

PERCENTILE CLASSES

Profit & Loss

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Profit & Loss

Introduction:

Cost Price: The amount paid to purchase an article or the price at which an article is made, is known as its cost price.

The cost price is abbreviated as C.P..

Selling Price: The price at which an article is sold, is known as its selling price.

The selling price is abbreviated as S.P..

Profit: If the selling price (S.P.) of an article is greater than the cost price (C.P.), then the difference between the selling price and cost price is called profit.

Thus, If $S.P. > C.P.$, then

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

$$\Rightarrow S.P. = C.P. + \text{Profit}$$

$$\Rightarrow C.P. = S.P. - \text{Profit}$$

Loss: If the selling price (S.P.) of an article is less than the cost price (C.P.), then the difference between the cost price (C.P.) and the selling price (S.P.) is called loss.

Thus, if $S.P. < C.P.$, then

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

$$\Rightarrow C.P. = S.P. + \text{Loss}$$

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

Profit and Loss percentage

The profit per cent is the profit that would be obtained for a C.P. of Rs. 100.

Similarly, the loss per cent is the loss that would be made for a C.P. of Rs 100.

$$\text{Profit per cent} = \frac{\text{Profit}}{C.P.} \times 100$$

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

Remember

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

Real Profit/Loss percentage:

If the profit or loss is calculated on S.P., then it is not actual profit or loss.

Real profit (loss)% is the profit (loss)% on C.P.

$$\text{Real Profit \%} = \frac{\% \text{profit on S.P.}}{100 - \% \text{profit on S.P.}} \times 100$$

Dishonest dealing

$$\text{Gain \%} = \frac{\text{Error}}{\text{True value} - \text{Error}} \times 100$$

$$\frac{\text{True Scale}}{\text{False Scale}} = \frac{100 + \text{gain \%}}{100 - \text{loss \%}}$$

Goods passing through successive hands

When there are two successive profits of $a\%$ and $b\%$, then the resultant profit per cent is given by

$$\left(a + b + \frac{ab}{100} \right) \%$$

When there is a profit of $a\%$ and loss by $b\%$ in a transaction, then the resultant profit or loss per cent is given by $(a - b - \frac{ab}{100})\%$, according to the +ve or -ve sign respectively.

When cost price and selling price are reduced by the same amount (A) and profit increases then cost price (C.P.)

$$= \frac{[Initial\ profit\ \% + Increase\ in\ profit\%] \times A}{Increase\ in\ profit\%}$$

Note:

When no discount is given, 'selling price' is the same as 'marked price'.

- $Discount = Marked\ price \times Rate\ of\ discount.$
- $S.P. = M.P. - Discount.$
- $Discount\ \% = \frac{Discount}{M.P.} \times 100.$

When no discount is given, 'selling price' is the same as 'marked price'.

- $Discount = Marked\ price \times Rate\ of\ discount.$
- $S.P. = M.P. - Discount.$
- $Discount\ \% = \frac{Discount}{M.P.} \times 100.$
- Buy x get y free i.e., if $x + y$ articles are sold at cost price of x article, then the percentage discount = $\frac{y}{x+y} \times 100$.
- A man purchases a certain number of articles at x a rupee and the same number at y a rupee. He mixes them together and sells them at z a rupee. Then his gain or loss %
 $= \left[\frac{2xy}{z(x+y)} - 1 \right] \times 100$ according as the sign is +ve or -ve.
- If two items are sold, each at Rs. x , one at a gain of $p\%$ and the other at a loss of $p\%$, there is an overall loss given by $\frac{p^2}{100}\%$.
The absolute value of the loss is given by $\frac{2p^2x}{100^2-p^2}$.
- If CP of two items is the same and % Loss and % Gain on the two items are equal, then net loss or net profit is zero.

Remember:

In successive discounts, first discount is subtracted from the marked price to get net price after the first discount. Taking this price as the new marked price, the second discount is calculated and it is subtracted from it to get net price after the second discount.

Continuing in this manner, we finally obtain the net selling price. In case of successive discounts $a\%$ and $b\%$, the effective discount is $(a + b - \frac{ab}{100})\%$.

Example:

Find the single discount equivalent to successive discounts of 15% and 20% .

Solution:

By direct formula,

$$\begin{aligned} \text{Single discount} &= \left(a + b - \frac{ab}{100} \right)\% \\ &= \left(15 + 20 - \frac{15 \times 20}{100} \right)\% = 32\% \end{aligned}$$

Note:

If the list price of an item is given and discounts d_1 and d_2 are given successively on it then,

$$\text{Final price} = \text{list price} \left(1 - \frac{d_1}{100} \right) \left(1 - \frac{d_2}{100} \right).$$

Exercise - 01

1. By selling a cap for Rs. 34.40, a man gains 7.5%. What will be the CP of the cap?
(a) Rs. 32.80 (b) Rs.32 (c) Rs. 32.40 (d) Rs. 28.80
2. A machine costs Rs 375. If it is sold at a loss of 20%. What will be its cost price as a percentage of its selling price?
(a) 80% (b) 120% (c) 110% (d) 125%
3. A digital diary is sold for Rs. 935 at a profit of 10%. What would have been the actual profit or loss on it, if it had been sold for Rs. 810?
(a) Rs.45 (b) Rs.40 (c) Rs.48 (d) Rs.50
4. By selling bouquets for Rs. 63, a florist gains 5%. At what price should he sell the bouquets to gain 10% on the cost price?
(a) Rs.66 (b) Rs.69 (c) Rs.72 (d) Rs. 72.50
5. A coal merchant makes a profit of 20% by selling coal at Rs. 25 per quintal. If he sells the coal at Rs. 22.50 per quintal, what is his profit per cent on the whole investment?
(a) 6% (b) 6.66% (c) 7.5% (d) 8%
6. A pet shop owner sells two puppies at the same price. . On one he makes a profit of 20% and on the other he suffers a loss of 20%. Find his loss or gain per cent on the whole transaction,
(a) Gain of 4% (b) No profit no loss (c) Loss of 10% (d) Loss of 4%
7. A dozen pairs of gloves quoted at Rs. 80 are available at a discount of 10%. Find how many pairs of gloves can be bought for Rs. 24.
(a) 4 (b) 5 (c) 6 (d) 8
8. An article is bought for Rs.600 and sold for Rs.750, what is the profit percentage?
(a) 20% (b) 25% (c) 30% (d) none of these
9. By selling a VCD player for Rs.1950, I got a profit of 30% at what price should I have sold it in order to get a profit of 40%?
(a) Rs.2000 (b) Rs.2100 (c) Rs.2500 (d) none of these
10. By selling a cd for Rs.150, a shop owner lost $\frac{1}{16}$ of what is costs, what is the cost price of cd?
(a) Rs.120 (b) Rs.140 (c) Rs.150 (d) Rs.160
11. Saurabh sold 250 cycle and has a gain equal to the selling price of 50 cycle. What is his profit percentage?
(a) 25% (b) 20% (c) 10% (d) none of these
12. A man buys 200 oranges for Rs.10. How many oranges a rupee can he sell so that his profit percentage is 25%?
(a) 10 (b) 14 (c) 16 (d) 20
13. The owner of book point does not get either profit or loss by selling 15 books for Rs.225. How many books should he sell for the same amount to gain 25% profit?
(a) 10 (b) 11 (c) 12 (d) 13

