b) ₹400
(c) ₹420 (d) ₹300

[SSC, 2011]

132. By selling 100 oranges, a vendor gains the selling price of 20 oranges. He gain per cent is:

- (a) 20 (b) 25
(c) 30 (d) 32

[SSC, 2011]

133. 60% of the cost price of an article is equal to 50% of its selling price. Then the percentage of profit or loss on the cost price is:

- (a) 20% loss (b) $16\frac{2}{3}\%$ profit
(c) 20% profit (d) 10% loss

[SSC, 2011]

134. Maninder bought two horses at ₹40,000 each. He sold one horse at 15% gain, but had to sell the second horse at a loss. If he had suffered a loss of ₹3,600 on the whole transaction, then the selling price of the second horse is:

- (a) ₹30,000 (b) ₹30,200
(c) ₹30,300 (d) ₹30,400

[SSC, 2011]

135. A fruit-seller buys x guavas for ₹ y and sells y guavas for ₹ x . If $x > y$, then he made:

- (a) $\frac{x^2 - y^2}{xy}\%$ loss (b) $\frac{x^2 - y^2}{xy}\%$ gain
(c) $\frac{x^2 - y^2}{y^2}\%$ loss (d) $\frac{x^2 - y^2}{y^2} \times 100\%$ gain

[SSC, 2011]

136. A person sold a horse at a gain of 15%. Had he bought it for 25% less and sold it for ₹60 less, he would have made a profit of 32%. The cost price of the horse was:

- (a) ₹370 (b) ₹372
(c) ₹375 (d) ₹378

[SSC, 2010]

137. A sells an article to B at a gain of 25%, B sells it to C at a gain 20% and C sells it to D at a gain of 10%. If D pays ₹330 for it, how much did it cost A?

- (a) ₹200 (b) ₹250
(c) ₹275 (d) ₹290

[SSC, 2010]

138. By selling an article for ₹21, a man lost such that the percentage loss was equal to the cost price. The cost price of the article was:

- (a) ₹30 or ₹70 (b) ₹35 or ₹60
(c) ₹45 (d) ₹50

[SSC, 2010]

139. Half of 100 articles were sold at a profit of 20% and the rest at a profit of 40%. If all of the articles had been sold at a profit of 25%, the total profit would have been ₹100 less than earlier profit. The cost price of each article was:

- (a) ₹10 (b) ₹15
(c) ₹20 (d) ₹30

[SSC, 2010]

140. The marked price of a clock is ₹3200. It is to be sold at ₹2448 at two successive discounts. If the first discount is 10%, then the second discount is:

- (a) 5% (b) 10%
(c) 15% (d) 20%

[SSC, 2010]

141. A dealer marks his goods 30% above his cost price and then allows 15% discount on it. What is the cost price of an article on which he gains ₹84?

- (a) ₹800 (b) ₹560
(c) ₹373.33 (d) ₹280

[SSC, 2010]

142. A shopkeeper wishes to give 5% commission on the marked price of an article but also wants to earn

a profit of 10%. If his cost price is ₹95, then the marked price is:

- (a) ₹100 (b) ₹110
(c) ₹120 (d) ₹130

[SSC, 2010]

143. A shopkeeper sells sugar in such a way that the selling price of 950 g of sugar is the same as the cost price of 1 Kg of sugar. What is his gain per cent?

- (a) $5\frac{5}{19}$ (b) $5\frac{1}{5}$
(c) 5 (d) $4\frac{1}{19}$

[SSC, 2010]

144. A person bought a horse and a carriage for ₹20000. Later, he sold the horse at 20% profit and the carriage at 10% loss. Thus, he gained 2% in the whole transaction. The cost price of the horse was:

- (a) ₹7200 (b) ₹7500
(c) ₹8000 (d) ₹9000

[SSC, 2010]

145. A sells an article to B at 15% profit. B sells it to C at 10% loss. If C pays ₹517.50 for it then A purchased it at:

- (a) ₹500 (b) ₹750
(c) ₹1000 (d) ₹1250

[SSC, 2010]

146. An article is sold at a certain fixed price. By selling it at $\frac{2}{3}$ of that price, one loses 10%. The gain per cent on selling it at the original price is:

- (a) 20 (b) $33\frac{1}{3}$
(c) 35 (d) 40

[SSC, 2010]

147. A sells an article to B for ₹45,000 losing 10% in the transaction. B sells it to C at a price which would have given a profit of 10% to A. By what per cent does B gain?

- (a) $\frac{75}{2}$ (b) $\frac{100}{3}$
(c) $\frac{200}{9}$ (d) $\frac{150}{7}$

[SSC, 2010]

148. The cost price of an article is 80% of its marked price for sale. How much per cent does the tradesman gain after allowing a discount of 12%?

- (a) 20 (b) 12
(c) 10 (d) 8

[SSC, 2010]

149. A merchant purchases a wrist watch for ₹450 and fixes its list price in such a way that after allowing a discount of 10%, he earns a profit of 20%. Then the list price (in rupees) of the wrist watch is:

- (a) ₹500 (b) ₹600
(c) ₹750 (d) ₹800

[SSC, 2010]

150. A, B, C are partners in a business. During a particular year, A received one third of the profit, B received $\frac{1}{4}$ of the profit and C received the remaining ₹5000. How much amount of money did A receive?

- (a) ₹1000 (b) ₹3000
(c) ₹4000 (d) ₹5000

[SSC, 2010]

151. A bakery bakes cake with the expectation that it will earn a profit of 40% by selling each cake at marked price. But during the delivery to showroom 16% of the cakes were completely damaged and hence could not be sold. 24% of the cakes were slightly damaged and hence could be sold at 80% of the cost price. The remaining 60% of the cakes were sold at marked price. What is the percentage profit in the whole consignment?

- (a) 3.2 (b) 2.4
(c) 2.8 (d) 4.2
(e) 3.6

[IBPS PO/MT, 2014]

152. A shopkeeper sells two watches for ₹308 each. On one watch he earns 12% profit and on the others he suffers 12% loss. His profit or loss in the entire transaction was:

- (a) $1\frac{11}{25}\%$ loss (b) $1\frac{11}{25}\%$ gain
(c) $3\frac{2}{25}\%$ loss (d) $3\frac{2}{25}\%$ gain
(e) None of these

[IBPS PO/MT, 2013]

153. An article was purchased for ₹78,350. Its price was marked up by 30%. It was sold at a discount of 20% on the marked-up price. What was the profit per cent on the cost price?

- (a) 4% (b) 7%
(c) 5% (d) 3%
(e) 6%

[IBPS PO/MT, 2012]

154. Profit earned by an organization is distributed among officers and clerks in the ratio of 5:3. If the number of officers is 45 and the number of clerks is 80 and the amount received by each officer is ₹25,000, what was the total amount of profit earned?

(a) ₹22 Lakhs (b) ₹18.25 Lakhs
(c) ₹18 Lakhs (d) ₹23.25 Lakhs
(e) None of these

[SBI Associates Banks PO, 2011]

155. A shopkeeper labeled the price of his articles in order to earn a profit of 30% on the cost price. He, then, sold the articles by offering a discount of 10% on the labelled price. What is the actual rate of profit he earned in the deal?

(a) 18% (b) 15%
(c) 20% (d) Cannot be determined
(e) None of these

[SBI Associates Banks PO, 2011]

156. Kamya purchased an item for ₹46,000 and sold it at a loss of 12 per cent. With that amount she purchased another item which he sold at a gain of 12%. What was her overall gain/loss?

(a) Loss of ₹662.40 (b) Profit of ₹662.40
(c) Loss of ₹642.80 (d) Profit of ₹642.80
(e) None of these

[Allahabad Bank PO, 2011]

157. Rehaan purchased a bike for ₹54,000. He sold it at a loss of 8%. With that money, he again purchased another bike and sold that at a profit of 10 per cent. What is his overall loss/profit?

(a) loss ₹657 (b) profit ₹567
(c) loss ₹648 (d) profit ₹648
(e) None of these

[Corporation Bank PO, 2011]

158. A shopkeeper sells notebooks at the rate of ₹457 each and earns a commission of 4%. He also sells pencil boxes at the rate of ₹80 each and earns a commission of 20%. How much amount of commission will he earn in two weeks if he sells 10 notebooks and 6 pencil boxes a day?

(a) ₹1,956 (b) ₹1,586
(c) ₹1,496 (d) ₹1,596
(e) None of these

[CBI PO, 2010]

159. Meenal purchased a car for ₹2,50,000 and sold it for ₹3,48,000. What is the per cent profit she made on the car?

(a) 40 (b) 39.2
(c) 38.4 (d) 38
(e) None of these

[Corporation Bank PO, 2010]

160. A shopkeeper bought 30 Kg of wheat at the rate of ₹45 per Kg. He sold 40% of the total quantity at the rate of ₹50 per Kg. Approximately, at what price per Kg should he sell the remaining quantity to make 25 per cent overall profit?

(a) ₹54 (b) ₹52
(c) ₹50 (d) ₹60
(e) ₹56

[Allahabad Bank PO, 2010]

161. The profit earned after selling a wrist watch for ₹4,080 is the same as the loss incurred after selling the same wrist watch for ₹3,650. What is the cost price of the wrist watch?

(a) ₹3,785 (b) ₹3,800
(c) ₹3,775 (d) ₹3,865
(e) None of these

[NABARD Bank Officer, 2009]

ANSWER KEYS**EXERCISE-I**

1. (b) 2. (a) 3. (b) 4. (c) 5. (a) 6. (c) 7. (a) 8. (b) 9. (c) 10. (a) 11. (c) 12. (a) 13. (b)
 14. (c) 15. (b) 16. (a) 17. (b) 18. (c) 19. (b) 20. (a) 21. (c) 22. (a) 23. (b) 24. (a) 25. (a) 26. (b)
 27. (a) 28. (c) 29. (b) 30. (c) 31. (c) 32. (a) 33. (c) 34. (b) 35. (a) 36. (c) 37. (c) 38. (a) 39. (c)
 40. (a) 41. (b) 42. (a)

EXERCISE-2

1. (c) 2. (b) 3. (d) 4. (c) 5. (c) 6. (c) 7. (d) 8. (c) 9. (a) 10. (b) 11. (d) 12. (b) 13. (e)
 14. (c) 15. (b) 16. (c) 17. (a) 18. (a) 19. (c) 20. (e) 21. (d) 22. (b) 23. (c) 24. (b) 25. (c) 26. (c)
 27. (d) 28. (c) 29. (a) 30. (c) 31. (c) 32. (a) 33. (b) 34. (c) 35. (c) 36. (c) 37. (c) 38. (c) 39. (c)
 40. (b) 41. (d) 42. (b) 43. (a) 44. (d) 45. (c) 46. (d) 47. (c) 48. (a) 49. (c) 50. (d) 51. (a) 52. (d)
 53. (a) 54. (a) 55. (d) 56. (a) 57. (b) 58. (b) 59. (c) 60. (d) 61. (c) 62. (a) 63. (a) 64. (d) 65. (b)
 66. (a) 67. (d) 68. (d) 69. (b) 70. (d) 71. (c) 72. (a) 73. (b) 74. (b) 75. (a) 76. (d) 77. (a) 78. (c)
 79. (d) 80. (a) 81. (d) 82. (c) 83. (b) 84. (d) 85. (d) 86. (c) 87. (b) 88. (a) 89. (d) 90. (b) 91. (c)
 92. (a) 93. (a) 94. (a) 95. (d) 96. (d) 97. (c) 98. (a) 99. (a) 100. (a) 101. (c) 102. (b) 103. (c) 104. (d)
 105. (c) 106. (b) 107. (a) 108. (c) 109. (a) 110. (a) 111. (b) 112. (c) 113. (b) 114. (d) 115. (a) 116. (c) 117. (a)
 118. (c) 119. (c) 120. (a) 121. (d) 122. (d) 123. (b) 124. (b) 125. (d) 126. (a) 127. (b) 128. (d) 129. (b) 130. (a)
 131. (d) 132. (b) 133. (c) 134. (d) 135. (d) 136. (c) 137. (a) 138. (a) 139. (c) 140. (c) 141. (a) 142. (b) 143. (a)
 144. (c) 145. (a) 146. (c) 147. (c) 148. (c) 149. (b) 150. (c) 151. (a) 152. (a) 153. (a) 154. (d) 155. (e) 156. (a)
 157. (d) 158. (e) 159. (b) 160. (d) 161. (d)

