11. PROFIT AND LOSS

IMPORTANT FACTS

Cost Price : The price at which an article is purchased, is called its *cost price*, abbreviated as *C.P.*

Selling Price : The price at which an article is sold, is called its *selling price*, abbreviated as *S.P.*

Profit or Gain : If S.P. is greater than C.P., the seller is said to have a *profit* or *gain*.

Loss : If S.P. is less than C.P., the seller is said to have incurred a *loss*.

FORMULAE

1. Gain = (S.P.) − (C.P.)

2. Loss = (C.P.) − (S.P.)

3. Loss or gain is always reckoned on C.P.

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

5. $\text{Loss}\% = \left(\dfrac{\text{Loss} \times 100}{\text{C.P.}} \right)$

6. $\text{S.P.} = \dfrac{(100 + \text{Gain}\%)}{100} \times \text{C.P.}$

7. $\text{S.P.} = \dfrac{(100 - \text{Loss}\%)}{100} \times \text{C.P.}$

8. $\text{C.P.} = \dfrac{100}{(100 + \text{Gain}\%)} \times \text{S.P.}$

9. $\text{C.P.} = \dfrac{100}{(100 - \text{Loss}\%)} \times \text{S.P.}$

10. If an article is sold at a gain of say, 35%, then S.P. = 135% of C.P.

11. If an article is sold at a loss of say, 35%, then S.P. = 65% of C.P.

12. When a person sells two similar items, one at a gain of say, *x*%, and the other at a loss of *x*%, then the seller always incurs a loss given by :

$$\text{Loss}\% = \left(\frac{\text{Common Loss and Gain}\%}{10} \right)^2 = \left(\frac{x}{10} \right)^2$$

13. If a trader professes to sell his goods at cost price, but uses false weights, then

$$\text{Gain}\% = \left[\frac{\text{Error}}{(\text{True Value}) - (\text{Error})} \times 100 \right]\%.$$

SOLVED EXAMPLES

Ex. 1. *A man buys an article for Rs. 27.50 and sells it for Rs. 28.60. Find his gain percent.*

Sol. C.P. = Rs. 27.50, S.P. = Rs. 28.60.

So, Gain = Rs. (28.60 − 27.50) = Rs. 1.10.

∴ $\text{Gain}\% = \left(\dfrac{1.10}{27.50} \times 100 \right)\% = 4\%.$

Ex. 2. *If a radio is purchased for Rs. 490 and sold for Rs. 465.50, find the loss percent.*

Sol.   C.P. = Rs. 490, S.P. = Rs. 465.50.

   Loss = Rs. (490 − 465.50) = Rs. 24.50.

∴   Loss% = $\left(\dfrac{24.50}{490} \times 100\right)$ % = 5%.

Ex. 3. *Find S.P., when*

(i) *C.P. = Rs. 56.25, Gain = 20%*   (ii) *C.P. = Rs. 80.40, Loss = 5%*

Sol.   (i) S.P. = 120% of Rs. 56.25 = Rs. $\left(\dfrac{120}{100} \times 56.25\right)$ = Rs. 67.50.

      (ii) S.P. = 85% of Rs. 80.40 = Rs. $\left(\dfrac{85}{100} \times 80.40\right)$ = Rs. 68.34.

Ex. 4. *Find C.P., when*

(i) *S.P. = Rs. 40.60, Gain = 16%*   (ii) *S.P. = Rs. 51.70, Loss = 12%*

Sol.   (i) C.P. = Rs. $\left(\dfrac{100}{116} \times 40.60\right)$ = Rs. 35.

      (ii) C.P. = Rs. $\left(\dfrac{100}{88} \times 51.70\right)$ = Rs. 58.75.

Ex. 5. *A person incurs 5% loss by selling a watch for Rs. 1140. At what price should the watch be sold to earn 5% profit ?*   (R.R.B. 2002)

Sol.   Let the new S.P. be Rs. x. Then,

   (100 − loss%) : (1st S.P.) = (100 + gain%) : (2nd S.P.)

⇒ $\left(\dfrac{100-5}{1140}\right) = \left(\dfrac{100+5}{x}\right)$ ⇒ $x = \left(\dfrac{105 \times 1140}{95}\right) = 1260.$

∴   New S.P. = Rs. 1260.

Ex. 6. *A book was sold for Rs. 27.50 with a profit of 10%. If it were sold for Rs. 25.75, then what would have been the percentage of profit or loss ?*

(Hotel Management, 2003)

Sol.   S.P. = Rs. 27.50, Profit = 10%.