14. A shopkeeper professes to sell his articles at CP but gives only Ng in the place of 1000g. if his profit percentage is 100% what is the value of N?
(a) 750` (b) 500 (c) 0 (d) none of these
15. A supplier sells 20 pencils at the marked price of 16 pens to a retailer. The retailer, in turn, sells them at the marked price. What is the percentage profit or percentage loss of the retailer?
(a) Loss 25% (b) Profit 25% (c) Loss 20% (d) Profit 20%
16. A wholeseller supplies few chips to a retailer every year. Each chip costs Rs.10,000 to the wholeseller. 5% of the chips are defective and they are to be replaced without charging anything extra. If the wholeseller still makes a profit of 20%, at what price is he selling it to retailer?
(a) Rs.12,300 (b) Rs.12,600 (c) Rs.13,200 (d) None of these
17. When an article is sold for Rs.180, a profit of 20% is made. At what price should the article be sold so that profit percentage is double?
(a) Rs.120 (b) Rs.210 (c) Rs.192 (d) Rs.240
18. The cost price of a scooter is Rs. 20000 and the profit percent is 12%. What is the selling price?
(a) 2400 (b) 22040 (c) 2600 (d) 22400
19. The CP of an article is $\frac{5}{6}$ th of the SP. What is the percentage profit or loss?
(a) 20% loss (b) 16.66% profit (c) 16.66% loss (d) 20% profit
20. An article is sold for Rs. 1980 at 10% profit. What is the cost price?
(a) Rs. 198 (b) Rs. 1800 (c) Rs. 1900 (d) Rs. 1600
21. The per cent profit made when an article is sold for Rs. 56 is thrice as when it is sold for Rs. 42. The cost price of the article is:
(a) Rs. 48 (b) Rs. 49 (c) Rs. 50 (d) Rs. 35
22. A trader sells two articles, one at a loss of 10 % and another at a profit of 15% but finally there is no loss or gain, if the total sale price of these two articles is Rs. 30,000 find the difference between their cost prices.
(a) Rs. 5000 (b) Rs. 6000 (c) Rs. 7500 (d) none of these
23. 60% goods are sold at 5% loss while rest are sold at 10% profit. If there is a total profit of Rs. 100, then the worth of goods sold is:
(a) Rs. 6000 (b) Rs. 5000 (c) Rs. 10000 (d) none of these
24. A dealer gives as much discount (in per cent) as the markup (in per cent) above the cost price. What is the profit or loss per cent?
(a) 10% (b) 1% (c) 4% (d) can't be determined
25. A trader sells 20 kg of sugar at Rs. 400. A customer asks 20% discount and he agrees to it but instead of 1 kg he gives 4% less sugar. What is the effective discount that the customer gets?
(a) 16% (b) 16.66% (c) 15.5% (d) 19.6%
26. A single discount equivalent to three successive discounts of 5%, 10%, 20% is :
(a) 68.4% (b) 35% (c) 31.6% (d) 32%
27. On selling an article for Rs. 240, a trader loses 4%. In order to gain 10% he must sell that article for :

(a) Rs. 275

(b) Rs. 340

(c) Rs. 320

(d) Rs. 264

28. An item costing Rs. 200 is being sold at 10% loss, if the price is further reduced by 5%, the selling price will be (a) Rs. 170 (b) Rs. 171 (c) Rs. 180 (d) Rs. 181
29. Arun bought toffees at 6 for a rupee. How many for a rupee he should sell to gain 20%? (a) 3 (b) 4 (c) 5 (d) can't be determined
30. The cost price of 19 articles is same as the selling price of 29 articles. What is the loss? (a) 35% (b) 34.48% (c) 52.63% (d) none of these
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Exercise - 02

1. 125 toffees cost Rs. 75. Find the cost of one million toffees if there is a discount of 40% on the selling price for this quantity.
(a) Rs.3,00,000 (b) Rs. 3,20,000 (c) Rs. 3,60,000 (d) Rs. 4,00,000
2. In order to maintain the price line, a trader allows a discount of 10% on the marked price of goods in his shop. However, he still makes a gross profit of 17% on the cost price. Find the profit per cent he would have made on the selling price had he sold at the marked price,
(a) 23.07% (b) 30% (c) 21.21% (d) 25%
3. The cost of production of a cordless phone set in 2011 is Rs. 900, divided between material, labour and overheads in the ratio 3:4:2. If the cordless phone set is marked at a price that gives a 20% profit on the component of price accounted for by labour, what is the marked price of the set?
(a) Rs.980 (b) Rs.1080 (c) Rs.960 (d) Rs.1020
4. By selling a casserole for Rs. 960, a man incurs a loss of 4%. At what price should he sell the casserole to gain 16%?
(a) Rs.1160 (b) Rs.1080 (c) Rs.1120 (d) None of these
5. A owns a house worth Rs. 10,000. He sells it to B at a profit of 15%. After some time, B sells it back to A at 15% loss. Find A's loss or gain percent,
(a) 2.25% gain (b) 6.25% gain (c) 17.64% gain (d) 17.25% gain
6. A shopkeeper bought locks at the rate of 8 locks for Rs. 34 and sold them at the rate of 12 locks for Rs. 57. Calculate his gain percent.
(a) 9.33% (b) 12.5% (c) 11.11% (d) 11.76%
7. A reduction of 10% in the price of sugar enables a housewife to buy 6.2 kg. more for Rs. 279. Find the reduced price per kilogram
(a) Rs.5 (b) Rs.4.5 (c) Rs.4.05 (d) None of these
8. A dealer buys eggs at Rs.36 per gross. He sells the eggs at a profit of $12\frac{1}{2}\%$ on the cost price. What is the selling price per egg (approximately)?
(a) 33paise (b) 30paise (c) 29paise (d) 28paise
9. A sold a table to B at a profit of 15%. Later on, B sold it back to A at a profit of 20%. thereby gaining Rs. 69. How much did A pay for the table originally?
(a) Rs.300 (b) Rs.320 (c) Rs.345 (d) Rs. 350
10. A colour TV and a VCP were sold for Rs. 12,000 each. The TV was sold at a loss of 20% whereas the VCP was sold at a gain of 20%. Find gain or loss in the whole transaction.
(a) Rs. 1200 loss (b) Rs. 1000 loss (c) Rs.960 loss (d) Rs. 1040 loss
11. A man sells an article at 5% above its cost price. If he had bought it at 5% less than what he paid for it and sold it for Rs. 2 less, he would have gained 10%. Find the cost price of the article.
(a) Rs.500 (b) Rs.360 (c) Rs.425 (d) Rs.400
12. CP of 12 apples is equal to the SP of 9 apples and the discount on 10 apples is equal to the profit on 5 apples, what is the percentage difference between the CP and SP of apples?

- (a) 20% (b) 25% (c) 16.66% (d) none of these

13. There are two shopkeepers selling the same article at the same price for same quantity. One day, first shopkeeper offers a price discount of 25% for the same quantity, whereas second shopkeeper offers 25% more quantity for the same price. From a customer's point of view,
Which deal is better?
(a) First shopkeeper's deal (b) Second shopkeeper's deal
(c) Both are equal (d) Cannot be determined

14. Vinit sells a car to Amit at a profit of 20%. Now Amit sells this car to Vicky at a profit of 12% and finally Vicky sells this car to Nishu at a loss of 21%. What is the sum of CPs of Amit and Nishu?
(a) Rs.250 (b) Rs.475 (c) Rs.540 (d) cannot be determined

15. When an article is sold for Rs.X, loss percentage is equal to L%. However, when the same article is sold for Rs.Y, profit percentage is equal to P%. What is the CP of that article?
(a) $100(P + L)/(Y-X)$ (b) $(P + L)/(Y - X)$
(c) $100(Y-X)/(P + L)$ (d) $(Y - X)/(P + L)$

16. A seller offers discounts on the basis of the number of articles purchased. He gives a discount of 10% when 5 articles are bought and a discount of 12.5% when 8 articles are bought. If the profit he makes in each case is the same, find the ratio of the marked price to the cost price of the article.
(a) 4 : 3 (b) 3:4 (c) 6:5 (d) None of these

17. A shopkeeper purchases a packet of 50 pencils at Rs.10 per pencil. He sells a part of the packet at a profit of 30%. On the remaining part, he incurs a loss of 10%. If his overall profit on the whole packet is 10%, find the number of pencils he sold at profit.
(a) 25 (b) 30 (c) 20 (d) 15

18. What is the profit percentage of a dishonest cloth merchant who professes to sell his articles at CP but uses a scale which weighs less by 16.67%?
(a) 20 (b) 15 (c) 16 (d) None of these

19. Santa Singh, the local fruit vendor, buys a certain number of oranges at Rs.7 a dozen and equal number at Rs.6 a dozen. He sells the oranges at Rs.7.50 a dozen and makes a profit of Rs.80. How many oranges does he buy?
(a) 20 dozens (b) 30 dozens (c) 40 dozens (d) 80 dozens

20. A man sells a bicycle at a gain of 10% if he had bought it at 10% less and sold it for Rs. 132 less he would have still gained 10% the cost price of the article is:
(a) Rs. 1000 (b) Rs. 1200 (c) Rs. 1500 (d) Rs. 1320

21. A retailer buys a cellphone at a discount of 15% and sells it for Rs. 5865 thus, he makes a profit of 15%. The discount is:
(a) Rs. 200 (b) Rs. 850 (c) Rs. 750 (d) Rs. 900

22. A merchant marks his goods at Rs. 900 and allows a discount of 25%. If he still gain 12.5% then the cost price of the article is:
(a) Rs. 500 (b) Rs. 600 (c) Rs. 720 (d) can't be determined

