**4. PROFIT, LOSS & DISCOUNT**

**Solutions Exercise – Easy**

1. (d) : Given that C.P. = Rs. 400, S.P. = Rs. 450

Profit = S.P. – C.P. = Rs. (450 – 400) = Rs. 50

∴ Gain % =  × 100%

=  × 100% = 12.5%

2. (d) : S.P. = 1.14 × C.P.

S.P. = × 20000

= 22800

3. (a) : Given that S.P. = Rs. 80, gain = 30%

S.P. = 1.3 × C.P.

C.P. = 

4. (b) : C.P. = Rs. 3000, Loss = 5%

S.P. = .95 × C.P.

∴ S.P. =  × 3000 = Rs. 2850

5. (c) : Let the C.P. be Rs. *x*. Then, S.P. = 1.15 C.P

∴ 1.15 × *x* = 750 ⇒ *x* = 652.1

∴ C.P. = Rs. 652.1

6. (d) : Let the C.P. be Rs. *x*. Then,

.8% of *x* = 48 ⇒  × *x* = 48 ⇒ *x* = 60.

∴ C.P. = Rs. 60, gain = 15%

∴ S.P. = Rs. (1.15 × 60) = Rs. 69

7. (b) : Let the C.P. be Rs. *x*. Then, .75 of *x* = 720.

∴  × *x* = 720 ⇒ *x* =  = 960.

Now, C.P. = Rs. 960 and gain = 20%.

∴ S.P. = Rs. (1.2 × 960) = Rs. 1152.

8. (a) : Let the C.P. be Rs. 20*x*. Then, S.P. = Rs. 23*x*

∴ Gain % =  = 15%

**Alternate Method:**



or 

So, gain = 15%

9. (d) : Let the C.P. be Rs. *x*. Then, S.P. = Rs. 

∴ Gain = Rs. 

∴ Gain % =  = 25%.

**Alternate Method:**

S.P. = 

⇒ 

So, gain = 25%

10. (d) : Let the number of pens bought be (2 × 5) = 10

C.P. of 10 pens = Rs.  = Rs. 5

S.P. of 10 pens = Rs.  = Rs. 2

Loss % =  = 60%

11. (b) : Let the man purchases 36 leamons.

C.P. of 36 leamons = 2

S.P. of 36 leamons = 3

∴ Profit (%) =  × 100 = 50%

12. (b) : S.P. = 1.16 C.P.

=  × 55972 = Rs. 48200

13. (b) : Gain = 10%

So, S.P. = 1.1 × C.P.

6160 = 1.1 × C.P.

C.P. = 

New S.P. = 6400

∴ Loss% =  × 100 = 14.28%

14. (b) : Zahid’s cost price = 600 × 

Aman’s cost price = 600 ×  = Rs. 5365

15. (b) : Total cost for Suraj = Rs. (5200 + 1000) = Rs. 6200

∴ Gain = Rs. (7000 – 6200) = Rs. 800

∴ Gain % = 

16. (c) : CP36 − SP36 = SP4

CP36 = SP40

Let the C.P. of each Mango be Rs. 1

C.P. of 40 mangoes = Rs. 40,

S.P. of 40 mangoes = Rs. 36

Loss % =  = 10%

17. (d) : Let the C.P. be Rs. *x*. Then,

(1.05 × *x*) − (.95 × *x*) 

⇒ (21*x* – 19*x*) = 2400 ⇒ 2*x* = 2400 ⇒ *x* = 1200

∴ C.P. = Rs. 1200

**Alternate Method:**

10% of C.P. = 120

So, C.P = 1200

18. (c) : Total C.P. = 2 × 1200 = Rs. 2400

S.P. at 10% loss = .9 × 1200 = Rs. 1080

S.P. at 5% gain = 1.05 × 1200 = Rs. 1260

Total S.P. = Rs. (1080 + 1260)

= Rs. 2340

∴ Loss = Rs. (2400 – 2340)

= Rs. 60

∴ Loss % =  × 100% = 2.5%

19. (c) : Let S.P. = Rs. 100

∴ C.P. =  × 100 = Rs. 70

New S.P. = 1.1 × 100 = Rs. 110

Gain = Rs. (110 – 70) = Rs. 40

∴ Gain% =  × 100% = 57%

20. (c) : Let the total cost of goods be *x*.