   So, C.P. = Rs. $\left(\dfrac{100}{110} \times 27.50\right)$ = Rs. 25.

   When S.P. = Rs. 25.75, profit = Rs. (25.75 − 25) = Re. 0.75.

∴   Profit% = $\left(\dfrac{0.75}{25} \times 100\right)$% = 3%.

Ex. 7. *If the cost price is 96% of the selling price, then what is the profit percent?*

Sol.   Let S.P. = Rs. 100. Then, C.P. = Rs. 96; Profit = Rs. 4.

∴   Profit% = $\left(\dfrac{4}{96} \times 100\right)$% = $\dfrac{25}{6}$% = 4.17%.

Ex. 8. *The C.P. of 21 articles is equal to S.P. of 18 articles. Find the gain or loss percent.*

Sol.   Let C.P. of each article be Re. 1.

   Then, C.P. of 18 articles = Rs. 18, S.P. of 18 articles = Rs. 21.

∴   Gain% = $\left(\dfrac{3}{18} \times 100\right)$% = $16\dfrac{2}{3}$%.

Ex. 9. *By selling 33 metres of cloth, one gains the selling price of 11 metres. Find the gain percent.* (Section Officers', 2001)

Sol. (S.P. of 33 m) – (C.P. of 33 m) = Gain = S.P. of 11 m.

∴ S.P. of 22 m = C.P. of 33 m.

Let C.P. of each metre be Re. 1. Then, C.P. of 22 m = Rs. 22, S.P. of 22 m = Rs. 33.

∴ Gain % = $\left(\frac{11}{22} \times 100\right)\% = 50\%$.

Ex. 10. *A vendor bought bananas at 6 for Rs. 10 and sold them at 4 for Rs. 6. Find his gain or loss percent.*

Sol. Suppose, number of bananas bought = L.C.M. of 6 and 4 = 12.

∴ C.P. = Rs. $\left(\frac{10}{6} \times 12\right)$ = Rs. 20; S.P. = Rs. $\left(\frac{6}{4} \times 12\right)$ = Rs. 18.

∴ Loss % = $\left(\frac{2}{20} \times 100\right)\% = 10\%$.

Ex. 11. *A man bought toffees at 3 for a rupee. How many for a rupee must he sell to gain 50% ?*

Sol. C.P. of 3 toffees = Re. 1; S.P. of 3 toffees = 150% of Re. 1 = $\frac{3}{2}$.

For Rs. $\frac{3}{2}$, toffees sold = 3. For Re. 1, toffees sold = $\left(3 \times \frac{2}{3}\right) = 2$.

Ex. 12. *A grocer purchased 80 kg of sugar at Rs. 13.50 per kg and mixed it with 120 kg sugar at Rs. 16 per kg. At what rate should he sell the mixture to gain 16% ?*

Sol. C.P. of 200 kg of mixture = Rs. (80 × 13.50 + 120 × 16) = Rs. 3000.

S.P. = 116% of Rs. 3000 = Rs. $\left(\frac{116}{100} \times 3000\right)$ = Rs. 3480.

∴ Rate of S.P. of the mixture = Rs. $\left(\frac{3480}{200}\right)$ per kg = Rs. 17.40 per kg.

Ex. 13. *Pure ghee costs Rs. 100 per kg. After adulterating it with vegetable oil costing Rs. 50 per kg, a shopkeeper sells the mixture at the rate of Rs. 96 per kg, thereby making a profit of 20%. In what ratio does he mix the two ?*

Sol. Mean cost price = Rs. $\left(\frac{100}{120} \times 96\right)$ = Rs. 80 per kg.

By the rule of alligation :

C.P. of 1 kg ghee   C.P. of 1 kg oil
100   50

Mean price
80
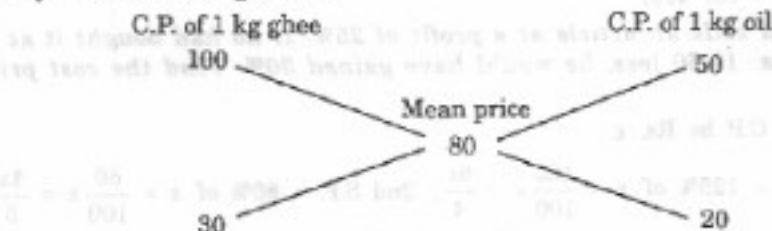
30   20

∴ Required ratio = 30 : 20 = 3 : 2.