23. A vendor buys oranges @ Rs. 2 for 3 oranges and sells them at a rupee each. To make a profit of Rs. 10, he must sell:
(a) 10 oranges (b) 20 oranges (c) 30 oranges (d) 40 oranges
24. A trader uses a weighing balance that shows 1250 g for a kilogram. He further marks-up his cost price by 20%. What is the profit percentage?
(a) 5% (b) 45% (c) 50% (d) 30%
25. ITC sells one product at a profit of 20% another at a loss of 20% at the same selling price. What is the loss incurred by ITC?
(a) 1% (b) 2% (c) 4 % (d) 0%
26. The selling price of 13 articles is same as the cost price of 23 articles. what is the profit percentage?
(a) 43.47% (b) 74.83% (c) 78% (d) 76.92%
27. A vendor sells his articles at a certain profit percentage. If he sells his articles at $\frac{1}{3}$ of his actual selling price, then, he incurs a loss of 40% what is his actual profit percentage?
(a) 72% (b) 120% (c) 80% (d) none of these
28. A car mechanic purchased four old cars for Rs. 1 lakh. He spent total 2 lakh in the maintenance and repairing of these four cars. What is the average sale price of the rest three cars to get 50% total profit if he has already sold one of the four cars at Rs. 1.2 lakh?
(a) 1.5 lakh (b) 1.1 lakh (c) 1.2 lakh (d) 1.65 lakh
29. Pratibha printers prepares diaries expecting to earn a profit of 40% by selling on the marked price. But during transportation 8% diaries were got spoiled due to at random rain and 32% could be sold only at 75% of the cost price. Thus the remaining 60% diaries could be sold at the expected price. What is the net profit or loss in the whole consignment?
(a) 6% (b) 10% (c) 8% (d) can't be determined

Exercise - 03

- (a) Rs.145 (b) Rs.18 (c) Rs.22 (d) Rs.20

12. By selling a watch at a profit of 10 percent, a man got Rs.15 more than half its price. What is the price of the watch?
(a) 10 (b) 15 (c) 25 (d) 5

13. A shopkeeper uses a 'point of sales' software which prepares the bill for customers based on the number of units per unit. Both of the above are 2-digit numbers. While entering the data, he erroneously swaps the digits of both quantity of units and price. As a result, the closing stock balance is lowered by 72 units, and the sales value shown is Rs.1,368. How many units have actually been sold?
(a) 27 (b) 91 (c) 83 (d) None of these

14. Mahesh and Umesh purchased a radio each for the same price and both marked-up their respective radios by the same amount. Mahesh gave a discount of Rs.20 followed by another discount of 20% on the reduced price, while Umesh gave a discount of 20% followed by a discount of Rs.20. If Mahesh's profit percentage is equal to thrice of Umesh's loss percentage, what is the profit (in Rs.) of Mahesh on his radio?
(a) Rs. 2 (b) Rs.3 (c) 4Rs. (d) Rs.5

15. A spring balance reads 1 kg when actually 800 g is weighed on it. The shrewd grocer has already marked up the price of his goods by 20%. One day, a police inspector detects this and orders him to repair his spring balance and revert to the original list price of the goods. Moreover, he asked him to give a discount of 10% to all the customers for a month from then onwards as a punishment. A day after, Ramu paid Rs.16 for 1 kg rice. Before the raid, how much he would have paid for the same quantity?
(a) Rs.26.66 (b) Rs.27.5 (c) Rs.24 (d) Rs.28

16. A trade uses a weight of 920 g instead of 1 kg and sells the articles at the marked price which is 15% above the cost price. Find the profit percentage.
(a) 20% (b) 23% (c) 25% (d) can't be determined

17. A retailer cheats both to his whole seller and his customer by 10% by his faulty balance i.e. he actually weights 10% more while purchasing from wholesaler and weights 10% less while selling to his customer. What is his net profit percentage, when he sells at CP?
(a) $22\frac{2}{11}\%$ (b) $22\frac{2}{9}\%$ (c) 20% (d) 21%

18. A reduction of 20% in the price of sugar enables a housewife to purchase 6 kg more for Rs. 240. What is the original price per kg of sugar?
(a) Rs 10 per kg (b) Rs. 8 per kg (c) Rs. 6 per kg (d) 5 per kg

19. A retailer bought 3850 Line pens and 1848 Cello pens at the same price. He sells line pens in such a way that he can buy 650 Line pens with the sale price of 480 Line pens. Again he can buy only 408 Cello pens with the sale price of 629 pens. What is the overall percentage of profit of the retailer?
(a) 4.8% (b) 9.6% (c) 13% (d) none of these

20. Anna sold his car to Boney at a profit of 20% and Boney sold it to chakori at a profit of 10%. Chakori sold it to mechanic at a loss of 9.09%. Mechanic spent 10% of his purchasing price and then sold it at a profit of 8.33% to anna once again. What is the loss of anna?
(a) 23% (b) 29% (c) 50% (d) 40%

21. I asked the shopkeeper the price of a wristwatch. I found that I had just the required sum of money. When the shopkeeper allowed me a discount of 25%, I could buy another watch worth Rs. 940 for my younger sister. What is the price which I have paid for my own watch?
(a) Rs. 2700 (b) Rs. 1800 (c) Rs. 2820 (d) Rs. 3760

22. A trader sells goods to a customer at a profit of $k\%$ over the cost price, besides it he cheats his customer by giving 880 g only instead of 1 kg. Thus his overall profit percentage is 25%. Find the value of k ?
(a) 8.33% (b) 8.25% (c) 10% (d) 12.5%

23. A trader sells two brands of petrol; one is Extra Premium (EP) and other one is 'Speed' (SP). He mixes 12 litres of EP with 3 litres of speed and by selling this mixture at the price of EP he gets the profit of 9.09%. If the price of Extra Premium be Rs. 48 per litre, then the price of Speed (SP) is:
(a) Rs. 38 per litre (b) Rs. 42 per litre
(c) Rs. 28 per litre (d) none of these

24. A, B and C invest in the ratio of 3 : 4 : 5. The percentage of return on their investments are in the ratio of 6 : 5 : 4. Find the total earnings, if B earns Rs. 250 more than A :
(a) Rs. 6000 (b) Rs. 7250 (c) Rs. 5000 (d) none of these

Exercise - 04

1. A manufacturer makes a profit of 15% by selling a color TV for Rs. 5750. If the cost of manufacturing increases by 30% and the price paid by the retailer is increased by 20%, find the profit percent made by the manufacturer.
(a) $6(2/13)\%$ (b) $4(8/13)\%$ (c) $6(1/13)\%$ (d) $7(4/13)\%$
2. How much percent more than the cost price should a shopkeeper mark his goods so that after allowing a discount of 12.5% he should have a gain of 5% on his outlay?
(a) 9.375 (b) 16.66% (c) 20% (d) 25%
3. The cost price of 50 mangoes is equal to the selling price of 40 mangoes, find the percentage profit.
(a) 20% (b) 25% (c) 30% (d) none of these
4. Anil bought an article at Rs.200 and sold it at a profit of 10% what would have been that increase in the profit percentage if it was sold for Rs.230?
(a) 5% (b) 10% (c) 15% (d) None of these
5. A tradesman fixed his selling price of goods at 30% above the cost price. He sells half the stock at this price, one-quarter of his stock at a discount of 15% on the original selling price and rest at a discount of 30% on the original selling price. Find the gain percent altogether.
(a) 14.875% (b) 15.375% (c) 15.575% (d) 16.375%
6. Cheap and Best, a *kirana* shop bought some apples at 4 per rupee and an equal number at 5 per rupee. He then sold the entire quantity at 9 for 2 rupees. What is his percentage profit or loss?
(a) 1.23% loss (b) 6.66% (c) 8.888% (d) No profit no loss
7. Deb bought 100 kg office for Rs. 1100 and sold it at a loss of as much money as he received for 20 kg rice. At what price did he sell the rice?
(a) Rs. 9 per kg (b) Rs. 9.1666 per kg (c) Rs. 9.5 per kg (d) Rs.10.33 per kg
8. A shopkeeper calculates percentage profit on the buying price and another on the selling price. What will be their difference in profits if both claim a profit of 20% on goods sold for Rs. 3000?
(a) Rs.200 (b) Rs.100 (c) Rs.400 (d) Rs.150
9. A merchant makes a profit of 20% by selling an article. What would be the percentage change in the profit percent had he paid 10% less for it and the customer paid 10% more for it?
(a) 120% (b) 125% (c) 133.33% (d) 150%
10. An article costing Rs. 20 was marked 25% above the cost price. After two successive discounts of the same percentage, the customer now pays Rs. 20.25. What would be the percentage change in profit had the price been increased by the same percentage twice successively instead of reducing it?
(a) 3600% (b) 3200% (c) 2800% (d) 4000%
11. Jonny has two cycles and one rickshaw. The rickshaw is worth Rs. 96. If he sells the rickshaw along with the first cycle, he has an amount double that of the value of the second cycle. But if he decides to sell the rickshaw along with the second cycle, the amount received would be less than the value of first cycle by Rs.306. What is the value of first cycle?
(a) Rs.900 (b) Rs.600 (c) Rs.498 (d) None of these

what is the approximate minimum advertising booking required if the newspaper has to breakeven on a particular day. (assume there is not wastage)

21. A retailer keeps Reebok shoes, which are listed at a mark-up of 10% above their factory price. However on Monday he realized the shortage of demand and hence decreased the list price by 10% . On the very next day,

In is Tuesday, he realized he is making a loss so, he increased the list price by 10% again. He continues this trend indefinitely on which day, he will suffer a loss of more than 10% per shoes or the first time?