EXPLANATORY ANSWERS**EXERCISE-I**

1. (b) Here, C.P. = ₹350, S.P. = ₹392

$$\text{Profit} = \text{S.P.} - \text{C.P.} = 392 - 350 = ₹42.$$

$$\therefore \text{Profit \%} = \frac{\text{Profit} \times 100}{\text{C.P.}} = \frac{42 \times 100}{350} = 12\%$$

2. (a) C.P. of the bicycle = 5200 + 800 = ₹6000

S.P. = ₹5500. Since S.P. < C.P.,

$$\therefore \text{Loss} = \text{C.P.} - \text{S.P.} = 6000 - 5500 = ₹500.$$

$$\therefore \text{Loss \%} = \frac{\text{Loss} \times 100}{\text{C.P.}} = \frac{500 \times 100}{6000}$$

$$= \frac{25}{3}\% \text{ or } 8\frac{1}{3}\%$$

3. (b) Cost price of 10 articles (C.P.) = ₹8.

$$\text{Selling price of 10 articles (S.P.)} = 1.25 \times 10$$

$$= ₹12.50$$

$$\text{Profit} = \text{S.P.} - \text{C.P.} = 12.50 - 8 = ₹4.50.$$

$$\therefore \text{Gain \%} = \frac{\text{Gain} \times 100}{\text{C.P.}} = \frac{4.50 \times 100}{8} = 56\frac{1}{4}\%$$

4. (c) Marked price (M.P.) = ₹80.

$$\text{Selling price (S.P.)} = ₹68.$$

$$\text{Discount} = \text{M.P.} - \text{S.P.} = 80 - 68 = ₹12.$$

$$\therefore \text{Rate of discount} = \frac{\text{Discount} \times 100}{\text{Marked Price}} = \frac{12 \times 100}{80} = 15\%$$

9.24 Chapter 9

5. (a) Cost price of 200 dozen oranges = $200 \times 10 = ₹2000$
Transportation cost = ₹500.

$$\therefore \text{Cost Price (C.P.)} = 2000 + 500 = ₹2500.$$

$$\text{Selling Price (S.P.)} = 200 \times 12 \times 1 = ₹2400.$$

$$\text{Loss} = \text{C.P.} - \text{S.P.} = 2500 - 2400 = ₹100.$$

$$\therefore \text{Loss \%} = \frac{\text{Loss} \times 100}{\text{C.P.}} = \frac{100 \times 100}{2500} = 4\%$$

6. (c) We have, S.P. = ₹10500, gain % = 5%

$$\therefore \text{C.P.} = \left(\frac{100}{100 + \text{Gain\%}} \right) \times \text{S.P.}$$

$$= \left(\frac{100}{100 + 5} \right) \times 10500$$

$$= \frac{100}{105} \times 10500 = ₹10000.$$

7. (a) Here, C.P. = ₹1800, loss % = 10%

$$\therefore \text{S.P.} = \left(\frac{100 - \text{Loss\%}}{100} \right) \times \text{C.P.}$$

$$= \left(\frac{100 - 10}{100} \right) \times 1800$$

$$= \frac{90}{100} \times 1800 = ₹1620.$$

8. (b) We have,

$$\text{Cost price (C.P.)} = (120 \times 80 + 280 + 72 + 120 \times 40) = ₹10000.$$

$$\text{Gain \%} = 8\%$$

$$\therefore \text{Selling Price (S.P.) of 120 rims}$$

$$= \left(\frac{100 + \text{Gain\%}}{100} \right) \times \text{C.P.}$$

$$= \left(\frac{100 + 8}{100} \right) \times 10000$$

$$= \frac{108}{100} \times 10000 = ₹10800.$$

$$\text{Thus, selling price per rim} = \frac{10800}{120} = ₹90.$$

9. (c) In the first case, S.P. = ₹31 and loss % = 7%

$$\therefore \text{C.P.} = \left(\frac{100}{100 - \text{Loss\%}} \right) \times \text{S.P.} = \left(\frac{100}{100 - 7} \right) \times 31$$

$$= \frac{100}{93} \times 31 = ₹33\frac{1}{3}.$$

$$\text{In the second case, C.P.} = ₹33\frac{1}{3} \text{ and gain \%} = 5\%$$

$$\therefore \text{S.P.} = \left(\frac{100 + \text{Gain\%}}{100} \right) \times \text{C.P.}$$

$$= \left(\frac{100 + 5}{100} \right) \times \frac{100}{3} = \frac{105}{100} \times \frac{100}{3} = ₹35.$$

10. (a) In the first case, we have, S.P. = ₹35 and gain % = 40%

$$\therefore \text{C.P.} = \left(\frac{100}{100 + \text{Gain\%}} \right) \times \text{S.P.}$$

$$= \left(\frac{100}{100 + 40} \right) \times 35$$

$$= \frac{100}{140} \times 35 = ₹25.$$

In the second case, C.P. = ₹25 and gain % = 60%

$$\therefore \text{S.P.} = \left(\frac{100 + \text{Gain\%}}{100} \right) \times \text{C.P.}$$

$$= \left(\frac{100 + 60}{100} \right) \times 25$$

$$= \frac{160}{100} \times 25 = ₹40.$$

11. (c) Quantity Price

$$\begin{array}{cc} 6 & 20 \\ & \times \\ 6 & 16 \end{array}$$

$$\% \text{ profit} = \left(\frac{xw}{zy} - 1 \right) \times 100\% = \left(\frac{6 \times 16}{4 \times 20} \right) \times 100\%$$

$$= \frac{16}{80} \times 100\%$$

$$= 20\%$$

12. (a) Quantity Price

$$\begin{array}{cc} 106 & 14 \\ & \times \\ 12 & 15 \end{array}$$

$$\% \text{ gain or loss} = \left(\frac{xw}{zy} - 1 \right) \times 100\%$$

$$= \left(\frac{10 \times 15}{12 \times 14} - 1 \right) \times 100\%$$

$$= \left(\frac{150}{168} - 1 \right) \times 100\%$$

$$= -\frac{18}{168} \times 100\% = -10\frac{5}{7}\%$$

Since the sign is -ve, since there is a loss of $10\frac{5}{7}\%$.

13. (b) Quantity Price

$$\begin{array}{cc} 12 & 10 \\ & \times \\ 10 & 12 \end{array}$$

$$\% \text{ gain or loss} = \left(\frac{xw}{zy} - 1 \right) \times 100\%$$

$$= \left(\frac{12 \times 12}{10 \times 10} - 1 \right) \times 100\% = \left(\frac{144}{100} - 1 \right) \times 100\%$$

$$= \frac{44}{100} \times 100\% = 44\%$$

Since the sign is +ve, therefore there is a profit of 44%.

14. (c) Here, $m = 21$, $n = 18$.

$$\begin{aligned} \therefore \text{Gain \%} &= \left(\frac{m-n}{n} \right) \times 100 = \left(\frac{21-18}{18} \right) \times 100 \\ &= \left(\frac{3}{18} \times 100 \right) \% = 16\frac{2}{3}\% \end{aligned}$$

15. (b) Here, $m = 48$, $n = 40$.

$$\begin{aligned} \therefore \text{Gain \%} &= \left(\frac{m-n}{n} \right) \times 100 = \left(\frac{48-40}{40} \right) \times 100 \\ &= \frac{8}{40} \times 100 = 20\% \end{aligned}$$

16. (a) Let, the quantity of milk be x litre.

$$\text{Then, } m = x, n = \frac{2}{3}x.$$

$$\begin{aligned} \therefore \text{Gain \%} &= \left(\frac{m-n}{n} \right) \times 100 = \left(\frac{x - \frac{2}{3}x}{\frac{2}{3}x} \right) \times 100 \\ &= \frac{1}{2} \times 100 = 50\% \end{aligned}$$

17. (b) Here, $m = 25$, $n = 20$.

$$\begin{aligned} \therefore \% \text{ gain} &= \left(\frac{m-n}{n} \right) \times 100 = \left(\frac{25-20}{20} \right) \times 100 \\ &= 25\% \end{aligned}$$

18. (c) Here, $S.P._1 = ₹1230$, $x = -18$,

$$S.P._2 = ₹1600, y = ?$$

Using the formula,

$$\frac{S.P._1}{100+x} = \frac{S.P._2}{100+y}$$

$$\text{we get, } \frac{1230}{100-18} = \frac{1600}{100+y}$$

$$\Rightarrow 100+y = \frac{1600 \times 82}{1230} = 106\frac{2}{3} \Rightarrow y = 6\frac{2}{3}\% = 6\frac{2}{3}\%$$

Thus, Mohit has a gain of $6\frac{2}{3}\%$ by selling it for ₹1600.

19. (b) Here, $S.P._1 - S.P._2 = ₹180$, $x = 10$, $y = -20$,
C.P. = ?

$$\text{Using the formula, } \frac{C.P.}{100} = \frac{S.P._1 - S.P._2}{x-y}$$

$$\text{we get, } C.P. = \left(\frac{180}{10+20} \right) \times 100 = \frac{180}{30} \times 100 = ₹600.$$

20. (a) We have,

$$\begin{aligned} S.P._1 &= \text{Selling price of one orange} = ₹\frac{1}{36}, \\ x &= -4, y = 8. \end{aligned}$$

$$\text{Using the formula, } \frac{S.P._1}{100+x} = \frac{S.P._2}{100+y}$$

$$\text{we get, } \frac{1/36}{100-4} = \frac{S.P._2}{100+8} \Rightarrow S.P._2 = \frac{108}{96} \times \frac{1}{36} = \frac{1}{32}.$$

21. (c) Here, $S.P._1 - S.P._2 = -1494$, $x = -10$, $y = \frac{25}{2}$.

Using the formula,

$$\frac{C.P.}{100} = \frac{S.P._1 - S.P._2}{x-y}$$

$$\text{we get, } \frac{C.P.}{100} = \frac{-1494}{-10-25/2} = \frac{1494}{45/2}$$

$$\Rightarrow C.P. = \frac{1494 \times 2 \times 100}{45} = ₹6640.$$

22. (a) Here, $S.P._1 - S.P._2 = -72$, $x = 5$, $y = 13$.