S.P. of 60% goods = 0.6*x* × 0.95 = 0.57*x*

S.P. of 40% goods = 0.4*x* ×1.1 = 0.44*x*

Total S.P. = 1.01*x*

Profit = 400

So, .01*x* = 400

⇒ *x* = 40000

21. (d) : Let C.P. = *x*

According to the question,

1720 – *x* = *x* – 1250

⇒ 2*x* = 1720 + 1250 = 2970

⇒ *x* =  = 1485

22. (b) : According to the formula,

Gain% =  × 100%

=  × 100%

=  × 100% = 7.53%

**Alternate Method:**

70 g. is gained on 930 g.

∴ Gain % =  × 100% = 7.53%

23. (b) : Suppose the cost price of 1000 gm is Rs. 1000

∴ Cost price of 880 gm = 1000 + 60 = Rs. 880

Selling price of 880 gm = Rs. 1060

∴ Profit = S.P. – C.P = 1060 – 880 = Rs. 180

∴ Profit % = 

24. (b) : This can be calculated as 

= 

= 

25. (c) : Let C.P. be Rs. 100. Then, M.P. = Rs. 120 and S.P. = Rs. 106.

Rate of discount =  = 11.67%

26. (c) : Let C.P. = Rs. 100, then M.P. = Rs. 115

S.P. = .9 × M.P.

∴ S.P. = Rs.  = Rs. 103.5

Gain%. = 3.5%

27. (b) : If M.P. = 100

then S.P. = 100 × .8 × .9 × .7 = 50.4

Discount = 100 – 50.4 = 49.6%

28. (b) : Let the M.P. be Rs. *x*.

C.P. in 1st case = 90% of 85% of 70% of Rs. *x*

= Rs. .90 × .85 × .70 = = Rs. 0.5355

C.P. in 2nd case = 60% of 90% of 95% of Rs. *x*

= Rs. .60 × .90 × .95 = Rs. 0.513

In II case we are getting more discount.

29. (a) : Actual weight he is selling is = 

30. (b) : Profit percentage = 

**Solutions Exercise – Medium**

1. (b) : Let the selling price of a notebook be Rs. *x*.

Then, cost price of 12 notebooks = 12*x* − 2*x* = 10x

∴ Profit % =  × 100 = 20%

2. (b) : Let the cost price of the machine be Rs. *x*.

Then, 

⇒ *x* = 40 ×  = Rs. 200

3. (b) : Now, *K* = 1.2 × 160

*K* = 192

So, Profit on *Y*

= 

4. (a) : Let he bought *x* number of CDs.

∴ (*x* – 1) × 6 = 114

⇒ *x* – 1 = 19

⇒ *x* = 20

5. (d) : Let the cost price of book be Rs. *x*.

Then, (1.2 *x* − 18) − 0.8 *x* = 0.25 × 0.8 *x*

0.4 *x* − 18 = 0.20 *x*

⇒ *x* =  = Rs. 90

6. (a) : C.P. of Ajit =  = 4040

C.P. of Mohit =  = 3600



7. (a) : Let cost price of article be Rs. *x*.

Then,

*x* × 

⇒ *x* =  × 100

= Rs. 550

8. (a) : Let the cost of the product be Rs. *x*.

Then, *x* × 1.1 × 1.15 × 1.25 = 1265

⇒ *x* = 1265 ×  = Rs. 800

9. (a) : In 1st case, the amount is Rs. 12000

In 2nd case, let the present value of money be *x*.

∴  + *x* = 12880

⇒ 0.12 *x* + *x* = 12880

⇒ *x* =  = Rs. 11500

∴ Rs. 12000 in cash is the better offer.

10. (c) : Let the cost price of one table be *x*.