Ex. 14. *A dishonest dealer professes to sell his goods at cost price but uses a weight of 960 gms for a kg. weight. Find his gain percent.*

Sol. Gain % = $\left[\frac{\text{Error}}{(\text{True Value}) - (\text{Error})} \times 100\right]\% = \left(\frac{40}{960} \times 100\right)\% = 4\frac{1}{6}\%$.

Ex. 15. *If the manufacturer gains 10%, the wholesale dealer 15% and the retailer 25%, then find the cost of production of a table, the retail price of which is Rs. 1265?*

Sol. Let the cost of production of the table be Rs. x.

Then, 125% of 115% of 110% of x = 1265

$$\Rightarrow \quad \frac{125}{100} \times \frac{115}{100} \times \frac{110}{100} \times x = 1265 \quad \Rightarrow \quad \frac{253}{160} x = 1265 \quad \Rightarrow \quad x = \left(\frac{1265 \times 160}{253}\right) = \text{Rs. } 800.$$

Ex. 16. *Monika purchased a pressure cooker at $\frac{9}{10}$ th of its selling price and sold it at 8% more than its S.P. Find her gain percent.*

Sol. Let the S.P. be Rs. x. Then, C.P. = Rs. $\frac{9x}{10}$, Receipt = 108% of Rs. x = Rs. $\frac{27x}{25}$.

$$\text{Gain} = \text{Rs. } \left(\frac{27x}{25} - \frac{9x}{10}\right) = \text{Rs. } \left(\frac{108x - 90x}{100}\right) = \text{Rs. } \frac{18x}{100}.$$

$$\therefore \quad \text{Gain\%} = \left(\frac{18x}{100} \times \frac{10}{9x} \times 100\right)\% = 20\%.$$

Ex. 17. *An article is sold at a certain price. By selling it at $\frac{2}{3}$ of that price one loses 10%. Find the gain percent at original price.*

Sol. Let the original S.P. be Rs. x. Then, New S.P. = Rs. $\frac{2}{3}x$, Loss = 10%.

$$\text{So, C.P.} = \text{Rs. } \left(\frac{100}{90} \times \frac{2}{3}x\right) = \frac{20x}{27}.$$

Now, C.P. = Rs. $\frac{20x}{27}$, S.P. = Rs. x. Gain = Rs. $\left(x - \frac{20x}{27}\right)$ = Rs. $\frac{7x}{27}$.

$$\therefore \quad \text{Gain\%} = \left(\frac{7x}{27} \times \frac{27}{20x} \times 100\right)\% = 35\%.$$

Ex. 18. *A tradesman sold an article at a loss of 20%. If the selling price had been increased by Rs. 100, there would have been a gain of 5%. What was the cost price of the article?*

(S.S.C. 2004)

Sol. Let C.P. be Rs. x. Then, (105% of x) − (80% of x) = 100 or 25% of x = 100

$$\therefore \quad \frac{x}{4} = 100 \text{ or } x = 400.$$

So, C.P. = Rs. 400.

Ex. 19. *A man sells an article at a profit of 25%. If he had bought it at 20% less and sold it for Rs. 10.50 less, he would have gained 30%. Find the cost price of the article.*

Sol. Let the C.P. be Rs. x.

1st S.P. = 125% of $x = \frac{125}{100}x = \frac{5x}{4}$; 2nd S.P. = 80% of $x = \frac{80}{100}x = \frac{4x}{5}$.

2nd S.P. = 130% of $\frac{4x}{5} = \left(\frac{130}{100} \times \frac{4x}{5}\right) = \frac{26x}{25}$.

$$\therefore \quad \frac{5x}{4} - \frac{26x}{25} = 10.50 \iff \frac{21x}{100} = 10.50 \iff x = \left(\frac{10.50 \times 100}{21}\right) = 50.$$

Hence, C.P. = Rs. 50.

Ex. 20. *The price of a jewel, passing through three hands, rises on the whole by 65%. If the first and the second sellers earned 20% and 25% profit respectively, find the percentage profit earned by the third seller.*

Sol. Let the original price of the jewel be Rs. P and let the profit earned by the third seller be $x\%$.