Using the formula,

$$\frac{C.P.}{100} = \left(\frac{S.P._1 - S.P._2}{x-y} \right)$$

$$\text{we get, } \frac{C.P.}{100} = \left(\frac{-72}{5-13} \right)$$

$$\Rightarrow C.P. = \frac{72}{8} \times 100 = ₹900.$$

23. (b) Here, $m = 17$, $n = -25$, $z = ₹1842.75$.

\therefore Cost price of calculator to Sita

$$= \left[\frac{100^2 z}{(100+m)(100+n)} \right] = \frac{100 \times 100 \times 1842.75}{(100+17)(100-25)}$$

$$= \frac{100 \times 100 \times 1842.75}{117 \times 75} = ₹2100.$$

24. (a) We have, $m = 10$, $n = 20$, $z = ₹924$.

\therefore Cost price of A

$$= \left[\frac{100^2 z}{(100+m)(100+n)} \right]$$

$$= \left[\frac{100 \times 100 \times 924}{(100+10)(100+20)} \right] = \frac{100 \times 100 \times 924}{110 \times 120}$$

$$= ₹700.$$

25. (a) Here, $m = 20$, $n = 10$, $p = \frac{25}{2}$,

$$z = ₹29.70.$$

\therefore Cost price of A

$$= \left[\frac{100^3 z}{(100+m)(100+n)(100+p)} \right]$$

$$= \left(\frac{100 \times 100 \times 100 \times 29.70 \times 2}{120 \times 110 \times 225} \right)$$

$$= \left(\frac{100 \times 100 \times 100 \times 29.70 \times 2}{120 \times 110 \times 225} \right) = ₹20.$$

26. (b) We have, $m = -10$, $n = -20$, $z = ₹1440$.

\therefore Cost price of tape-recorder for Rajesh

$$\begin{aligned}
 &= \left[\frac{100^2 z}{(100+m)(100+n)} \right] \\
 &= \left[\frac{100 \times 100 \times 1440}{(100-10)(100-20)} \right] \\
 &= ₹2000.
 \end{aligned}$$

27. (a) Here, $m = -10$, $n = 20$, $z = ₹54000$.

∴ Actual cost price of the scooter

$$\begin{aligned}
 &= \left[\frac{100^2 z}{(100+m)(100+n)} \right] \\
 &= \left[\frac{100 \times 100 \times 54000}{(100-10)(100+20)} \right] \\
 &= \left(\frac{100 \times 100 \times 54000}{90 \times 120} \right) = ₹50000.
 \end{aligned}$$

28. (c) We have, $m = 10$, $n = 20$.

$$\begin{aligned}
 \therefore \text{Resultant profit \%} &= \left(m + n + \frac{mn}{100} \right) \\
 &= \left(10 + 20 + \frac{10 \times 20}{100} \right) \\
 &= 32\%
 \end{aligned}$$

29. (b) Here, $m = 20$, $n = -5$

$$\begin{aligned}
 \therefore \text{Resultant profit or loss \%} &= \left(m + n + \frac{mn}{100} \right) \\
 &= \left(20 - 5 + \frac{20 \times -5}{100} \right) = 14\%
 \end{aligned}$$

which represents profit as the sign is +ve.

30. (c) Here, $x = 5$.

$$\therefore \text{Overall loss \%} = \left(\frac{x}{10} \right)^2 \% = \left(\frac{5}{10} \right)^2 \% = \frac{1}{4} \%$$

31. (c) Here, $x = 20$

$$\therefore \text{Overall loss \%} = \left(\frac{x}{10} \right)^2 \% = \left(\frac{20}{10} \right)^2 \% = 4\%$$

32. (a) Here $x = 25$ and $y = -20$.

$$\begin{aligned}
 \therefore \text{Overall gain/loss \%} &= \left[\frac{100(x+y) + 2xy}{(100+x) + (100+y)} \right] \% \\
 &= \left[\frac{100(25-20) + 2 \times 25 \times -20}{(100+25) + (100-20)} \right] \% \\
 &= -\frac{100}{41} \% \text{ or } -2\frac{18}{41} \%
 \end{aligned}$$

which represents loss being a -ve expression.

33. (c) Here, $x = 20$ and $y = 40$.

$$\begin{aligned}
 \therefore \text{Overall gain \%} &= \left[\frac{100(x+y) + 2xy}{(100+x) + (100+y)} \right] \% \\
 &= \left[\frac{100(20+40) + 2 \times 20 \times 40}{(100+20) + (100+40)} \right] \%
 \end{aligned}$$

$$= \left[\frac{100(20+40) + 2 \times 20 \times 40}{(100+20) + (100+40)} \right] \%$$

$$= \frac{7600}{260} \% = 29\frac{3}{13} \%$$

34. (b) We have, $x = -20$ and $y = -10$.

∴ Overall gain/loss

$$\begin{aligned}
 &= \left[\frac{100(-20-10) + 2 \times -20 \times -10}{(100-20) + (100-10)} \right] \% \\
 &= -\frac{2600}{170} \% \\
 &= -15\frac{5}{17} \%
 \end{aligned}$$

which represents loss being a negative expression.

35. (a) We have, $x = 20$ and $y = 25$.

$$\begin{aligned}
 \therefore \text{Overall gain \%} &= \left[\frac{y+x}{100-y} \times 100 \right] \% \\
 &= \left[\frac{25+20}{100-25} \times 100 \right] \% = 60\%
 \end{aligned}$$

36. (c) Here, $x = -10$ and $y = 20$.

$$\begin{aligned}
 \therefore \text{Overall gain/loss \%} &= \left[\frac{y+x}{100-y} \times 100 \right] \% \\
 &= \left[\frac{20-10}{100-20} \times 100 \right] \% \\
 &= 12\frac{1}{2} \%
 \end{aligned}$$

which represents gain being a positive expression.

37. (c) Here, $x = -10$ and $g = 15$.

Let, the inaccurate scale length = y cm.

$$\text{Using the formula, } \frac{100+g}{100+x} = \frac{\text{Correct measure}}{\text{Incorrect measure}}$$

$$\text{we get, } \frac{100+15}{100-10} = \frac{100}{y} \Rightarrow y = \frac{100 \times 90}{115} = 78.25 \text{ cm.}$$

∴ Actual length of the scale is 78.25 cm instead of 1 m.

38. (a) True measure = 100 cm.

False measure = 80 cm. Also, $x = 0$.

∴ Overall gain % is given by

$$\begin{aligned}
 \frac{100+g}{100+x} &= \frac{\text{True measure}}{\text{False measure}} \\
 \Rightarrow \frac{100+g}{100} &= \frac{100}{80} \Rightarrow 100+g = \frac{100 \times 100}{80} \\
 \Rightarrow g &= \frac{1000}{8} - 100 = 25\%
 \end{aligned}$$

39. (c) Cost price of the CD sold at a loss of 22%

$$= \frac{A(100 + \% \text{ gain})}{(100 - \% \text{ loss}) + (100 + \% \text{ gain})}$$

$$= \frac{380(100+12)}{(100-22)+(100+12)} = \frac{380 \times 112}{78+112}$$

$$= ₹224.$$

Cost price of the CD sold at a gain of 12%

$$= \frac{A(100 - \% \text{loss})}{(100 - \% \text{loss}) + (100 + \% \text{gain})}$$

$$= \frac{380(100-22)}{(100-22)+(100+12)} = \frac{380 \times 78}{78+112}$$

$$= ₹156.$$

40. (a) Marked price of the article = ₹65.

Selling price of the article = ₹56.16.

$$\therefore \text{Discount} = 65 - 56.16 = ₹8.84.$$

$$\therefore \text{Discount \%} = \frac{8.84 \times 100}{65} = 13.6\%$$

The first discount in the offered discount series is 10%
Let, the second discount of the series be $m\%$.

$$\therefore \text{Single discount \%} = \left(m + n - \frac{mn}{100} \right) \%$$

$$\text{or, } 13.6\% = \left(m + 10 - \frac{10m}{100} \right) \%$$

$$\text{or, } 13.6 = m + 10 - \frac{m}{10}$$

$$\text{or, } 136 = 100 + 10m - m \quad \text{or, } 9m = 36$$

$$\text{or, } m = 4\%$$

41. (b) A single discount equivalent to three given successive discounts of 20%, 15% and 5% is given by

$$= \left(20 + 15 + 5 - \frac{(20 \times 15 + 5 \times 15 + 5 \times 20)}{100} + \frac{20 \times 15 \times 5}{100^2} \right) \%$$

$$\text{that is, } (40 - 4.75 + 0.15)\% = 35.4\%$$

$$\text{Marked price of 250 chairs} = 250 \times 50 = ₹12500.$$

$$\therefore \text{Cash payment} = 12500 - 12500 \times \frac{35.4}{100} = ₹8075.$$

42. (a) Using the formula

$$\text{C.P.} = \left[\frac{100^2 z}{(100-d)(100+p)} \right],$$

the cost price of each tape-recorder is given by

$$\text{C.P.} = \left[\frac{100 \times 100 \times 1134}{(100-19)(100+40)} \right]$$

$$= \frac{100 \times 100 \times 1134}{81 \times 140} = ₹1000.$$

EXERCISE-2 (BASED ON MEMORY)

1. (c) Cost price = ₹ $\frac{536+426}{2} = ₹481$

2. (b) Let, the M.P. be ₹ x ,

$$\therefore \text{S.P.} = x - 10\% \text{ of } x = \frac{9x}{10}$$

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

$$\text{C.P.} = ₹900$$

$$\therefore 900 + 25\% \text{ of } 900 = \frac{9x}{10}$$

$$\therefore 9x = 11250 \quad \therefore x = 1250$$

3. (d) 5% of the C.P. = ₹50

$$\therefore \text{C.P. of the table} = \frac{50 \times 100}{5} = ₹1000$$

4. (c) S.P. = ₹45000

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

$$\therefore \text{C.P.} = \frac{45000 \times 100}{100-10} = 50000$$

If profit = 15%, then

$$\text{S.P.} = 50000 + 15\% \text{ of } 50000$$

$$= 50000 + 7500 = ₹57500$$

5. (c) C.P. of a pencil = ₹ $\frac{4}{6} = ₹\frac{2}{3}$

$$\text{S.P. of a pencil} = \frac{6}{4} = ₹\frac{3}{2}$$

$$\therefore \text{Gain} = \frac{3}{2} - \frac{2}{3} = \frac{5}{6}$$

$$\text{Gain \%} = \frac{\frac{5}{6}}{\frac{2}{3}} \times 100 = \frac{5}{6} \times \frac{3}{2} \times 100 = 125$$

6. (c) S.P. = ₹178

$$\text{Loss} = 11\%$$

$$\text{C.P.} = \frac{78 \times 100}{100-11} = \frac{178 \times 100}{89} = ₹200$$

If profit is 11%, then

$$\text{S.P.} = 200 + 11\% = ₹220$$

7. (d) Set I:

$$\text{S.P.} = ₹7400, \text{ Gain} = 10\%$$

$$\text{C.P.} = \frac{7400 \times 100}{110} = ₹\frac{74000}{11}$$

Set II:

$$\text{S.P.} = ₹7400, \text{ Loss } 10\%$$

$$\text{C.P.} = \frac{7400 \times 100}{100-10} = ₹\frac{74000}{9}$$

$$\therefore \text{C.P. of both the sets} = \frac{74000}{11} + \frac{74000}{9}$$

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$$= \frac{20 \times 74000}{99} = \frac{1480000}{99}$$

S.P. of both the sets = ₹14800

$$\therefore \text{Loss} = \frac{1480000}{99} - 14800 = \frac{14800}{99}$$

$$\Rightarrow \text{Loss \%} = \frac{\frac{14800}{99}}{\frac{1480000}{99}} \times 100 = 1$$

8. (c) Profit on each 20 Kg of a and c
 $= 20(38 - 34.5) + 20(36 - 32.4) = 70 + 72$
 $= ₹142$

Profit on 30 Kg of a and 40 Kg of b
 $= 30 \times (37 - 34.5) + 40(33 - 28.6)$
 $= ₹251$

Profit on 20 Kg of b and 40 Kg of c
 $= 20(40 - 28.6) + 40(38 - 32.4) = 228 + 224$
 $= ₹452$

Profit on 25 Kg of c and 30 Kg of a
 $= 25(42 - 32.4) + 30(38 - 34.5) = 240 + 105$
 $= ₹345$

Profit on 40 Kg of b and 20 Kg of a
 $= 40(37 - 28.6) + 20(40 - 34.5) = 336 + 110$
 $= ₹446$

Hence, he will earn maximum in bargain (c).