Then, cost price of other table will be (2200 – *x*)

*x* ×  = 2200

⇒ 95*x* + 233200 – 106*x* = 220000

⇒ 11*x* = 13200

⇒ *x* = Rs. 1200

⇒ 2200 – *x* = Rs. 1000

11. (b) : It will be a loss given by  = 1%.

12. (a) : Note: The percentages that are given are the basic percentages derived from basic fractions. e.g. 11.11% =  and 14.28 = Hence, you should make the most of this knowledge.

So, let the C.P. be Re 1. Since he makes a profit of,

his S.P. = . His marked price should be 

above this. So if we subtract  of M.P. from the M.P., we will get

the S.P. So 

Hence, M.P. = 

Therefore, percentage of mark-up on C.P. = 

= 

= 

= 2 × 14.28

= 28.56%

**Alternative method:**

We can use the formula *z* = *x* – *y* –, where

*z* = Gain percentage

*x* = Percentage above C.P.

*y* = Discount percentage

∴ 

= 

*x* = 

*x* = × 100

*x*% = × 100 = 28.56%

13. (b) : Let the C.P. be Re. 1 per g.

but he weights 900 g. for every 1000 g.

∴ Value of goods sold = 900

Now, let the markup be *x*%

∴ M.P. = 1000 +  = (1000 + 10*x*)

but since M.P. = S.P., ∴ S.P. = (1000 + 10*x*)

Hence, Profit (%) =  × 100 = 20

⇒ *x* = 8

Thus the markup = 8%.

14. (c) : Let the cost of 1 kg be Rs. 100

He buys 1.1 kgs for Rs. 100 and sells 0.95 kgs for Rs. 100

S.P. of 1.1 kg = Rs. × 1.5 = Rs. 115.78

∴ Profit % =  × 100% = 15.78%

15. (b) : Let us assume initially he has 100 *l* of milk

So, after 10% of water addition new amount of mixture = 110 *l*

Again adding 20% more then the final amount of mixture

= 1.2 × 110 = 132 *l*

Profit % =  × 100 = 32%

16. (c) : Let the original selling price be Rs. *x*.

Then,

*x* ×  = 779

⇒ *x* =  = Rs. 1025

17. (b) : Profit percent or loss percent = + 25 − 12 −  = + 10%

As the sign is +ve. So, there is a profit of 10%.

18. (a) : S.P. = 1.15*x* × 320 = Rs. 368

And S.P. = M.P. − 32

So, M.P. = S.P. + 32 = 368 + 32 = Rs. 400

Percent Profit =  × 100 = 25%

19. (d) : Let the cost price of article be Rs. *x*.

Then, selling price of article = 0.88 *x*

Marked price of article =  × 100 × *x* = 1.1 *x*

New selling price of article = 1.045 *x*

∴ Profit % =  × 100 = 4.5%

20. (a) : Let the other discount be *x*%.

∴ 65 ×  = 56.16

⇒ 100 – *x* = 

⇒ 100 – *x* = 96

⇒ *x* = 4%

21. (c) : Selling price of first shopkeeper

= 700 × .7 × .94 = Rs. 460.60

Selling price of second shopkeeper

= 700 × .8 × .84 = Rs. 470.40

Required difference = 470.40 − 46060 = Rs. 9.80

22. (a) : S.P. = 10000 × .9 × .8 × 1.05 × 1.15 = 8694

23. (c) : Let the Marked Price be *K* & *B*.

*K* × 0.9 × 0.85 = *B* × 0.85× 0.75

⇒ 

**Alternate Method:**

Use options & check.

24. (d) : Let the S.P. of article be Rs. 100

SP1 = 1.75 CP1

o, CP1 = 

Also, SP2 = .7 CP2

So, CP2 = 

Total C.P. = 200, Total S.P. = 200

So, there is no profit no loss.