- (a) Monday (b) Tuesday (c) Thursday (d) Sunday

22. I wanted to purchase 10 chairs for the class room whose cost was Rs. 200 each. The the trader offered me a discount if I were to purchase a set of 12 chairs. So I calculated that if I assume the normal price of 10 chairs then we can purchase 2 extra chairs which cost me only Rs. 80 each of two chairs at the cost price of 12 chairs after discount. What is the percentage discount?

23. Anjuli, Bhumika and Chawla went to market to purchase the rigs whose costs were same. But each ring was available with two successive discounts. Anjuli availed two successive discounts of 5% and 20%. Bhumika availed two successive discounts 10% and 15% while Chawla availed two successive discounts of 12% and 13%. Who gets the maximum possible discount?

- (a) Anjuli (b) Bhoomika (c) Chawla (d) all of these

24. Profit on selling 10 candles equals selling price of 3 bulb. While loss on selling 10 bulbs equals selling price of 4 candles. Also profit percentage equals to the loss percentage and cost of a candle is half of the cost of a bulb, what is the ratio of selling price of candle to the selling price of a bulb?

- (a) $5:4$ (b) $3:2$ (c) $4:5$ (d) $3:4$

Exercise - 05

TITA/SA

1. A manufacturer estimates that on inspection 12% of the articles he produces will be rejected. He accepts an order to supply 22,000 articles at Rs. 7.50 each. He estimates the profit on his outlay including the manufacturing of rejected articles, to be 20%. Find the cost of manufacturing each article.

2. A dishonest dealer marks up the price of his goods by 20% and gives a discount of 10% to the customer. He also uses a 900 gram weight instead of a 1 kilogram weight. Find his percentage profit due to these maneuvers.

3. A dealer marks articles at a price that gives him a profit of 30%. 6% of the consignment of goods was lost in a fire in his premises, 24% was soiled and had to be sold at half the cost price. If the remainder was sold at the marked price, what percentage profit or loss did the dealer make on that consignment?

4. Some mangoes are purchased at the rate of 8 mangoes/Rs. and some more mangoes at the rate of 6 mangoes/Rs., investment being equal in both the cases. Now, the whole quantity is sold at the rate of 7 mangoes/Rs. What is the net percentage profit/loss?

5. While returning from Dubai festival, Mr Sanjay Singh purchased a number of articles, all at a discount of $33\frac{1}{3}\%$ of the list price. However, he is required to pay a duty of 20% on the his cost of goods. If he realizes a profit of 25% on his outlay, what must he charge for an article priced Rs.228 as the list price?

6. A publisher printed 3000 copies of '*Future Shock*' at a cost of Rs.2400. He gave 500 copies free to different philanthropic institutions. He allowed a discount of 25% on the published price and gave one copy free for every 25 copies bought at a time. He was able to sell all the copies in this manner. If the published price is Rs.3.25, then what is his overall gain or loss percentage in the whole transaction?

7. A towel is sold or Rs. 198 at a gain o 10 % what is the cost price of the towel? At what price must it be sold to gain 25%?

8. A man sold a watch at Rs. 6000. At a loss o $33\frac{1}{3}\%$ find the cost price?

9. By selling a shirt for Rs. 285 a shopkeeper loses 5%. At what price should he sell the shirt so as to gain 15%?

10. What is percentage profit in selling an article at a discount of 20% which was earlier being sold at a 40% profit?

11. A dealer buys a product at Rs. 1920, He sells at a discount of 20% still he gets the profit of 20%. What is the selling price of that product?

12. The profit percentage on the three articles A, B and C is 10% 20% and 25% and the ratio of the cost price is 1: 2: 4. Also the ratio of number of articles sold of A, B and C is 2: 5: 2 then the overall profit percentage is :

13. A merchant marks his goods at Rs. 300 and allows a discount of 25%. If he still gains 12.5%, then the cost price of article is:

14. Titan sells a wrist watch to a wholesaler making a profit of 10%. The wholesaler, in turn, sells it to the retailer making a profit of 10%. A customer purchases it by paying Rs. 990. Thus the profit of retailer is $2\frac{3}{11}\%$ what is the cost incurred by the Titan to produce it?

15. When an article is sold for Rs. 703 loss incurred is 25% less than the profit earned on selling it at Rs. 836. What is the selling price of the article when it earns a profit of 20%?

16. Rahul went to purchase a Nokia mobile handset the shopkeeper told him to pay 20% tax if he asked the bill, Rahul managers to get the discount of 5% on the actual sale price of the mobile and he paid the shopkeeper Rs. 3325 without tax. Beside he manages to avoid to pay 20% tax on the already discounted price, what is the amount of discount that he has gotten?

17. A trader marks his goods such that he can make 32% profit after giving 12% discount. However a customer availed 20% discount instead of 12% what is the new profit percentage of trader?

18. The cost of servicing of a Maruti car at Maruti care Pvt. Ltd, is Rs. 400. Manager of service centre told me that for the second service within a year a customer can avail a 10% discount and further for third and fourth servicing he can avail 10% discount of the previous amount paid, within a year. Further if a customer gets more than 4 services within a year he has to pay just 60% of the servicing charges on these services. A customer availed 5 services from the same servicing station, what is the total percentage discount fetched by the customer?

19. Akram Miya has two types of grapes. One is the fresh grapes containing 80% water and dry grapes containing 25% water. He sells 20 kg dry grapes, by adding water to the dry grapes, at cost price. What is the total profit percentage when after adding water the weight of 20 kg dry grapes increased in the proportion of water in fresh grapes?

20. Jagran group launched a new magazine in January 2004. The group printed 10000 copies initially for Rs. 50000. It distributed 20% of its stock freely as specimen copy and 25% of the rest magazines are sold at 25% discount and rest at 16.66% discount whose printing price was Rs. 12 per copy. What is the overall gain or

loss in the first month's issue of magazine, if the magazine could not realize the income from advertisements or other resources?

-
21. Anupam sells a painting to Bhargava at $\frac{4}{5}$ th the rate of profit at which Bhargava sells it to Chaudhary. Further Chaudhary sells it to Dara Singh at half the rate of profit at which Anupam sold it to Bhargava. If Chaudhary earns a profit of 10% by selling it to Dara Singh for Rs. 2805. What is the cost price of painting for Bhargava?
-
22. A trader marks up his goods by 80% and gives discount of 25% besides it he weighs 10% less amount while selling his goods. What is the net profit of trader?
-

Exercise - 01

1. b	2. d	3. b	4. a	5. d	6. d	7. a	8. b	9. b	10. d
11. a	12. c	13. c	14. b	15. b	16. b	17. b	18. d	19. d	20. b
21. d	22. b	23. c	24. d	25. b	26. c	27. a	28. b	29. c	30. b

Exercise - 02

1. c	2. b	3. a	4. a	5. d	6. d	7. b	8. d	9. a	10. b
11. d	12. d	13. a	14. d	15. c	16. c	17. a	18. a	19. d	20. b
21. d	22. b	23. c	24. c	25. c	26. d	27. c	28. b	29. c	

Exercise - 03

1. a	2. b	3. c	4. c	5. c	6. c	7. b	8. c	9. d	10. c
11. d	12. c	13. b	14. b	15. a	16. c	17. b	18. a	19. d	20. a
21. c	22. c	23. c				24. b			

Exercise - 04

1. a	2. c	3. b	4. a	5. b	6. a	7. b	8. b	9. c	10. d
11. a	12. d	13. d	14. c	15. a	16. a	17. a	18. d	19. d	20. c
21. d	22. d	23. a				24. b			

Exercise - 05

TITA/Short Answer

1. 5.50	2. 20%	3. 3	4. No profit/ No loss	5. 228
6. 144%	7. Rs. 180 & Rs. 225	8. Rs. 900	9. Rs. 345	10. 12%
11. Rs. 2304	12. 21%	13. Rs. 200	14. 800	15. 912
16. 875	17. 20%	18. 19.42%	19. 275%	20. 56%
21. 2040		22. 50%		

Solutions:

Exercise - 01

1. Ans. (b)

Solution: The SP = 107.5% of the CP.
Thus, $CP = \frac{34.4}{1.05} = \text{Rs.32}$

2. Ans. (d)

Solution: A loss of 20% means a cost price of 100 corresponding to a selling price of 80. CP as a percentage of the SP would then be 125%

3. Ans. (b)

Solution: $CP = \frac{935}{1.1} = 850$.
Selling this at 810 would mean a loss of Rs.40 on a CP of Rs.850.