9. (a) Here, $625 - x = 435 + x$ or, $2x = 625 - 435$

$$\therefore x = \frac{190}{2} = 95$$

Hence, the cost price of the article
 $= 435 + 95 = ₹530$

10. (b) Cost price $= 460 \left(\frac{100}{115} \right) = ₹400$

Required selling price $= 400 \left(\frac{120}{100} \right) = ₹480$

11. (d) Required cost price $= \frac{5765 + 4315}{2}$
 $= \frac{10080}{2} = ₹5040$

12. (b) Let, the cost of 1 metre of cloth be ₹ x

$$\therefore (x+10) \times 145 = 12325$$

$$\therefore 145x + 1450 = 12325$$

$$\therefore x = \frac{12325 - 1450}{145} = ₹75$$

13. (e) Cost price $= ₹ \frac{522 + 378}{2} = ₹450$

14. (c) Let, the S.P. of the article be ₹100

$$\therefore \text{Profit} = ₹26$$

$$\therefore \text{Cost price of the article} = 100 - 26 = ₹74$$

$$\therefore \text{Required percentage} = \frac{34 \times 74}{100} = 25.16\%$$

15. (b) Ratio of investment = 6:3:2

$$\therefore \text{Share of Mr. Shastri} = \frac{3}{11} \times 19800$$

$$= ₹5400$$

16. (c) C.P. $= 20 \times 15 + 30 \times 13 = ₹690$

$$\therefore \text{S.P.} = \frac{4}{3} \text{ of } 690 \times \frac{1}{50} = ₹18.40.$$

17. (a) Let, the cost price of the article be ₹ x

$$\text{Then, } 2(84 - x) = 96 - x$$

$$\text{or, } 168 - 2x = 96 - x$$

$$\therefore x = ₹72.$$

19. (c) Giving no discount to customer implies selling the product on printed price. Suppose the cost price of the article is ₹100

$$\text{Then, printed price} = \frac{100 \times (100 + 23.5)}{(100 - 5)}$$

$$= \frac{100 \times 247}{190}$$

$$= ₹130.$$

20. (e) If no price given, selling price of T.V.

$$= 17940 \times \frac{100}{92}$$

$$= ₹19500$$

$$\text{Cost price of T.V.} = 17940 \times \frac{100}{119.60}$$

$$= ₹15000$$

$$\text{Gain \%} = \frac{19500 - 15000}{15000} \times 100$$

$$= 30\%$$

21. (d) S.P. of both the watches = ₹480

S.P. of each watch = ₹240

Gain = 20%

$$\therefore \text{C.P.} = \frac{240 \times 100}{100 + 20} = 200$$

$$\text{If loss} = 20\%, \text{ then C.P.} = \frac{240 \times 100}{100 - 20} = 300$$

$$\therefore \text{C.P. of both the watches} = ₹500$$

$$\therefore \text{Loss \%} = \frac{20}{500} \times 100 = 4.$$

22. (b) Suppose S.P. of each recorder = ₹ K

If Gain = 10%, then

$$\text{C.P.} = \frac{K \times 100}{100 + 10} = \frac{100K}{110} = \frac{10K}{11}$$

If loss = 10%, then

$$\text{C.P.} = \frac{K \times 100}{100 - 10} = \frac{100K}{90} = \frac{10K}{9}$$

$$\therefore \text{C.P. of both the taperecorders}$$

$$= \frac{10K}{11} + \frac{10K}{9} = \frac{200K}{99}$$

S.P. of both the taperecorders = $2K$

$$\therefore \text{Loss \%} = \frac{2K}{200K} \times 100 = 1.$$

24. (b) Let, S.P. of remaining 10 sheep = K each

$$\therefore 40 \times 150 + 10K - 60 \times 120 = 800$$

$$\Rightarrow K = 200.$$

25. (c) Suppose C.P. = $\text{₹}K$

Marked price = $\text{₹}77$

$$\therefore \text{S.P.} = 77 - 10\% = 69.30$$

$$\therefore 69.30 - K = 10\% \text{ of } K$$

$$\Rightarrow 11K = 693$$

$$\Rightarrow 1K = 63.$$

27. (d) Suppose C.P. of 1000 gm = $\text{₹}1000$

S.P. of 800 gm = $\text{₹}1000$

$$\therefore \text{S.P. of 1000 gm} = \frac{1000}{800} \times 1000 = \text{₹}1250$$

$$\therefore \text{Profit \%} = \frac{250}{1000} \times 100 = 25\%$$

28. (c) S.P. = $\frac{4}{3}$ C.P.

$$\text{Gain} = \frac{1}{3} \text{ C.P.} = \frac{100}{3} \% \text{ of C.P.}$$

$$\therefore \text{Gain \%} = 33\frac{1}{3}$$

29. (a) C.P. = $26 \times 20 + 30 \times 36 = 520 + 1080 = 1600$

$$\text{S.P.} = 56 \times 30 = 1680$$

$$\therefore \text{Profit \%} = 5$$

30. (c) Let, S.P. of 20 tables = $\text{₹}20$

$$\therefore \text{C.P. of 15 tables} = \text{₹}20$$

$$\therefore \text{C.P. of 20 tables} = \frac{20}{15} \times 20 = \frac{80}{3}$$

$$\therefore \text{Loss \%} = \frac{\frac{80}{3} - 20}{\frac{80}{3}} \times 100 = 25.$$

32. (a) S.P. = $\text{₹}700$, Loss = 20%

$$\therefore \text{C.P.} = \frac{\text{S.P.} \times 100}{100 - \text{loss\%}} = \frac{700 \times 100}{80} = 875$$

If gain is 20%, then

$$\text{S.P.} = 875 + 20\% \text{ of } 875$$

$$= 875 + 175 = \text{₹}1050$$

33. (b) C.P. of 7 pencils = $\text{₹}9$

$$\text{C.P. of 1 pencil} = \text{₹}\frac{9}{7}$$

$$\text{S.P. of 8 pencils} = \text{₹}11$$

$$\text{S.P. of 1 pencil} = \text{₹}\frac{11}{8}$$

$$\therefore \text{Gain on 1 pencil} = \frac{11}{8} - \frac{9}{7} = \frac{77 - 72}{56} = \frac{5}{56}$$

If gain is $\text{₹}10$, then number of pencils purchased

$$= \frac{56}{5} \times 10 = 112.$$

34. (c) Let, C.P. of 16 articles = $\text{₹}16$

S.P. of 12 articles = $\text{₹}16$

$$\therefore \text{S.P. of 16 articles} = \frac{16}{12} \times 16 = \text{₹}\frac{256}{3} = \text{₹}\frac{64}{3}$$

$$\therefore \text{Gain on ₹16} = \frac{64}{3} - 16 = \frac{16}{3}$$

$$\text{Gain \%} = \frac{\frac{16}{3}}{16} \times 100 = 33\frac{1}{3}$$

35. (c) Suppose marked price = $\text{₹}K$

$$\therefore K - 12.5\% \text{ of } K = 140 + 20\% \text{ of } 140$$

$$\Rightarrow 87.5\% \text{ of } K = 140 + 28 = 168$$

$$\therefore K = \frac{16800}{87.50} = 192.$$

36. (c) S.P. = $\text{₹}880$, Loss = 20%

$$\therefore \text{C.P.} = \frac{\text{S.P.} \times 100}{100 - \text{Loss\%}} = \frac{880 \times 100}{80} = 1100$$

If gain is to be 10%, then S.P. should be $\text{₹}1210$.

37. (c) 50% of 15000 = 7500

$$30\% \text{ of } 15000 = 4500$$

$$\text{Balance} = 10500$$

$$20\% \text{ of } 10500 = 2100$$

$$\text{Balance} = 8400$$

\therefore Difference between a single discount of 50% and two successive discounts of 30% and 20% is $\text{₹}900$.

38. (c) $\text{₹}2400$ are divided in the ratio of 3:4:5 between X, Y and Z

$$\therefore \text{X's share} = \frac{3}{12} \times 2400 = \text{₹}600$$

Since his share has been diminished by $\text{₹}5$, X got $\text{₹}605$.

39. (c) Annual income of A and B are $4K$ and $3K$, say

$$\therefore 4K - 3L = 600$$

$$3K - 2L = 600$$

$$K = 600, L = 600$$

\therefore Difference in incomes of A and B

$$= 4K - 3K = K = 600.$$

40. (b) Let, C.P. of 4 toys = $\text{₹}x$

$$\therefore \text{S.P. of 3 toys} = \text{₹}x \quad \text{S.P. of 4 toys} = \text{₹}\frac{4x}{3}$$

$$\text{Profit \%} = \frac{\frac{x}{3}}{x} \times 100 = 33\frac{1}{3}.$$

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41. (d) Let, C.P. of the bicycle for A = ₹x

$$\text{C.P. of B} = x + 20\% \text{ of } x = \frac{6x}{5}$$

$$\text{C.P. of C} = \frac{6x}{5} + 25\% \text{ of } \frac{6x}{5} = \frac{6x}{5} + \frac{6x}{5} \times \frac{25}{100} = \frac{3}{2}x$$

$$\therefore \frac{3}{2}x = 225 \Rightarrow x = 150.$$

42. (b) Marked price of 36 pens = ₹36, say

$$\therefore \text{C.P. of 40 pens} = ₹36$$

$$\text{C.P. of 36 pens} = ₹\frac{36}{40} \times 36 = ₹\frac{9}{10} \times 36$$

$$= \frac{324}{10} = \frac{3240}{100}$$

$$\text{S.P. of 36 pens} = ₹36 - 10\% \text{ of } 36$$

$$= 36 - \frac{36}{100} = \frac{3564}{100}$$

$$\therefore \text{Profit}\% = \frac{3564 - 3240}{3240} \times 100 = 10.$$

43. (a) Let, C.P. of a book = ₹x

$$\therefore \text{C.P. of 12 books} = ₹12x$$

$$\text{S.P. of 12 books} = ₹1800$$

$$\text{Profit} = ₹3x$$

$$\therefore 15x = 1800 \Rightarrow x = 120.$$

45. (c) Cost price of chair

$$= 800 \left(1 - \frac{10}{100}\right) \left(1 - \frac{15}{100}\right) = 800 \times \frac{9}{10} \times \frac{17}{20} = ₹612$$

$$\text{Total cost price after transportation} = 612 + 28 = 640$$

$$\therefore \text{Gain \%} = \frac{800 - 640}{640} \times 100 = \frac{160}{640} \times 100 = 25\%$$

46. (d) Loss percentage = $\frac{5-3}{5} \times 100 = \frac{2}{5} \times 100 = 40\%$

47. (c) New S.P. = $480 \times \frac{100}{80} \times \frac{120}{100} = ₹720.$

48. (a) X's gain = $\left(5 - 2 - \frac{5 \times 2}{100}\right)\%$ of 1,50,000
= ₹4350.