25. (b) : Total amount after one year

= 8000 ×  = Rs. 9200

Total amount after 2nd year = 9200 ×  = 7820

∴ Loss % =  × 100 = 2.25%

**Alternate Method:**

When a value is increased and then decreased by same percentage, then the value is always decreased and it is

decreased by 

So, loss percent =  = 2.25%

26. (d) : Required number of items = 

=  = 200

27. (b) : *A* ⇒ *x* × .8 × .9

*B* ⇒ *x* × .85 × .8

*C* ⇒ *x* × .85 × .87

Thus it is clear from the graphical solution that the maximum discount is availed by B.

[**Note:** It does not matter that we first decrease by 20% and then by 5% or vice - versa.]

28. (d) : Let manufacture C.P. = 100

then his S.P. would be = 1.1 × 10 = 110 it is distributor’s C.P.

then distributor S.P. 1.1 × 110 = 121

Dealer S.P. = 1.2 × 121 = 145.2

Retailer S.P. = 1.2 × 145.2 = 174.24

After Discount = .9 × 174.24 = 156.816

If he had bought from distributor he would save = 35.816

Percentage reduction = 

29. (b) : Assume his C.P. = Rs. 1000 / 1100 g

M.P. = Rs. 1200 and S.P. = Rs. 960 / 900 g

So, S.P. / 1000 g = Rs. 1173.33

So, profit = Rs. 173.33

Profit percentage = 17.33%

30. (a) : Let C.P. for 1000 g = Rs. 1000

So, M.P. = Rs. 1400

S.P. = Rs. 1260

Now, when he sells 1000 g, he actually obtains the money only for 800 g. [**Note:** Go through statement carefully.]

So, when he sells articles worth Rs. 1000, money obtained after selling will be equal to = 1260 × 0.8 = 1008

So, profit percentage = 0.8%

**Solutions Exercise – Difficult**

1. (a) : We know that Profit percentage = 20%. So, S.P. = 1.2 C.P. This profit is made after the loss that he has incurred by selling

16 articles at the price of 12. This loss would be. So his actual S.P. × 0.75 = 1.2 C.P. So, his actual S.P. = 1.6 C.P. Also his actual S.P. = 0.8 M.P. Therefore 0.8 M.P. = 1.6 C.P. or M.P. = 2 C.P. This means that he had marked his goods 100% above his C.P.

2. (b) :

|  |  |  |
| --- | --- | --- |
|  | Pencil | Pen |
| C.P. | *a* | *c* |
| S.P. | *b* | *d* |

and *c* = 2*a*

Profit = 10 (*b* – *a*) = 3*d*

and Loss = 10 (*c* – *d*) = 4*b*

Profit (%) =  × 100

and Loss (%) =  × 100

Again 

⇒  ( *c* = 2*a*)

⇒ 

3. (b) : Let the C.P. of one article be Rs. 1

then the S.P. be Rs. 1.25

Again the new S.P. be (1.25) × 1.15 = 1.4375

New S.P. = 75 × 1.4375 = 107.8 (since 25% articles were abducted)

∴ New profit percentage = 7.8 %

4. (d) : Let cost for the manufacturer machine be *x*.

Then, *x* × 1.1 × 1.2 × .95 = 672

*x* = 535.88

Hence, the option none of these is correct.

5. (b) :

|  |  |  |
| --- | --- | --- |
| Fresh grapes | | |
| Water |  | Pulp |
| 80% |  | 20% |
| 4 | : | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Dry Grapes | | |  |
|  | Water |  | Pulp |  |
|  | 25% |  | 75% |  |
|  | 1 | : | 3 |  |
| +(110 kg) | 10 kg |  | 30 kg | out of 40 kg dry grapes |
| 80% |  | 20% | Required  proportion of  water and pulp |
| 4 |  | 1 |
| 120 kg |  | 30 kg |

Thus to make dry grapes similar to the fresh grapes, Ashraf required to add 110 kg water with 40 kg of dry grapes.

So, the profit (%) =  × 100 = 275%

6. (c) : It means that he has lesser goods to sell than the number he had bought.

Let us assume that he buys 100 items at Re. 1 per item.