4. Ans. (a)

Solution: $CP = \frac{63}{1.05} = 60$.
Thus the required SP for 10% profit = $1.1 \times 60 = 66$.

5. Ans. (d)

Solution: $C.P \times 1.2 = 25 \rightarrow CP = 20.833$
At a selling price of Rs.22.5, the profit percent $\frac{1.666}{20.833} = 8\%$

6. Ans. (d)

Solution: The formula that satisfies this condition is Loss of $a^2/100\%$ (Where a is the common profit and loss percentage). Hence, in this case $400/100 = 4\%$ loss.

7. Ans. (a)

Solution: For Rs.72, we can buy a dozen pair of gloves, hence, for Rs.24 we can buy 4 pairs of gloves.

8. Ans. (b)

Solution: profit percentage = $\frac{150}{600} \times 100 = 36\%$

9. Ans. (b)

Solution: $CP = \frac{\text{Rs.1950}}{1.3} = \text{Rs.}1500$

10. Ans. (d)

Solution: Assume CP = Rs. X

$$X - 150 = \frac{x}{16} \quad \Rightarrow x = 160$$

11. Ans. (a)

Solution: Profit percentage = $\frac{5}{200} \times 100 = 25\%$

12. Ans. (c)

Solution: CP of 1 orange = Rs. $\frac{10}{200} = \text{Rs.} \frac{1}{16}$

So he should sell 16 oranges in a rupee to make a profit of 25%

13. Ans. (c)

Solution: CP of 1 book = Rs.15
SP of 1 book in order to gain 25% profit = Rs.18.75

$$\text{Required number of books} = \frac{225}{18.75} = 12$$

14. Ans. (b)

Solution: Method I

Let CP = Rs.1000/1000 g, so,

CP of 1 g = Rs.1

And CP of Ng = Rs. N

But SP of Ng = Rs.1000

$$\text{Profit \%} = \frac{1000-N}{N} \times 100$$

According to the question, profit \% = 100%

$$\therefore 100 = \frac{1000-N}{N} \times 100$$

Hence, $N=1000-N$, or $2N = 1000$ or $N=500$ g

15. Ans. (b)

Solution: MP of 1 pencil = Rs.1

For supplier, SP of 20 pencils = Rs.16

For retailer, SP of 20 pencils = Rs.20

$$\text{Profit percentage} = \frac{4}{16} \times 100 = 25\%$$

16. Ans. (b)

Solution: Let number of chips supplied = 100

For whole seller, Net CP =

$$(10000 \times 100 + 5 \times 10000) = \text{Rs.}1050000$$

$$\text{Profit} = \text{Rs.} \left(1050000 \times \frac{1}{5} \right) = \text{Rs.}210000$$

SP for whole seller = Rs.1260000

SP of 1 chip = Rs.12600

17. Ans. (b)

$$\text{Solution: } CP = \text{Rs.} \left(180 - 180 \cdot \frac{1}{6} \right) = \text{Rs.} 150$$

18. Ans. (d)

19. Ans. (d)

20. Ans. (b)

21. Ans. (d)

22. Ans. (b)

Solution: $\therefore 10\% x = 15\% \text{ of } y$,
Where $x+y = 30000$

$$\frac{x}{y} = \frac{3k}{2k}$$

Hence the difference = k = 6000

23. Ans. (c)

$$\begin{aligned} \text{Solution: SP of } 60\% \text{ good} &= 0.6x \times 0.95 = 0.57x \\ \text{SP of } 40\% \text{ goods} &= 0.4x \times 1.1 = 0.44x \quad \} \text{total} \\ \text{SP} &= 1.01x \end{aligned}$$

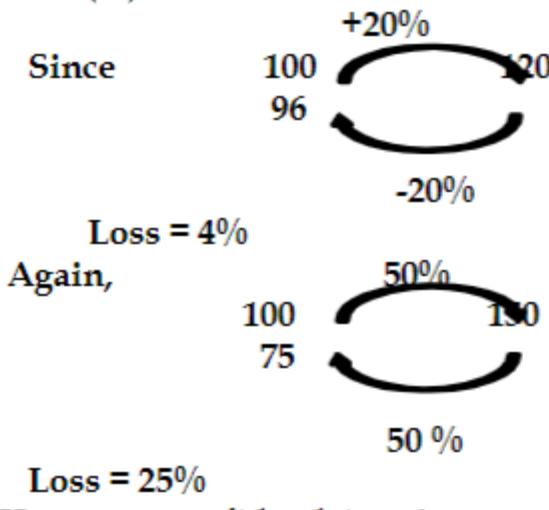
$$\begin{aligned} \text{Profit} &= 0.01x = 100 \\ x &= 10000 \end{aligned}$$

Alternative: from option (c)

$$\begin{array}{r} 10000 \\ 6000 \quad 4000 \\ \downarrow \quad \downarrow \\ \text{Lost} = 300 \quad \text{gain} = 400 \\ \text{Net gain} = 400 - 300 = \text{Rs. } 100, \\ \text{Hence, option (c) is correct.} \end{array}$$

24. Ans. (d)

Solution: It is dependent upon the markup (%) or discount (%)



Hence, we can't be determine.

25. Ans. (b)

Solution: Let the MP = Rs 1 per kg then

Weight	MP
Rate	
100	100
96	80
80	

1 SP

$$96$$

$$\text{Effective discount} = 1 = \frac{80}{96} = \frac{16}{96}$$

$$\% \text{ discount} = \frac{16}{96} \times 100 = 16.66\%$$

26. Ans. (c)

$$\text{Solution: Reduce price} = 100 \times 0.95 \times 0.90 \times 0.80 = 68.40$$

$$\text{Since discount} = (100 - 68.4)\% = 31.6\%$$

27. Ans. (a)

$$\text{Solution: Let the CP be Rs. } x, \text{ then SP be } 0.96x \\ 0.96x = 240 \rightarrow x = 250$$

$$\text{Now the news sp} = 250 \times 1.1 = 250$$

28. Ans. (b)

$$\text{Solution: CP} \xrightarrow[200]{(-10\%)} (\text{SP})_1 \xrightarrow[180]{(-5\%)} (\text{SP})_2 \xrightarrow[171]{} \dots$$

29. Ans. (c)

Solution:

$$\text{CP} = \frac{100}{6} = 16.66 \text{ paise}$$

$$\text{SP} = \frac{100}{5} = 20 \text{ paise}$$

$$\text{Profit (\%)} = \frac{20 - 16.66}{16.66} \times 100 = \frac{3.33}{16.66} \times 100 \\ = \frac{1}{5} \times 100 = 20\%$$

Hence, option (c) is correct.

$$\text{Alternatively: CP} = \frac{100}{6}$$

$$\text{SP} = \frac{100}{6} \times 1.2 = \frac{100}{5}$$

Hence, he should sell 5 toffees for Rs. 1 (=100 paise)

30. Ans. (b)

$$\text{Solution: } \frac{\text{CP}}{\text{SP}} = \frac{29x}{19x}$$

$$\text{Loss \%} = \frac{29x - 19x}{29x} \times 100 = 34.48\%$$

(to understand the concept assume CP of each article RS. 29 and SP of each article = 19)

Exercise – 02

1. Ans. (c)

Solution: The cost per toffee = $75/125 = \text{Rs. } 0.6 = 60 \text{ paise}$

Cost of 1 million toffees = 600000.

But there is a discount of 40 % offered on this quantity. Thus,

The total cost for 1 million toffees is 60% of 600000 = 360000.

2. Ans. (b)

Solution: Solve by trial and error using the options. If he marks his goods 30% above the cost price he

would be able to generate a 17% profit in spite of giving a 10% discount.

3. Ans. (a)

Solution: The labour price accounts for Rs.400. Since the profit percentage gives a 20% profit on this component i.e. Rs.80.

4. Ans. (a)

Solution: $\text{SP} = 960 = 0.96 \times \text{CP} \rightarrow 1000$.

To gain a profit of 16%

The marked price should be 116% of 1000 = 1160.

5. Ans. (d)

Solution: In the question A's investment has to be considered as Rs.10,000 (the house he puts up for sale).

He sells at 10.500 and buys back at Rs.9775.

Hence profit is Rs.1725.

$$\text{Required answer. } \frac{1725}{10000} \times 100 = 17.25$$

6. Ans. (d)

Solution: For 12 locks, he would have paid Rs.51. And sold them at Rs.57. This would mean a profit percentage of 11.76%

7. Ans. (b)

Solution: A 10% reduction in price increases the consumption by 11.11% but the increase in consumption is 6.2kg.