49. (c) Suppose number of balloons purchased = 120

$$\therefore \text{C.P. of 120 balloons} = ₹100$$

$$\text{S.P. of 120 balloons} = ₹144$$

$$\therefore \text{Profit} = 44\%$$

50. (d) S.P. of 2 books = ₹2.80

$$\text{Over all percentage change}$$

$$= 20 + (-20) + \frac{20 \times (-20)}{100} = -4 = 4\% \text{ loss}$$

$$\therefore \text{C.P.} = \frac{2.80 \times 100}{100 - 4} = 2.92$$

$$\Rightarrow \text{Loss} = ₹0.12.$$

51. (a) Percentage profit or loss is given by

$$= \frac{11 \times 11 - 10 \times 10}{10 \times 10} \times 100 = 21\%$$

Since the sign is +ve, there is a gain of 21%

52. (d) $(100 - 10)\%$ of $x = 72$

$$\therefore 105\% \text{ of } x = \frac{72}{90} \times 105 = ₹84.$$

53. (a) $\left(10 + 12\frac{1}{2}\right)\%$ of $x = 9$

$$\therefore 100\% \text{ of } x = \frac{9 \times 100}{22.5} = ₹40.$$

54. (a) % profit = $\frac{120 - (80 + 20)}{(80 + 20)} \times 100 = 20\%$

55. (d) % profit = $\frac{8-5}{5} \times 100 = 60\%$

56. (a) S.P. of two articles = ₹2 × 99 = ₹198

Overall % change

$$= 10 + (-10) + \frac{10 \times (-10)}{100} = -1 = 1\% \text{ loss.}$$

57. (b) Gain per cent = $\frac{18-15}{15} \times 100 = 20\%$

58. (b) C.P. = $\frac{5200 \times 100}{100 + 30} = \frac{5200 \times 100}{130} = ₹4000$

60. (d) S.P. = 3990, gain = 5%

$$\therefore \text{C.P.} = \frac{3990 \times 100}{100 + 5} = 3800$$

$$\text{S.P.} = ₹3990, \text{ Loss} = 5\%$$

$$\therefore \text{C.P.} = \frac{3990 \times 100}{100 - 5} = 4200$$

$$\therefore \text{Total C.P.} = ₹8000$$

$$\text{Total S.P.} = ₹7980$$

$$\therefore \text{Loss \%} = \frac{20 \times 100}{8000} = \frac{1}{4} = 0.25.$$

61. (c) C.P. of 50 articles = ₹50, say

$$\therefore \text{S.P. of 40 articles} = ₹50$$

$$\therefore \text{S.P. of 50 articles} = ₹62.50$$

$$\therefore \text{Gain \%} = \frac{12.50}{50} \times 100 = 25.$$

62. (a) C.P. of machine = 1200 + 200 = ₹1400

$$\% \text{ profit} = \frac{1680 - 1400}{1400} \times 100 = 20\%$$

63. (a) S.P. = $840 \times \frac{110}{100} \times \frac{95}{100} = ₹877.80.$

64. (d) C.P. of 1 orange = ₹3.50

$$\text{S.P. of 1 orange} = ₹4$$

$$\% \text{ profit} = \frac{0.50}{3.50} \times 100 = 14\frac{2}{7}\%$$

$$65. (b) \% \text{ profit} = 15 - 12 - \frac{15 \times 12}{100}$$

$$= 3 - 1.80 = 1.20 = 1\frac{1}{5}\%$$

$$66. (a) \text{ Gain \%} = \frac{1}{5} \times 100 = 20\%$$

$$67. (d) \% \text{ profit which Ramesh gets}$$

$$= -10 + 30 - \frac{10 \times 30}{100} = +17\%$$

$$69. (b) \text{ Let, the C.P. be ₹100.}$$

Let, the S.P. be ₹x, then

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

$$\Rightarrow 100(100-x) = 20x$$

$$\Rightarrow 10,000 - 100x = 20x$$

$$\Rightarrow 10,000 = 20x + 100x$$

$$\Rightarrow 10,000 = 120x$$

$$\Rightarrow \frac{10,000}{120} = x$$

$$\Rightarrow ₹ \frac{250}{3} = x$$

Hence, required loss %

$$= 100 - \frac{250}{3} = \frac{50}{3} = 16\frac{2}{3}\%$$

$$70. (d) \text{ S.P. of both the articles is same here. So, profit on one article is equal to the loss on the other. Let the loss \% be } x, \text{ then}$$

$$\Rightarrow 25 - x - \frac{25x}{100} = 0$$

$$\Rightarrow \frac{2500 - 100x - 25x}{100} = 0$$

$$\Rightarrow \frac{2500 - 125x}{100} = 0$$

$$\Rightarrow 2500 - 125x = 0$$

$$\Rightarrow -125x = -2500$$

$$\Rightarrow x = \frac{-2500x}{-125}$$

$$\Rightarrow x = 20$$

$$71. (c) \text{ Let, the number of eggs bought by him be } 15$$

Therefore,

$$\text{C.P. of 15 eggs} = ₹25$$

$$\text{So, S.P. of 15 eggs} = ₹36$$

$$\text{Hence, gain} = 36 - 25 = ₹11$$

$$\text{Thus, 15 eggs} = ₹11$$

$$= \frac{15}{11} \times 143 = ₹143$$

$$= 195 \text{ eggs}$$

$$72. (a) \text{ Let, the marked price of article be ₹100.}$$

Therefore,

$$\text{C.P. of article} = ₹64$$

$$\text{So, S.P. of article} = ₹88$$

$$\text{Thus, profit \%} = \frac{88-64}{64} \times 100 = 37.5\%$$

$$73. (b) \text{ Let, the C.P. of the article be ₹x.}$$

Then,

$$\frac{144-x}{x} \times 100 = x$$

$$\Rightarrow (144-x) \times 100 = x^2$$

$$\Rightarrow x^2 + 100x - 14400 = 0$$

$$\Rightarrow x^2 + 180x + 80x - 14400 = 0$$

$$\Rightarrow x(x+180) - 80(x+180) = 0$$

$$\Rightarrow (x-80)(x+180) = 0$$

$$\text{Therefore, } x = ₹80$$

$$74. (b) \text{ C.P. of the first article} = 5000 \times \frac{100}{125}$$

$$= ₹4000$$

Then, loss on the second article

$$= ₹1000$$

Therefore, C.P. of the second article

$$= ₹6000.$$

Let, the loss per cent be $x\%$, then

$$\frac{6000 \times x}{100} = 1000$$

$$x = \frac{1000 \times 100}{6000}$$

$$= \frac{50}{3} = 16\frac{2}{3}\%$$

$$75. (a) \text{ Let, the man buy (LCM of 8 and 12) oranges}$$

Therefore,

$$\text{C.P. of 24 oranges} = \frac{34}{8} \times 24$$

$$= 34 \times 3 = ₹102$$

$$\text{S.P. of 24 oranges} = \frac{57}{12} \times 21$$

$$= 57 \times 2 = ₹114$$

$$\text{Gain} = ₹114 - ₹102$$

$$\text{Gain} = ₹12$$

$$\text{Thus, ₹12} = 24 \text{ oranges.}$$

$$\text{Hence, ₹45} = \frac{24}{12} \times 45 = 90 \text{ oranges.}$$

$$76. (d) \text{ Let, the advertised price be ₹x}$$

$$\text{Then, S.P.} = ₹ \frac{77x}{100}$$

$$\text{Therefore, C.P.} = ₹ \left(\frac{77x}{100} - 56 \right)$$

$$\therefore \frac{77x - 5600}{100} = \frac{110}{100} = \frac{77x}{100}$$

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$$\Rightarrow \frac{77x - 5600}{100} = \frac{77x}{110} = \frac{7x}{10}$$

$$\Rightarrow 77x - 5600 = 70x$$

$$\Rightarrow 77x - 70x = 5600$$

$$\Rightarrow 7x = 5600$$

$$\Rightarrow x = \frac{5600}{7} = ₹800$$

77. (a) Let, the printed price be ₹100

Selling price = ₹90

$$\text{Cost price} = \frac{100}{112} \times 90$$

$$\text{Required ratio} = \frac{100 \times 90}{112} \times \frac{1}{100}$$

$$= \frac{45}{56} = 45:56$$

78. (d) C.P. of the article = $\frac{170 \times 100}{85} = ₹200$.

$$\therefore \text{Required S.P.} = \frac{200 \times 120}{100} = ₹240.$$

79. (d) Cost price of the item = ₹9600

$$\text{Selling price of the item,} = 9600 \times \frac{95}{100} \times \frac{105}{100} = ₹9576$$

$$\text{Hence, required loss} = 9600 - 9576 = ₹24$$

80. (d) C.P. of 80 ball pens = $140 \times \frac{100}{70} = ₹200$

$$\text{For a gain of 30\%, S.P.} = \frac{200 \times 130}{100} = ₹260$$

$$\therefore ₹260 = 80 \text{ ball pens}$$

$$\therefore ₹104 = \frac{80}{260} \times 104 = 32 \text{ ball pens.}$$

81. (d) Cost price = 5600

$$\text{Selling price} = 5600 \times \frac{3}{4} = 4200$$

$$\text{Loss} = 5600 - 4200 = 1400$$

$$\% \text{ loss} = \frac{1400}{5600} \times 100 = 25\%$$

82. (c) The cost price of an article

$$= \frac{996 + 894}{2} = \frac{1890}{2} = ₹945$$

83. (b) Total cost price = 11250 + 150 + 800

$$= ₹12200$$

$$\text{Selling price} = 12200 \times \frac{115}{100}$$

$$= ₹14030$$

84. (d) The shopkeeper sells 10 notebooks in a day, then in two weeks (i.e., 14 days) he sells = $14 \times 10 = 140$ notebooks

$$\text{Commission earned} = 45 \times \frac{4}{10} \times 140 = ₹252$$

Sells 6 pencil boxes in a day, then in two weeks he sells (i.e., 14 days) = $14 \times 6 = 84$ pencil boxes

$$\text{Commission earned} = 80 \times \frac{20}{100} \times 84 = ₹1344$$

$$\text{Total commission earned} = 252 + 1344 = ₹1596$$

85. (d) Cost price of 30 Kg wheat = $30 \times 45 = ₹1350$

Cost price of 30 Kg wheat + 25% profit = Selling Price

$$= 1350 \times 1.25 = ₹1687.50$$

$$40\% \text{ of } 30 \text{ Kg wheat} = 30 \times 0.40 = 12 \text{ Kg}$$

Selling price of 12 Kg wheat

$$= 12 \times 50 = ₹600$$

Remaining 18 Kg wheat's selling price

$$= 1687.50 - 600$$

$$= ₹1087.50$$

$$\therefore \text{Selling price of 1 Kg wheat} = \frac{1087.50}{18} = 60.4 \text{ kg.}$$

86. (c) Let, the marked price and the cost price be ₹x and ₹y, respectively.