Therefore, his total cost = Rs. 100

5% of the items he had bought end up as wastage

5% of 100 items = 5 items. Therefore he has only 100 – 5 = 95 items to sell.

He wishes to make a 10% profit on his cost of Rs. 100 = Rs. 10 profit.

Therefore, his selling price = Cost Price + Profit = Rs. 100 + Rs. 10 = Rs. 110

He has only 95 items to sell at Rs. 110. Therefore the price per

item =  = Rs. 1.158

So he has to mark his goods up by Rs. 0.158 per item.

% mark up =  = 15.8%

7. (b) : Profit percentage in each case is:

I. Profit = 10%

II. Profit = 

III. Profit = 

V. Profit = 

8. (d) : Discount on articles =  × 100 = 6.25%

Overall discount = – 4 – 6.25 +  = – 10%

Let cost price = Rs. 100, then

selling price = Rs. 135

So, 90% of marked price = 135

Marked price =  = Rs. 150

Marked price is increased by =  × 100 = 50%

9. (c) : Cost price of garments = Rs. 25000

Original company price =  × 100

∴ Selling price of garments = 

= Rs. 31764.71

10. (d) : Let the number of calendars (produced) be 100 and the cost price of a calendar be Re. 1 then

Total cost incurred = 100 × 1 = 100

Total sale price = 32 × 0.60 + 60 × 1.4 = 103.2

Therefore profit = Rs. 3.2

Thus there is 3.2% profit.

11. (a) : Let the price per cm of cloth be Re. 1. The shopkeeper buys 120 cm, but pays for only 100 cm. In other words, he buys 120 cm for Rs. 100. So, his C.P. =  = Re. 0.833 per metre. Now he sells 80 cm, but charges for 100 cm. In other words, he sells 80 cm for Rs. 100. On this he offers a 20% discount on cash payment. So, he charges Rs. 80 for 80 cm cloth. In other words, his S.P. =  = Re. 1 per cm. So his percentage profit in the overall transaction

= 

12. (b) : Total expense incurred in making 1,500 watches

= (1500 × 150) + 30000 = Rs. 2,55,000.

Total revenue obtained by selling 1,200 of them during the season = (1200 × 250) = Rs. 3,00,000. The remaining 300 of them has to be sold by him during off season. The total revenue obtained by doing that = (300 × 100) = Rs. 30,000.

Hence, total revenue obtained = (300000 + 30000)

= Rs. 3,30,000.

Hence, total profit = (330000 – 255000) = Rs. 75,000.

13. (b) : From the previous solution, we can see that the total expense incurred by him in manufacturing 1,500 watches = Rs.2,55,000. In order to break-even, he has to make a minimum revenue in order to recover his expenditure. He gets Rs. 250 per watch sold and Rs. 100 on every watch not sold. Let him sell *x* watches to break-even. So our equation will be 250*x* + 100(1500 – *x*) = 255000. Solving this, we get *x* = 700 watches.

14. (a) : Let us assume that the total production cost is Rs. 100. So, component *A*’s share in this would be Rs. 30 and that of *B* would be Rs. 50.

Thus, we can see that there is a component of (100 – 30 – 50)

= Rs. 20, that constitutes other expenses. The product is currently sold at 20% profit = Rs. 120. Now due to change in international scenario, cost of component *A* increases by 30% to Rs. 39 and the cost of component *B* by 22% to Rs. 61. Hence, the total cost of production of the product = (39 + 61 + 20) = Rs. 120

[Note: No change has been indicated in other expenses.]

It is further said that selling price cannot be increased beyond 10%. Hence, the maximum selling price can be Rs. 132. This means that the maximum gain can only be  = 10%.

15. (b) : The cost of component *A* will now be

(1.2 × 30) = Rs. 36 and that of *B* will be

(0.88 × 50) = Rs. 44

So the total cost of production

= (36 + 44 + 20) = Rs. 100

Since the selling price is not altered, *i.e*. Rs. 120, the gain will be the same as the original one, *i.e*. 20%.