8. Ans. (d)

Solution: A gross means 144 eggs. Thus, the cost price per egg = 25 paise and the selling price after a 12.5% profit = 28 paise approx.

9. Ans. (a)

Solution: 300 (A buys at this value) \rightarrow 345 (sells it to B at a profit of 15%) \rightarrow 404 (B sells it back to A at a profit of 20% gaining Rs.69 in the process). Thus, A's original cost = Rs.300.

10. Ans. (b)

Solution: The CP of the TV \rightarrow $CP_{TV} \times 0.8 = 12000 \rightarrow CP_{TV} = 15000$.

The CP of the VCP \rightarrow $CP_{VCP} \times 1.2 = 12000 \rightarrow CP_{VCP} = 10000$.

Total sales value = $12000 \times 2 = 24000$

Total cost price = $15000 + 10000 = 25000$,

Loss = $25000 - 24000 = 1000$.

11. Ans. (d)

Solution: Let the cost price be $P \times 0.95 \times 1.2 = P \times 1.1 + 7 \rightarrow P = 400$. Alternately you could have solved this using options.

12. Ans. (d)

Solution: CP of 1 apple = Rs.1

CP or 12 apples = Rs.12,

SP of 9 apple = Rs.12

$$\text{Required difference} = \frac{3}{9} \times 100 = 33\frac{1}{3}\%$$

13. Ans. (a)

Solution: let SP of 1 kg article = Rs.100

For 1st shopkeeper

SP of 1 kg article = Rs.75

For 2nd shopkeeper

SP of 1.25 kg article = Rs.100

SP of 1kg article = Rs.80

14. Ans. (d)

Solution: In the whole question, there is nowhere the mention of any rupees figures. Since amount is not given, we cannot calculate any value (in Rs.).

15. Ans. (c)

Solution: Let CP Rs.700

X = Rs.90

L = 10%

Y = Rs.110

P = 10%

Putting these values, we get (c) as the answer.

16. Ans. (c)

Solution: Let MP = Rs.100 and CP = Rs. X

Then, $450 - 5x = 700 - 8x$

$$X = \frac{250}{3}$$

$$\text{Required ratio} = \frac{100}{\frac{250}{3}} = 6:3$$

17. Ans. (a)

Solution: $13x + 9(50-x) = 550$

$$4x = 100$$

$$X = 25$$

18. Ans. (a)

Solution: CP of 100 m = Rs.100

$$\text{CP of } \frac{500}{6} \text{ m} = \text{Rs. } \frac{500}{6}$$

$$\text{Profit Percentage} = \frac{\frac{100 - \frac{500}{6}}{\frac{500}{6}}}{\frac{500}{6}} \times 100 = 20\%$$

Alternatively, profit is 16.66% be selling 83.33% quantity.

19. Ans. (d)

Solution: $(7.50 \times 2x) - (7x + 6x) = 80$

$$2x = 80$$

$$X = 40$$

20. Ans. (b)

21. Ans. (d)

22. Ans. (b)

23. Ans. (c)

24. Ans. (c)

Solution: Let the cost price of one gram be Re. 1 then the markup price be Rs. 1.2 per kg

Now he sells 100 g which seems to be 1250 g so he charges to customer $1250 \times 1.2 = 1500$ for 100 g (or Rs. 1000)

$$\text{Thus his profit \%} = \frac{1500 - 1000}{1000} \times 100 = 50\%$$

25. Ans. (c)

$$\text{Solution: Loss \%} = \left(\frac{\text{common gain or loss}}{10} \right) \times 100 \\ = \left(\frac{20}{10} \right) \times 100 = 4\%$$

26. Ans. (d)

$$\text{Solution: } \frac{CP}{SP} = \frac{13}{23} \\ \text{Profit (\%)} = \frac{23 - 13}{13} \times 100 = \frac{10}{13} \times 100 = 76.92\%$$

27. Ans. (c)

Solution: Go through options:
 $100 \xrightarrow{80\%} 180$

$$\text{New SP} = \frac{180}{3} = 60$$

Percentage loss = 40% (100 - 60)

Hence, (c) is correct choice.

28. Ans. (b)

Solution: total cost of 4 cars = 1 + 2 = 3 lakh

$$\text{Total SP of 4 cars} = 3 \times 1.5 = 4.5 \text{ lakh}$$

$$\text{SP of 1 car} = 1.2 \text{ lakh}$$

$$\text{SP of rest 3 cars} = 4.5 - 1.2 = 3.3 \text{ lakh}$$

$$\text{Average SP of all the 3 cars} = 1.1 \text{ lakh}$$

29. Ans. (c)

Solution: let the number of diaries (produced) be 100 and the cost price of a diary be Re 1 then

$$\text{Total cost incurred} = 100 \times 1 = 100$$

$$\text{Total sale price} = 32 \times .75 + 60 \times 1.4 = 108$$

$$\text{Therefore profit} = \text{Rs. 8}$$

Thus there is 8 % profit.

Exercise - 03

1. Ans. (a)

Solution: From the last statement we have: Charan's cost price = $1188/1.1 = 1080$ = Bhushan's selling price. Then,

Bhushan's CP would be given by the equation: $CP \times 0.9 = 1080 \rightarrow CP \text{ for Bhushan} = 1200 = \text{SP for Ashok}$. Also, Ashok gains 20% Hence, CP for Ashok $\rightarrow CP \times 1.2 = 1200 \rightarrow CP \text{ for Ashok} = 1000$.

This includes a Rs.110 Component of repairs. Thus the purchase price for Ashok would be $1000 - 110 = 890$.

2. Ans. (b)

Solution: Assume marked price for both to be 100.

$$X's \text{ selling price} = 100 \times 0.75 \times 0.95 = 71.25$$

$$Y's \text{ selling price} = 100 \times 0.84 \times 0.88 = 73.92$$

Buying from 'X' is more profitable.

3. Ans. (c)

Solution: The total discount offered by A = 8% on 20000 + 5% on 16000 = $1600 + 800 = 2400$.

If B wants to be as competitive, he should also offer a discount of Rs.2400 on 3600. Discount percentage = $2400 \times 100/36000 = 6.66\%$ discount.

4. Ans. (c)

Solution: For a cost price of Rs.400 he needs a selling price of 480 for a 20% profit. This selling price is arrived at after a discount of 4% on the marked price. Hence, the marked price MP = $480/0.96 = 500$

5. Ans. (c)

Solution: If the cost price is 100, a mark up of 80% means a marked price of 180. Further a 15% discount on the marked price would be given by:
 $180 - 15\% \text{ of } 180 = 180 - 27 = 153$.

Thus the percentage profit is 53%

6. Ans. (c)

Solution: Cost per 100 apples = $60 + 15\% \text{ of } 60 = \text{Rs.69}$.

$$\text{Selling price @20\% profit} = 1.2 \times 69 = \text{Rs.82.8}$$

7. Ans. (b)

Solution: The buying price is Rs.9 per dozen, while the sales prices iRs.12 per dozen - a profit of 33.33%

8. Ans. (c)

Solution: Net CP = Rs.50x

$$\text{Net SP} = \text{Rs.48x}$$

$$\text{Loss percentage} = \frac{2x}{50x} \times 100 = 4\%$$

9. Ans. (d)

Solution: Let CP = Rs.100

$$MP = \text{Rs.140}$$

$$\text{Profit, when discount is 5\%} = \text{Rs.33}$$

$$\text{Profit, when discount is 10\%} = \text{Rs.26}$$

$$\text{Hence, } CP = \frac{100}{7} \times 14 = \text{Rs.200}$$

$$MP = \text{Rs.280}$$

$$SP = \text{Rs.224}$$

10. Ans. (c)

Solution: 15% of CP = Rs.56.25,
Hence, CP = Rs.375

$$\text{New SP} = \text{Rs.450},$$

$$\text{Hence, Profit} = \text{Rs.75}$$

$$\text{Profit Percentage} = 20\%$$

11. Ans. (d)

Solution: $x = \frac{24-x}{x} \times 100$,

So, $X = 20$

12. Ans. (c)

Solution: Price = Rs. X

$$SP = Rs. 1.1x - 0.5x + 15, \text{ So, } 0.6x = 15$$

$$So, x = 25$$

Alternatively we can do this question very easily by using options.

13. Ans. (b)

Solution: $9(x-y) = 72$,

$$x-y = 8$$

Therefore only possibility is 19 or 91.