Now, according to the question,

$$50\% \text{ of } x = 90\% \text{ of } y$$

$$\Rightarrow \frac{x \times 50}{100} = \frac{y \times 90}{100}$$

$$\Rightarrow y = \frac{x \times 50}{90} = ₹\frac{5}{9}x$$

$$= \frac{5}{9} \text{ of the marked price.}$$

87. (b) Marked price = ₹(7710 + 1285) = ₹8995

Let, the discount be x%

Now, according to the question,

$$x\% \text{ of } 8995 = 1285$$

$$\Rightarrow \frac{8995 \times x}{8995} = 1285$$

$$\Rightarrow x = \frac{1285 \times 100}{8995} = \frac{100}{7} = 14\frac{2}{7}\%$$

88. (a) Let, the C.P. of cycle be ₹x.

Now, according to the question,

$$840 \times \frac{90}{100} = \frac{x \times 126}{100}$$

$$\Rightarrow x \times 126 = 840 \times 90$$

$$\Rightarrow x = \frac{840 \times 90}{126} = ₹600$$

89. (d) Let, the marked price of article be ₹x.

Now, according to the question,

$$\therefore \text{C.P. of article} = ₹\frac{2x}{5}$$

$$\text{S.P. of article} = \frac{x \times 90}{100} = ₹\frac{9x}{10}$$

$$\text{Gain} = \frac{9x}{10} - \frac{2x}{5} = \frac{9x - 4x}{10} = \frac{5x}{10} = \frac{x}{2}$$

$$\therefore \text{Gain per cent} = \frac{\text{Gain} \times 100}{\text{C.P.}}$$

$$= \frac{\frac{x}{2} \times 100}{\frac{2x}{5}} = \frac{5 \times 100}{4} = 125\%$$

90. (b) First S.P. of article = $\frac{200 \times 90}{100} = ₹180$

After decrease of 5%

$$\text{S.P.} = \frac{180 \times 95}{100} = ₹171$$

91. (c) 20 items are broken out of 144 items.

\therefore C.P. of 124 items.

$$= ₹\left(\frac{144 \times 90}{100}\right) = ₹129.60$$

$$\text{Total S.P.} = ₹(1.20 \times 124) = ₹148.8$$

$$\therefore \text{Gain} = ₹(148.80 - 129.60) = ₹19.20$$

$$\therefore \text{Gain per cent} = \frac{19.20}{129.60} \times 100 = 14.8\%$$

92. (a) Let, the C.P. of article be ₹x.

$$\text{Then, S.P.} = ₹\frac{120x}{100} = ₹\frac{6x}{5}$$

$$\text{Gain} = \frac{6x}{5} - x = \frac{6x - 5x}{5} = ₹\frac{x}{5}$$

$$\therefore \text{Gain per cent} = \frac{\text{Gain}}{\text{S.P.}} \times 100$$

$$= \frac{\frac{x}{5}}{\frac{6x}{5}} \times 100 = \frac{50}{3} = 16\frac{2}{3}\%$$

93. (a) C.P. of article

$$= \frac{100}{100 - \text{loss per cent}} \times \text{S.P.}$$

$$= \frac{100}{100 - 15} \times 102 = ₹120$$

On selling at ₹134.40, we have,

$$\text{Gain} = ₹(134.4 - 120) = ₹14.4$$

\therefore Gain per cent

$$= \frac{14.4}{120} \times 100 = 12\%$$

94. (a) Let, the C.P. of first toy be ₹x.

\therefore C.P. of second toy = ₹y

Now, according to the question,

$$\frac{x \times 112}{100} = 504$$

$$\Rightarrow x = \frac{504 \times 100}{112} = ₹450$$

$$\text{Again, } y \times \frac{96}{100} = 504$$

$$\Rightarrow y = \frac{504 \times 100}{96} = ₹525$$

$$\text{Total C.P.} = ₹(450 + 525) = ₹975$$

$$\text{Total S.P.} = ₹(2 \times 504) = ₹1008$$

$$\text{Gain} = ₹(1008 - 975) = ₹33$$

$$\therefore \text{Profit per cent} = \frac{33 \times 100}{975} = \frac{44}{13} = 3\frac{5}{13}\%$$

95. (d) For A,

$$\text{C.P. of horse} = ₹\left(4800 \times \frac{100}{80}\right) = ₹6000$$

For B,

$$\text{S.P.} = ₹\left(\frac{6000 \times 115}{100}\right) = ₹6900$$

$$\text{B's profit} = ₹(6900 - 4800) = ₹2100$$

96. (d) Let, the original price of the article be ₹x per Kg.

$$\therefore \text{New price} = ₹\frac{79x}{100} \text{ per Kg}$$

Now, according to the question,

$$\frac{100}{79x} - \frac{100}{x} = 3$$

$$\Rightarrow \frac{10000}{79x} - \frac{100}{x} = 3$$

$$\Rightarrow \frac{10000 - 7900}{79x} = 3$$

$$\Rightarrow \frac{2100}{79x} = 3$$

$$\Rightarrow \frac{700}{79x} = 1$$

$$\Rightarrow 79x = 700 \Rightarrow x = \frac{700}{79}$$

$$\therefore \text{New price} = \frac{79x}{100} = \frac{79}{100} \times \frac{700}{79} = ₹7 \text{ per Kg}$$

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97. (c) Let, the C.P. of the article be ₹100.

∴ Marked price = ₹130

$$\Rightarrow \text{Selling price} = \frac{130 \times \left(100 - \frac{25}{4}\right)}{100} = \frac{130 \times 375}{400}$$

$$= ₹ \frac{975}{8} = ₹ \left(121 \frac{7}{8}\right)$$

$$\therefore \text{Gain \%} = \left(121 \frac{7}{8} - 100\right) = 21 \frac{7}{8} \%$$

$$\begin{aligned} 98. \text{ (a) C.P. of the chair} &= \left(600 - \frac{600 \times 15}{100}\right) \times \frac{80}{100} \\ &= \frac{510 \times 80}{100} = ₹408 \end{aligned}$$

$$\text{Actual C.P.} = ₹(408 + 28) = ₹436$$

$$\text{Gain per cent} = \frac{545 - 436}{436} \times 100 = 25\%$$

99. (a) Single equivalent discount for 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100}\right) = 28\%$$

Single equivalent discount for 28% and 10%

$$= \left(28 + 10 - \frac{28 \times 10}{100}\right) = 35.2\%$$

$$\therefore \text{S.P. of the piano} = \frac{15000 \times (100 - 35.2)}{100} = ₹9720$$

100. (a) S.P. of 25 m of cloth – C.P. of 25 m of cloth = S.P. of 5 m of cloth

∴ C.P. of 25 m of cloth = S.P. of 20 m of cloth

∴ C.P. = ₹20, S.P. = ₹25 (let)

$$\therefore \text{Gain per cent} = \frac{5}{20} \times 100 = 25\%$$

101. (c) Let, the C.P. of the suitcase for A be ₹x.

Now, according to the question,

$$x \times \frac{110}{100} \times \frac{130}{100} = 2860$$

$$\Rightarrow x \frac{2860 \times 100 \times 100}{100 \times 130} = ₹2000$$

102. (b) Total expected S.P. = $\frac{96000 \times 110}{100} = ₹105600$

$$\text{S.P. of the first part} = \frac{2}{5} \times 96000 \times \frac{94}{100} = ₹36096$$

$$\text{S.P. of the remaining part} = 105600 - 36096 = ₹69504$$

$$\text{C.P. of the remaining part} = \frac{3}{5} \times 96000 = ₹57600$$

$$\text{Gain} = ₹(69504 - 57600) = ₹11904$$

Let, the gain per cent be x.

Now, according to the question,

$$\frac{57600 \times x}{100} = 11904$$

$$\Rightarrow x = \frac{11904 \times 100}{57600} = 20 \frac{2}{3} \%$$

103. (c) Let, the C.P. of the article be ₹x.

Now, according to the question,

$$\frac{120x}{100} - \frac{115x}{100} = 27 \Rightarrow \frac{5x}{100} = 27$$

$$\Rightarrow x = \frac{27 \times 100}{5} = ₹540$$

104. (d) Let, the C.P. of a ball be ₹x.

∴ S.P. of 17 balls = ₹720

Now, according to the question,

$$17x - 720 = 5x$$

$$\Rightarrow 12x = 720 \Leftrightarrow x = ₹60$$

105. (c) Let, the C.P. of items A and B be ₹x and ₹y, respectively.

Now, according to the question,

$$10\% \text{ of } x = 15\% \text{ of } y$$

$$\Rightarrow \frac{x}{y} = \frac{15}{10} = \frac{3}{2} \Leftrightarrow x:y = 3:2$$

Clearly, the required C.P. of A and B will be ₹3000 and ₹2000, respectively.

Quicker Method:

$$10\% \text{ of } 3000 = \frac{3000 \times 10}{100} = ₹300$$

$$15\% \text{ of } 2000 = \frac{2000 \times 15}{100} = ₹300$$

106. (b) Quicker Method:

$$\begin{aligned} \text{Net gain per cent} &= \left(20 - 15 - \frac{20 \times 15}{100}\right) \\ &= 20 - 18 = 2\% \end{aligned}$$

107. (a) Quicker Method:

Single equivalent discount

$$= \left(20 + 10 - \frac{20 \times 10}{100}\right) = 28\%$$

$$\Rightarrow \text{C.P. of table} = \frac{1500 \times 72}{100} = ₹1080$$

$$\text{Actual C.P.} = ₹(1080 + 20) = ₹1100$$

$$\therefore \text{Required S.P.} = ₹ \left(1100 \times \frac{120}{100}\right) = ₹1320$$

108. (c) Let, the C.P. for A be ₹x.

Now, according to the question,

$$x \times \frac{120}{100} \times \frac{110}{100} \times \frac{225}{200} = 29.70$$

$$\Rightarrow x = \frac{29.70 \times 100 \times 100 \times 200}{120 \times 110 \times 225} = 20$$

109. (a) C.P. for 80 ball pens = $140 \times \frac{100}{70} = ₹200$

For a gain of 30%

$$\text{S.P.} = \frac{200 \times 130}{100} = ₹260$$

$$\therefore ₹260 = 80 \text{ ball pens}$$

$$\therefore ₹104 = \frac{80}{260} \times 104 = 32$$

110. (a) Let, the marked price of the trouser be ₹x.