14. Ans. (b)

15. Ans. (a)

16. Ans. (c)

17. Ans. (b)

Solution: Amount purchase = 1100g

Amount sold = 900g

$$\text{Profit \%} = \frac{200}{900} \times 100 = 22\frac{2}{9}\%$$

18. Ans. (a)

Solution: Reduction in price increase in amount

$$20\% \left(\frac{1}{5}\right) \downarrow$$

$$\frac{1}{4} \uparrow$$

$$(25\%) = 6\text{kg}$$

It means original amount of sugar needed = $6 \times 4 = 24\text{ kg.}$

19. Ans. (d)

Solution: Line pens

CP: SP

$$37 : 50$$

Cello pens

CP: SP

$$37 : 24$$

$$\text{Profit \%} = \frac{13}{37} \times 100$$

and

$$\text{Loss \%} = \frac{13}{37} \times 100$$

Since Profit = loss

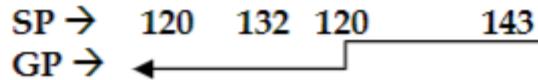
Hence option (d) is correct.

20. Ans. (a)

Solution:

M

$$CP \rightarrow 100 \quad 120 \quad 132 \quad (120+12) = 132$$



$$\text{Loss A} = 143 - 120 = 23$$

$$\% \text{ loss of A} = \frac{23}{100} \times 100 = 23\%$$

21. Ans. (c)

Solution: If had Rs. 100

Discount = 25 = cost of my sister's watch then cost of my own watch = 75

Thus the ratio of cost of my own watch to that of my sister's watch = 3 : 1

22. Ans. (c)

Solution: Profit % = $\frac{25}{100} = \frac{120+k}{880}$ (profit) $\rightarrow k=100$

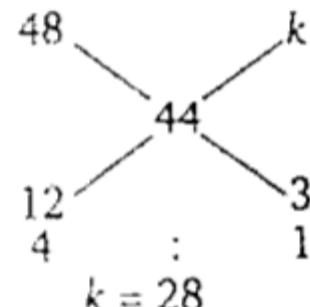
Sale

$$\text{Therefore, net profit \%} = \frac{100}{1000} \times 100 = 10\%$$

23. Ans. (c)

Solution: $SP = \frac{12}{11} \text{ of } CP$
 $CP = 44$

Now, by alligation



Thus the price of speed brand is Rs. 28/litre.

24. Ans. (b)

Solution:

	A	B	C
Investment	$3x$	$4x$	$5x$
Rate of return	$6y\%$	$5y\%$	$4y\%$
Return	$\frac{18xy}{100}$	$\frac{20xy}{100}$	$\frac{20xy}{100}$

$$\text{Total} = (18+20+20) = \frac{58xy}{100}$$

$$\text{B's earnings} = \text{A's earnings} = \frac{2xy}{100} = 250$$

$$\text{Total earning} = \frac{58xy}{100} = 7250$$

Exercise - 04

1. Ans. (a)

Solution: Original cost price = Rs.5000.

New cost price = $1.3 \times 5000 = \text{Rs.}6900$

Profit percentage = $(400/6500) \times 100 = 6/(2/13)\%$

2. Ans. (c)

Solution: If you assume the cost price to be 100 and we check from the options, we will see that for option (c) the marked price will be 120 and giving a discount of 12.5% would leave the shopkeeper with a 5% profit.

3. Ans. (b)

Solution: The percentage profit = $\frac{\text{Goods left}}{\text{Goods sold}} \times 100$
 $= 10/40 \times 100 = 25\%$

4. Ans. (a)

Solution: $230/200 = 1.15 \rightarrow$ The profit percentage would be 15% if sold at 230. Thus, the increase in profit percent = $15-10 = 5\%$

5. Ans. (b)

Solution: Total cost (assume) = 100.

Recovered amount = $65 + 0.85 \times 32.5 + 0.7 \times 32.5$
 $= 65+27.625+22.75 = 115.375$

Hence, profit percent = 15.373%

6. Ans. (a)

Solution: Assume he bought 20 apples each. Net investment = $\text{Rs.}5 + \text{Rs.}4 = \text{Rs.}9$ for 40 apples. He would sell 40 apples @ $(40 \times 2)/9 = \text{Rs.}8.888 \rightarrow$ Loss of $\text{Rs.}0.111$ on $\text{Rs.}9$ investment
Loss percentage = 1.23%

7. Ans. (b)

Solution: The problem is structured in such a way that you should be able to interpret that if he had sold 120 kg of rice he would recover the investment on 100 kg of rice.

% Loss/profit = $\frac{\text{Goods left}}{\text{Goods sold}} \times 100$
 $(-20/120) \times 100 = 16.66\%$ loss.

Since cost price for Deb is $\text{Rs.}11$. Selling price per kg would be $\text{Rs.}9.166$

8. Ans. (b)

Solution: The first one would get a profit of $\text{Rs.}500$ because his cost wold be 2500 for him to get a 20% profit on cost price by selling at 3000.

The second one would earn a profit of 600 (20% of 3000).

Difference in profits = $\text{Rs.}100$

9. Ans. (c)

Solution: Profit in original situation = 20%

In new situation, the purchase price of 90 (buys at 10 less) would give a selling price of 132 (sells at 10% above 120).

The new profit percent = $[(132-90) \times 100]/90 = 46.66$

Change new profit percent = $[(46.66-20) \times 100]/20 = 133.33\%$

10. Ans. (d)

Solution: The successive discounts must have been of 10% each. The required price will be got by reducing 25 by 10% twice consecutively. (use PCG application for successive change)

11. Ans. (a)

Solution: If we assume the value of the first cycle as $\text{Rs.}900$.

Then $900+96 = 996$ should be equal to twice the value of the second cycle. Hence, the value of the second cycle works out to be 498.

Also $498+96 = 594$ which is $\text{Rs.}306$ less than 900.

Hence, option (a) fits the situation perfectly and will be the correct answer.

Note here that if you had tried to solve this through equation. You would have got stuck for a very long time.

12. Ans. (d)

Solution: While purchasing he would take 1200 grams for the price of 1000 grams.

While selling he would sell 900 grams for the price of 1000 grams. Since $CP = SP$, the profit earned is through the weight manipulations. It will be given by goods left / goods sold = $300 \times 100/900 = 33.33\%$

13. Ans. (d)

Solution: After 2 years the flat would be worth $\text{Rs.}288000$ while the land would be worth $\text{Rs.}266200$.

The profit percentage of the gainer would be given by:

$$(21800/266200) \times 100 = 8.189\%$$

Hence (d).

14. Ans. (c)

Solution: The cost of the trip would be proportional to the price of petrol. So, if initially the cost is 100, the new cost would be 80. Also, initially since his profit is 20% his revenue would be 120. When he takes 4 passengers instead of 3 his revenue would go up to 160 - and his profit would become 100% (cost 80 and revenue 160).

15. Ans. (a)

Solution: He would be selling 800 grams for $\text{Rs.}12$. Since a kg cost $\text{Rs.}10$ 800 grams would cost $\text{Rs.}8$.

16. Ans. (a)

Solution: C's purchase price = $2145 \times 10/11 = 1950$
 B's rate of profit is 3 times C's rate of profit hence, B sells to C at 30% profit
 B's price + 30% profit = 1950 (C's price).
 Hence, B's price = 1500.
 Further, since A's profit rate is $5/3$ rd the rate of profit of B, A's profit percent would be $30 \times 5/3 = 50\%$
 Thus, A's price + 50 % profit = 1500 (B's price)
 Thus, A's price = 1000

17. Ans. (a)

Solution: There were 5 printers (2+3) and 20 monitors. He sells 2 printers for a profit of Rs.2000 each. Hence, profit from printer sales = Rs.4000.

18. Ans. (d)

Solution: By charging Rs.1.2 more his profit should double to 40% this means that his profit of 40% should be equal to Rs.2.4,
 Thus his cost price must be Rs.6 and his original selling price should be 7.2 Hence, option (d) is correct

19. Ans. (d) Solution: Self Explanatory

20. Ans. (c)

21. Ans. (d)

22. Ans. (d)

Solution: Price of 10 chairs = $10 \times 200 = 2000$
 Price of 12 chairs (without discount) = $12 \times 200 = 2400$
 Price of 12 chairs with discount = $10 \times 200 + 2x 80 = 2160$
 Therefore discount = $2400 - 2160 = 240$
 Hence, discount % = $\frac{240}{2400} \times 100 = 10\%$

Exercise - 05

TITA/SA

1. Ans. Rs. 5.50

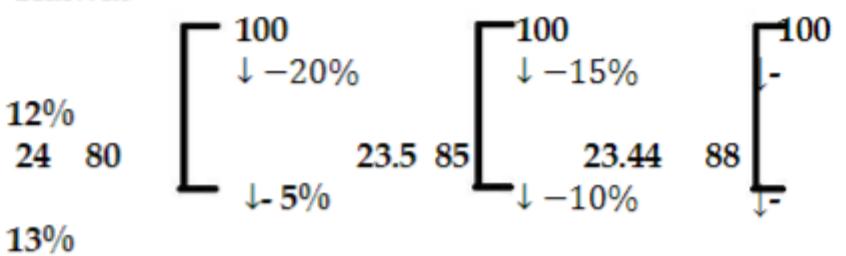
Solution: In order to solve this problem, first assume that the cost of manufacturing 1 article is Rs.1 then 100 articles would get manufactured for Rs.100. For a 20% profit on this cost, he should be able to sell the entire stock of Rs.120. However since he would be able to sell only 88 articles (given that 12% of his manufactured articles would be rejected) he needs to recover Rs.120 from selling 88 articles only. Thus, the profit he would need would be given by the ratio 32/88.