According to the question,

$$\frac{x \times 40}{100} = 320$$

$$\Rightarrow x = \frac{320 \times 100}{40} = ₹800$$

$$\therefore \text{S.P. of trouser} = \frac{800 \times 60}{100} = ₹480$$

111. (b) Market price of the gift item = $\frac{510 \times 100}{85}$
= ₹600

$$\text{S.P. for Rahim} = \frac{600 \times 105}{100} = ₹630$$

$$\text{Earned profit} = ₹(630 - 510) = ₹120$$

112. (c) Total C.P. = ₹100 (100 articles)

$$\text{Total S.P.} = 75 \times \frac{140}{100} + 25 \times \frac{60}{100} \times 1.4$$

$$= 105 + 21 = ₹126$$

$$\therefore \text{Gain per cent} = 26$$

113. (b) Total C.P. = $\frac{240 \times 48}{12} = ₹960$

$$\text{S.P. for a gain of 25\%} = \frac{960 \times 125}{100} = ₹1200$$

$$\text{Amount received on half of bananas at ₹5 per banana} = 120 \times 5 = ₹600$$

$$\text{Remaining bananas} = 120 \times \frac{5}{6} = 100$$

$$\text{S.P. of these 100 bananas} = ₹600$$

$$\therefore \text{Rate} = ₹6 \text{ per banana}$$

114. (d) Ratio of profit = 350000 : 140000 = 5 : 2

If the total profit be ₹x, then

$$\text{A's share} = \frac{5}{7} \times \frac{4x}{5} + \frac{x}{5} = \frac{4x}{7} + \frac{x}{5}$$

$$= \frac{20x + 7x}{35} = ₹\frac{27x}{35}$$

$$\text{B's share} = \frac{2}{7} \times \frac{4x}{5} = ₹\frac{8x}{35}$$

$$\therefore \text{Difference} = \frac{27x}{35} - \frac{8x}{35} = \frac{19x}{35}$$

Now, according to the question,

$$\therefore \frac{19x}{35} = 38000$$

$$\therefore x = \frac{38000 \times 35}{19} = ₹70000$$

115. (a) Let, the original marked price be ₹x.

$$\begin{aligned} \text{Equivalent discount \%} &= \left(10 + 6 - \frac{10 \times 6}{100} \right) \% \\ &= (16 - 0.6)\% = 15.4\% \end{aligned}$$

$$\text{Selling price} = x \left(\frac{100 - 15.4}{100} \right) = \frac{84.6x}{100} = \frac{846}{1000}$$

Now, according to the question,

$$\frac{846x}{1000} = 846$$

$$\therefore x = \frac{846 \times 1000}{846} = ₹1000$$

116. (c) Let, C.P. of article = ₹100 and marked price = ₹x

Single equivalent discount

$$= \left(20 + \frac{25}{4} - \frac{20 \times 25}{400} \right) \% = 25\%$$

Now, according to the question,

$$x \times \frac{75}{100} = 120$$

$$\Rightarrow x = \frac{120 \times 100}{75} = ₹160$$

$$\therefore \text{The required percentage} = (160 - 100) = 60\%$$

117. (a) Single equivalent discount for 10% and 20%

$$= 20 + 10 - \frac{20 \times 10}{100} = 28\%$$

Single equivalent discount for 28% and 40%

$$= 40 + 28 - \frac{40 \times 28}{100} = 68 - 11.2 = 56.8\%$$

118. (c) Let, the marked price of TV be ₹x.

Now, according to the question,

$$\frac{4x}{5} - \frac{3x}{4} = 500$$

$$\Rightarrow \frac{16x - 15x}{20} = 500 \Rightarrow \frac{x}{20} = 500$$

$$\Rightarrow x = 10000$$

$$\therefore \text{Required cost price} = ₹ \left(\frac{10000 \times 80}{100} \right) = ₹8000$$

119. (c) Let, the required cost price be ₹x, then by

Rule of fraction, we have

$$x \times \frac{110}{10} \times \frac{120}{100} \times \frac{85}{100} = 56100$$

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$$\Rightarrow x \times \frac{11}{10} \times \frac{6}{5} \times \frac{17}{20} = 56100$$

$$\Rightarrow x = \frac{56100 \times 10 \times 5 \times 20}{11 \times 6 \times 17} = ₹50000$$

- 120. (a)** Let, the C.P. of article be ₹x

Now, according to the question,

$$\frac{117x}{100} - \frac{81x}{100} = 162$$

$$\Rightarrow \frac{36x}{100} = 162$$

$$\Rightarrow x = \frac{162 \times 100}{36} = ₹450$$

- 121. (d)** Required S.P. of 150 pens

$$= 150 \times 12 \times \frac{115}{100} = ₹2070$$

$$\text{S.P. of first 50 pens} = \frac{50 \times 12 \times 110}{100} = ₹660$$

C.P. of 100 pens = ₹1200

Let, the required gain % be x.

Now, according to the question,

$$\frac{1200 \times (100 + x)}{100} + 660 = 2070$$

$$\Rightarrow 1200 + 12x = 2070 - 660 = 1410$$

$$\therefore x = \frac{1410 - 1200}{12} = \frac{210}{12} = \frac{35}{2} = 17\frac{1}{2}\%$$

- 122. (d) Quicker Method:**

Here, S.P. is same. Hence there is always a loss.

$$\text{Loss per cent} = \frac{20 \times 20}{100} = 4\%$$

- 123. (b) Quicker Method:**

$$\text{Gain per cent} = \frac{40 - 25}{25} \times 100 = \frac{15}{25} \times 100 = 60\%$$

- 124. (b)** Let, the C.P. of A be ₹x.

Now, according to the question,

$$x \times \left(1 + \frac{1}{5}\right) \times \frac{120}{100} \times \left(1 - \frac{1}{6}\right) = ₹600$$

$$\Rightarrow x \times \frac{6}{5} \times \frac{6}{5} \times \frac{5}{6} = 600$$

$$\Rightarrow x = \frac{600 \times 5}{6} = ₹500$$

- 125. (d)** Let, the total amount be ₹x

Now, according to the question,

$$\therefore x - \frac{x}{5} - \frac{4x}{5} \times \frac{5}{100} - 120 = 1400$$

$$\Rightarrow x - \frac{x}{5} - \frac{x}{25} = 1520$$

$$\Rightarrow \frac{25x - 5x - x}{25} = 1520$$

$$\Rightarrow \frac{19x}{25} = 1520$$

$$\Rightarrow x = \frac{1520 \times 25}{19} = ₹2000$$

\therefore Expenditure on transport

$$= \frac{4x}{5} \times \frac{5}{100} = \frac{x}{25} = \frac{1}{25} \times 2000$$

$$= ₹80$$

- 126. (a)** Let, the cost price be ₹100 and the marked price be ₹x.

Now, according to the question,

$$x \times \frac{3}{4} = 125$$

$$\Rightarrow x = \frac{125 \times 4}{3} = ₹\frac{500}{3}$$

$$\therefore \text{required ratio} = \frac{500}{3} : 100 = 5:3$$

- 127. (b) Quicker Method:**

Single equivalent discount for two successive discounts of x% and y%

$$= \left(x + y - \frac{xy}{100}\right)\%$$

\therefore Single equivalent discount for 10% and 20%

$$= \left(10 + 20 - \frac{10 \times 20}{100}\right)\% = 28\%$$

Single equivalent discount for 28% and 50%

$$= \left(50 + 28 - \frac{50 \times 28}{100}\right)\% = (78 - 14)\% = 64\%$$

- 128. (d) I. Single equivalent discount**

$$= \left(10 + 10 - \frac{10 \times 10}{100}\right)\% = 19\%$$

II. Single equivalent discount

$$= \left(12 + 8 - \frac{12 \times 8}{100}\right)\%$$

$$= 19.04\%$$

III. Single equivalent discount

$$= \left(15 + 5 - \frac{15 \times 5}{100}\right)\% = 19.5\%$$

$$\mathbf{129. (b)} \quad A = P \left(1 - \frac{R}{100}\right)^T$$

$$\Rightarrow 729 = P \left(1 - \frac{10}{100}\right)^3$$

$$\Rightarrow 729 = P \times \left(\frac{9}{10}\right)^3 = \frac{729}{1000} P$$

$$\Rightarrow P = \frac{729 \times 1000}{729} = ₹1000$$

130. (a) Let, the number of oranges bought be ₹x.

$$\therefore \text{C.P. of } x \text{ oranges} = \frac{x \times 40}{2 \times 12} + \frac{x \times 40}{2 \times 12} = ₹ \frac{70x}{24}$$

$$\therefore \text{S.P. of } x \text{ oranges} = \frac{x \times 45}{12}$$

Now, according to the question,

$$\frac{45x}{12} - \frac{70x}{24} = 480$$

$$\Rightarrow \frac{90x - 70x}{24} = 480$$

$$x = \frac{480 \times 24}{20} = 576 = 48 \times 12 = 48 \text{ dozen}$$

131. (d) Let, the C.P. of chair sold at loss be ₹x

$$\therefore \text{C.P. second chair} = ₹(900 - x)$$

Now, according to the question,

$$\frac{900 - x}{4} - \frac{x}{5} = 90$$

$$\Rightarrow \frac{4500 - 5x - 4x}{20} = 90$$

$$\Rightarrow 4500 - 9x = 1800$$

$$\Rightarrow x = \frac{2700}{9} = ₹300$$

132. (b) Let, S.P. of 100 oranges be ₹x.

$$\therefore \text{S.P. of 20 oranges} = \frac{x \times 20}{100} = ₹ \frac{x}{5} = \text{Gain}$$

$$\therefore \text{CP} = x - \frac{x}{5} = ₹ \frac{4x}{5}$$

$$\therefore \text{Gain per cent} = \frac{\frac{x}{5}}{\frac{4x}{5}} \times 100 = \frac{100}{4} = 25\%$$

133. (c) Let, the C.P. of article be ₹100 and its S.P. be ₹x.

Now, according to the question,

$$100 \times \frac{60}{100} = \frac{x \times 50}{100}$$

$$\Rightarrow 60 = \frac{x}{2} \Rightarrow x = 120$$

$$\therefore \text{Gain\%} = 20\%$$

134. (d) C.P. of two horses = ₹(2 × 40000) = 80000 and S.P. of two horses = ₹(80000 - 3600) = 76400

$$\text{S.P. of one horse} = ₹ \left(4000 \times \frac{115}{100} \right) = 46000$$

$$\text{S.P. of the other horse} = ₹(76400 - 46000) = 30400$$

135. (d) Let, the seller buy xy guavas.

$$\therefore \text{C.P. of } xy \text{ guavas} = xy \times \frac{y}{x} = y^2$$

$$\text{S.P. of } xy \text{ guavas} = xy \times \frac{x}{y} = x^2$$

$$\therefore \text{Gain} = x^2 - y^2 (\because x > y)$$

$$\text{Gain\%} = \frac{x^2 - y^2}{y^2} \times 100$$

136. (c) Let, C.P. be ₹x, then

$$\text{S.P.} = x + \frac{15x}{100} = ₹ \frac{155x}{100}$$

If he had bought the horse for 25% less, then

$$\text{C.P.} = x - \frac{25x}{100} = ₹ \frac{75x}{100}$$

Now, according to the question,

$$\frac{155x}{100} - 60 = \frac{75x}{100} \times \left(1 + \frac{32}{100} \right) = \left[\frac{75}{100} \times \frac{132}{100} \right] x$$

$$\Rightarrow \frac{115x}{100} - 60 = \frac{99x}{100} \Rightarrow \frac{155x}{100} - \frac{99x}{100} = 60$$

$$\Rightarrow \frac{16x}{100} = 60 \therefore x = \frac{6000}{16} = ₹375$$

137. (a) Let, A buy the article in ₹100.