Now it is given to use that his selling price is Rs.7.5. the same ratio of profitability i.e. 32/88 is achieved if his cost per article is Rs.5.5.

23. Ans. (a)

Solution: Anjuli

Chawla



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

Note: it does not matter that we first decrease by 20% and then by 5% of vice-versa. This concept has been already illustrated in percentage chapter. Try to do it for your concept clarification.

24. Ans. (b)

Solution: Candle

Bulb

CP	a	c
SP	b	d

And $c=2a$

$$\text{Profit} = 10(b-a) = 3d$$

$$\text{Loss} = 10(c-d) = 4b$$

$$\text{Profit} (\%) = \frac{3d}{10a} \times 100$$

$$\text{And Loss} (\%) = \frac{4b}{10c} \times 100$$

$$\text{Again } \frac{3d}{10a} \times 100 = \frac{4b}{10c} \times 100$$

$$= \frac{3d}{a} = \frac{4b}{c} \rightarrow \frac{3d}{a} = \frac{4b}{2a} \quad (\because c=2a)$$

$$\frac{b}{d} = \frac{3}{2}$$

Exercise - 05

TITA/SA

2. Ans. 20%

Solution: If you assume that his cost price is 1 Re per gram, his cost for 1000 grams would be Rs.1000. For supposed 1 kg sale he would charge a price of 1080 after an increase of 20% followed by a decrease of 10% but since he gives away only 900 grams the cost for him would be Rs.900.

Thus he is buying at 900 and selling at 1080 a profit percentage of 20%

3. Ans. 3

Solution: Assume that for 100 items the cost price is Rs.100. Then the selling price is Rs.130. Since 24 is sold at half the price, he would recover $24 \times \frac{1}{2} =$ Rs.12 (since it is sold at half the cost price)

The remaining 70 would be sold at $70 \times 1.3 = \text{Rs.}91$.
 Total revenue = $91 + 12 = 103 \rightarrow$ a profit of 3 on a cost of 100

4. Ans. No profit/ no loss
 Solution: No Explanation

5. Ans. 228
 Solution: List price = 228

$$\begin{aligned}\text{CP (before duty)} &= \text{Rs.}152 \\ \text{CP (after duty)} &= \text{Rs.}152 \times 1.2 = \text{Rs.}182.4 \\ \text{SP} &= \text{Rs.}152 \times 1.2 \times 1.25 = \text{Rs.}228\end{aligned}$$

6. Ans. 144%
 Solution: Cost = Rs.2400
 Published Price Rs.3.25
 $\text{SP} = 75/100 \times 3.25 = \text{Rs.}2.4375$
 Number of Free copy = $(3000 / 25) = 120 + 500 = 620$
 So, Total SP = $2380 \times \text{Rs.}2.4375 = \text{Rs.}5801.25$
 Hence, percentage gain = $5801.25 - 2400 / 2400 \times 100 = 144\%$

7. Ans. (Rs. 180 and Rs. 225)

8. Ans. (Rs. 9000)

9. Ans. (Rs. 345)

10. Ans. 12%

Solution:
 Initially : $100 \quad \text{CP} \quad \text{SP} \quad \text{MP}$
 profit 40% $x(\text{since})$
 New prices : $100 \quad 112 \quad 140$
 $\downarrow \quad \quad \quad \downarrow$
 Profit = 12% discount = 20%

11. Ans. Rs. 2304

Solution:
 $100 \quad \text{CP} \quad 120 \quad \text{SP} \quad 150 \quad \text{MP}$
 $\downarrow \quad \quad \quad \quad \quad \quad \downarrow$
 Profit = 20% discount = 20%

12. Ans. 21%

Solution: CP of A+B+C = $2x \times y + 5x \times 2y + 2x \times 4y = 20xy$

$$\begin{aligned}\text{Profit of A} &= 0.2xy \\ \text{Profit of B} &= 2xy \\ \text{Profit of C} &= 2xy \\ \text{Total profit} &= 4.2xy \\ \% \text{ profit} &= \frac{4.2xy}{20xy} \times 100 = 21\%\end{aligned}$$

13. Ans. Rs. 200

Solution:

$$\begin{array}{ccc} \text{CP} & \text{SP} & \text{MP} \\ x & 112.5x = 225 & 300 \\ & & \curvearrowleft (-25\%) \end{array}$$

X = 200 hence the cost price be Rs. 200.

Note: It can also be solved by using option, first of all find the SP by decreasing MP by 25% then this SP will be equal to 112.5% (12.5% is the profit) of the cost price so the CP can be find as given above.

14. Ans. 800

$$\text{Solution: } \left[(x \times 1.1) \times 1.1 \right] \times \frac{1125}{1100} = 990$$

$$X = 800$$

Alternatively : go through options or by the reverse process.

15. Ans. 912

$$\begin{aligned}\text{Solution: } \text{CP} + 4k &= \text{SP}_1 \quad (\text{gives profit}) \\ \text{CP} - 3k &= \text{SP}_2 \quad (\text{gives loss}) \\ \text{Since loss (3k) is } 25\% \text{ less than profit (4k)} \\ \text{SP}_1 - \text{SP}_2 &= 7k = 836 - 703 = 133 \\ k &= 19 \\ \text{CP} &= \text{SP}_1 - 4k = \text{SP}_2 + 3k = 760 \\ \text{Therefore required SP} &= 760 \times 1.2 = 912\end{aligned}$$

16. Ans. 875

Solution: CP = 100, SP (with tax) = 120
 New SP = $100 - 5 = 95$
 Effective discount = $120 - 95 = 25$
 So, as SP of 95 \rightarrow discount = 25
 And at SP of 3325 \rightarrow discount = $\frac{25}{95} \times 3325 = 875$

17. Ans. 20%

Solution:
 $100 \quad \text{CP} \quad \text{SP} \quad \frac{12}{88} \uparrow \quad \text{MP}$
 $132 \quad \quad \quad \quad \quad \quad 150$
 [from percentage change graphic]
 $-12\% \left(=\frac{12}{100}\right) \downarrow$

Note: in this case first of all find the SP, after adding profit percentage to CP then find the MP through SP.

Now,
 $100 \quad \text{CP} \quad 20\% \quad \text{SP} \quad \text{MP}$
 $132 \quad \quad \quad \quad \quad \quad 150$
 $-20\% \quad \quad \quad \quad \quad \quad$

Here first of all we subtract discount from the MP then the resultant value will be SP.

18. Ans. 19.42%

Solution: amount paid in 1st service = 100 (suppose)
 Amount paid in IIInd service = 90
 Amount paid in IIIrd service = 81

Amount paid in IVth service = 72.9

Amount paid in Vth service = 60

Total amount paid $\frac{403.9}{403.9}$

Discount = $500 - 403.9 = 96.1$

Discount % = $\frac{96.1}{500} \times 100 = 19.42\%$

19. Ans. 275%

Solution: Fresh Grapes

Water	Pulp
80%	20%
4	1
Dry Grapes	
Water	Pulp
25%	75%
1	3
5kg	15 kg } out of 20 kg dry
grapes	
80%	20%
55kg	4
60kg	15 kg

Thus to make dry grapes similar to the fresh grapes,
Akram requires 55kg water with 20kg of dry grapes.

So, the profit (%) = $\frac{55}{20} \times 100 = 275\%$

20. Ans. 56%

Solution: Total cost = Rs. 50,000

Total sale price (or revenue) = $2000 \times 9 + 600x$

$100 = 78000$

Profit (%) = $\frac{28000}{50000} \times 100 = 56\%$

21. Ans. 2040

Solution: Chaudhary's profit = 10%

Anupam's profit = 20%

Bhargav's profit = 25%

i.e. A 20% B 25% C 10% D

100 120 150 165

Now

B

D

120

165

17 times

2040

2805

17 times } 17 times }

2040 2805

17 times }

2040 2805