According to the question,

$$\text{B's cost} = ₹125$$

$$\text{C's cost} = ₹125 \left(\frac{100 + 20}{100} \right) = ₹150$$

$$\text{D's cost} = ₹150 \left(\frac{100 + 10}{100} \right) = ₹165$$

Here, at the end the article was sold out at ₹165.

$$\therefore \text{Required cost for A} = \frac{330}{165} \times 100 = ₹200.$$

138. (a) Let, the cost of article be ₹x. At x% loss, the article sold at ₹21

Now, according to the question,

$$x \left(\frac{100 - x}{100} \right) = 21 \Rightarrow x \left(1 - \frac{x}{100} \right) = 21$$

$$\Rightarrow x - \frac{x^2}{100} = 21 \Rightarrow x^2 - 100x + 2100 = 0$$

$$\Rightarrow (x - 30)(x - 70) = 0$$

$$\therefore x = ₹30 \text{ or, } ₹70$$

139. (c) Here, 50 articles were sold at a profit of 20% and 50 articles at a profit of 40%

Let, the price of each article be ₹x, then Total S.P.

$$= \left\{ \frac{50x \times 20}{100} + 50x \right\} + \left\{ \frac{50x \times 40}{100} + 50x \right\}$$

$$= ₹130x$$

Selling Price of all the articles at 25% profit

$$= 100x + \frac{100x - 25}{100} = 125x$$

$$\text{Difference} = 130x - 125x = 5x$$

$$\Rightarrow 5x = ₹100 \Rightarrow x = ₹20$$

$$\therefore \text{The cost price of each article was ₹20}$$

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- 140. (c)** Let, the second successive discount be $x\%$

Now, according to the question,

$$3200 \left(1 - \frac{10}{100}\right) \left(1 - \frac{x}{100}\right) = 2448$$

$$\Rightarrow 3200 \times \frac{90}{100} \times \left(1 - \frac{x}{100}\right) = 2448$$

$$\Rightarrow 1 - \frac{x}{100} = \frac{2448}{2880}$$

$$\Rightarrow \frac{x}{100} = 1 - \frac{2448}{2880} = \frac{432}{2880} = \frac{3}{20}$$

$$\therefore x = \frac{300}{20} = 15\%$$

\therefore The rate of second discount is 15%

- 141. (a)** Let, C.P. be ₹100

$$\text{Marked price} = 100 \times \frac{30}{100} + 100 = ₹130$$

$$\text{Price after 15\% discount} = 130 - \frac{130 \times 15}{100}$$

$$= 130 - 19.5 = ₹110.5$$

$$\therefore \text{profit} = ₹10.5$$

$$\therefore ₹10.5 \text{ profit, then C.P.} = ₹100$$

$$\therefore ₹84 \text{ profit, then C.P.} = \frac{84}{10.5} \times 100 = ₹800$$

- 142. (b)** Let, the marked price be ₹ x .

Selling price of the article at 5% commission

$$= x \left(\frac{100 - 5}{100} \right) = ₹ \frac{95x}{100}$$

Cost price of the article at 10% profit

$$= \frac{95x}{100} \left(\frac{100}{100 + 10} \right) = ₹ \frac{95x}{110}$$

Now, according to the question,

$$\frac{95x}{110} = 95$$

$$\Rightarrow x = \frac{95 \times 110}{95} = ₹110$$

- 143. (a)** Let, the cost price of 1 Kg (1000g) of sugar be ₹ x

$$\therefore \text{Cost price of 950g of sugar} = ₹ \frac{950x}{1000}$$

Now, according to the question,

Selling price of 950g of sugar = ₹ x

$$\therefore \text{Profit \%} = \left(\frac{x - \frac{950x}{1000}}{\frac{950x}{1000}} \right) \times 100$$

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

$$= \frac{1000 - 950}{950} \times 100 = \frac{5 \times 100}{95} = \frac{100}{19} = 5\frac{1}{5}\%$$

Quicker Method:

$$\text{Profit per cent} = \frac{1000 - 950}{950} \times 100\%$$

$$= \frac{50}{950} \times 100\% = \frac{100}{19}\% = 5\frac{1}{19}\%$$

- 144. (c)** Let, the price of horse be ₹ x

$$\therefore \text{Price of carriage} = ₹(20000 - x)$$

Now, according to the question,

$$\frac{x \times 120}{100} + \frac{(20000 - x) \times 90}{100} = 20000 \left(1 + \frac{2}{100} \right)$$

$$\Rightarrow \frac{120x}{100} + \frac{20000 \times 90 - 90x}{100} = 20400$$

$$\Rightarrow 1.2x + 18000 - 0.9x = 20400$$

$$\Rightarrow 0.3x = 2400 \Rightarrow x = 8000$$

$$\Rightarrow \text{Cost price of horse} = ₹8000$$

- 145. (a)** Let, the price of article be ₹100

A sold to B at = ₹115

$$\text{C purchased from B for} = ₹ \left[115 - \frac{115 \times 10}{100} \right]$$

$$= ₹103.50$$

$$\text{Required C.P. for A} = ₹ \frac{517.50}{103.50} \times 100 = ₹500$$

- 146. (c)** Let, the selling price of article be ₹ x [Here, 10% loss on selling article at $\frac{2x}{3}$ price.]

Let, C.P. = y

Then, after 10% loss the selling price = $\frac{90y}{100}$

$$\therefore \frac{90y}{100} = \frac{2}{3}x$$

$$\Rightarrow y = \frac{20}{27}x$$

$$\therefore \text{C.P.} = \frac{20}{27}x$$

\therefore The gain per cent on selling it at the original price

$$\frac{x - \frac{20}{27}x}{\frac{20}{27}x} \times 100\%$$

$$= \frac{\frac{7x}{27}}{\frac{20x}{27}} \times 100\% = 35\%$$

- 147. (c)** Let, the cost price be ₹ x

$$\text{Price after 10\% loss} = ₹ \frac{90x}{100}$$

Now, according to the question,

$$\frac{90x}{100} = 45000$$

$$\therefore x = ₹50000$$

C.P. given by C = Given a profit of 10% to

$$A = \frac{110}{100} \times 50000 = ₹55000$$

\therefore B bought it in ₹45000 and sold it in ₹55000.

$$\begin{aligned}\therefore \text{Required profit} &= \frac{55000 - 45000}{45000} \times 100\% \\ &= \frac{200}{9}\%\end{aligned}$$

148. (c) Let, the marked price be ₹100

\therefore Cost price = ₹80 S.P. after giving 12% discount at ₹100 = ₹88

$$\therefore \text{Profit} = \frac{88 - 80}{80} \times 100\% = \frac{8}{80} \times 100\% = 10\%$$

149. (b) Let, the list price of wrist watch be ₹x.

Selling price of wrist watch at 10% discount

$$= ₹x \left(\frac{100 - 10}{100} \right) = ₹\frac{9x}{10}$$

Cost price of wrist watch at 20% profit

$$= ₹\frac{9x}{10} \left(\frac{100}{100 + 20} \right) = ₹\left(\frac{9x}{10} \times \frac{10}{12} \right) = ₹\frac{3x}{4}$$

Now, according to the question,

$$\frac{3x}{4} = 450 \Rightarrow x = \frac{450 \times 4}{3} = 600$$

\therefore List price of the wrist watch = ₹600

150. (c) Amount received by C

$$= \text{Total profit} \times \left(1 - \frac{1}{3} - \frac{1}{4} \right)$$

$$= \text{Total profit} \times \frac{5}{12}$$

Now, according to the question,

$$\Rightarrow 5000 = \frac{5}{12} \times \text{Total profit}$$

$$\Rightarrow \text{Total profit} = ₹12000$$

\therefore The amount received by A

$$= \frac{12000}{3} = ₹4000$$

151. (a) Let, the number of cakes be 100.

Let, each cake's cost price be ₹100.

Then, total cost price = ₹(100 × 100) = ₹10000

$$\text{Now, market price of each cake} = \frac{100 \times 140}{100} = ₹140$$

$$\text{Now, selling price of 24 cakes} = 24 \times \frac{100 \times 80}{100} = ₹1920$$

And selling price of 60 cakes = 60 × 140 = ₹8400

$$\therefore \text{Total selling price} = 8400 + 1920 = ₹10320$$

$$\text{Profit} = 10320 - 10000 = 320$$

$$\therefore \text{Required \% profit} = \frac{320}{10000} \times 100 = 3.2\%$$

$$\begin{aligned}\text{152. (a) Loss percentage} &= \left(\frac{\text{Common gain or loss}}{10} \right)^2 \\ &= \frac{144}{100} = \frac{36}{25} = 1\frac{11}{25}\%\end{aligned}$$

Quicker Method:

$$12 - 12 - \frac{12 \times 12}{100} = -\frac{144}{100} = -\frac{36}{25} = -1\frac{11}{25}\%$$

Negative sign shows loss.

153. (a) Cost price = ₹78350

$$\text{Marked price} = 78350 \times \frac{130}{100} = ₹101855$$

$$\text{Selling price} = 101855 \times \frac{80}{100} = ₹81484$$

$$\text{Profit} = 81484 - 78350 = 3134$$

$$\therefore \text{Required \% profit} = \frac{3134}{78350} \times 100 = 4\%$$

154. (d) Amount received by all the officers

$$= 45 \times 25000 = 11,25,000$$

$$\text{Amount received by each clerk} = \frac{3}{5} \times 25000 = 15000$$

Amount received by all the clerks

$$= 80 \times 15000 = 12,00,000$$

$$\begin{aligned}\text{Total amount of profit earned} &= 11,25,000 + 12,00,000 \\ &= 23.25 \text{ Lakhs.}\end{aligned}$$

155. (e) Let, the cost price of the articles be ₹100.

To earn a profit of 30% he labelled them ₹130.

After giving a discount of 10% the selling price of the articles = $0.9 \times 130 = 117$

$$\text{So, actual profit per cent} = \frac{(117 - 100)}{100} \times 100 = 17\%$$

$$\text{156. (a) First S.P.} = \frac{46000 \times 88}{100} = ₹40480$$

$$\text{Second S.P.} = \frac{40480 \times 112}{100} = ₹45337.6$$

$$\therefore \text{Loss} = ₹(46000 - 45337.6) = ₹662.4$$

$$\text{157. (d) First selling price} = \frac{54000 \times 92}{100} = ₹49680$$

$$\text{Second selling price} = 49680 \times \frac{110}{100} = ₹54648$$

$$\therefore \text{Profit} = 54648 - 54000 = ₹648$$

9.40 Chapter 9

- 158. (e)** Total number of notebooks sold in two weeks
 $= 2 \times 7 \times 10 = 140.$

Total commission earned on selling of notebooks

$$= 140 \times 457 \times \frac{4}{100} = ₹2559.2$$

Similarly, commission earned on selling of pencils

$$= 2 \times 7 \times 6 \times 80 \times \frac{20}{100} = ₹1344$$

Total commission earned = 2559.2 + 1344 = ₹3903.2 \approx 3900

- 159. (b)** Required profit per cent

$$= \frac{348000 - 250000}{250000} \times 100 = \frac{98000}{250000} \times 100 = 39.2\%$$

- 160. (d)** C.P. of wheat = $30 \times 45 = ₹1350$

40% of 30 Kg = 12 Kg

S.P. of 12 Kg = $12 \times 50 = ₹600$

For 25% profit, total S.P. of all the wheat is

$$1350 \times \frac{125}{100} = 1350 \times \frac{5}{4} = ₹\frac{6750}{4} = ₹1687.5$$

Remaining wheat (30 - 12) = 18 Kg

$$\text{Rate of the remaining wheat} = \frac{1087.5}{18} \approx ₹60$$

- 161. (d)** $\frac{4080 + 3650}{2} = 3865$

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