Then, $(100 + x)\%$ of 125% of 120% of P $= 165\%$ of P

$$\Rightarrow \left[\frac{(100+x)}{100} \times \frac{125}{100} \times \frac{120}{100} \times P\right] = \left(\frac{165}{100} \times P\right)$$

$$\Rightarrow (100 + x) = \left(\frac{165 \times 100 \times 100}{125 \times 120}\right) = 110 \Rightarrow x = 10\%.$$

Ex. 21. *A man sold two flats for Rs. 6,75,958 each. On one he gains 16% while on the other he loses 16%. How much does he gain or lose in the whole transaction?*

Sol. **Remember :** In such a case, there is always a loss. The selling price is immaterial.

$$\therefore \quad \text{Loss}\% = \left(\frac{\text{Common Loss and Gain}\%}{10}\right)^2 = \left(\frac{16}{10}\right)^2\% = \left(\frac{64}{25}\right)\% = 2.56\%.$$

Ex. 22. *A dealer sold three-fourth of his articles at a gain of 20% and the remaining at cost price. Find the gain earned by him in the whole transaction.*

Sol. Let C.P. of whole be Rs. x.

C.P. of $\frac{3}{4}$th = Rs. $\frac{3x}{4}$, C.P. of $\frac{1}{4}$th = Rs. $\frac{x}{4}$.

$$\therefore \quad \text{Total S.P.} = \text{Rs.} \left[\left(120\% \text{ of } \frac{3x}{4}\right) + \frac{x}{4}\right] = \text{Rs.} \left(\frac{9x}{10} + \frac{x}{4}\right) = \text{Rs.} \frac{23x}{20}.$$

$$\text{Gain} = \text{Rs.} \left(\frac{23x}{20} - x\right) = \text{Rs.} \frac{3x}{20}.$$

$$\therefore \quad \text{Gain}\% = \left(\frac{3x}{20} \times \frac{1}{x} \times 100\right)\% = 15\%.$$

Ex. 23. *A man bought a horse and a carriage for Rs. 3000. He sold the horse at a gain of 20% and the carriage at a loss of 10%, thereby gaining 2% on the whole. Find the cost of the horse.*   (M.B.A. 2002)

Sol. Let the C.P. of the horse be Rs. x. Then, C.P. of the carriage = Rs. $(3000 - x)$.

$$\therefore \quad 20\% \text{ of } x - 10\% \text{ of } (3000 - x) = 2\% \text{ of } 3000$$

$$\Rightarrow \quad \frac{x}{5} - \frac{(3000 - x)}{10} = 60 \Rightarrow 2x - 3000 + x = 600 \Rightarrow 3x = 3600 \Rightarrow x = 1200.$$

Hence, C.P. of the horse = Rs. 1200.

Ex. 24. *Find the single discount equivalent to a series discount of 20%, 10% and 5%.*

Sol. Let marked price be Rs. 100.

Then, Net S.P. = 95% of 90% of 80% of Rs. 100

$$= \text{Rs.} \left(\frac{95}{100} \times \frac{90}{100} \times \frac{80}{100} \times 100\right) = \text{Rs. } 68.40.$$

$$\therefore \quad \text{Required discount} = (100 - 68.40)\% = 31.6\%.$$

Ex. 25. *After getting two successive discounts, a shirt with a list price of Rs. 150 is available at Rs. 105. If the second discount is 12.5%, find the first discount.*

Sol. Let the first discount be $x\%$.

Then, 87.5% of $(100 - x)\%$ of $150 = 105$

$$\Rightarrow \quad \frac{87.5}{100} \times \frac{(100 - x)}{100} \times 150 = 105 \Rightarrow 100 - x = \left(\frac{105 \times 100 \times 100}{150 \times 87.5}\right) = 80$$

$$\Rightarrow \quad x = (100 - 80) = 20.$$

$$\therefore \quad \text{First discount} = 20\%.$$

Ex. 26. *An uneducated retailer marks all his goods at 50% above the cost price and thinking that he will still make 25% profit, offers a discount of 25% on the marked price. What is his actual profit on the sales ?* (IGNOU, 2003)

Sol. Let C.P. = Rs. 100. Then, marked price = Rs. 150.

S.P. = 75% of Rs. 150 = Rs. 112.50.

∴   Gain% = 12.50%.

Ex. 27. *A retailer buys 40 pens at the marked price of 36 pens from a wholesaler. If he sells these pens giving a discount of 1%, what is the profit percent ?* (S.S.C. 2003)

Sol. Let the marked price of each pen be Re. 1.

Then, C.P. of 40 pens = Rs. 36. S.P. of 40 pens = 99% of Rs. 40 = Rs. 39.60.

∴ Profit% = $\left(\dfrac{3.60}{36} \times 100\right)\% = 10\%.$

Ex. 28. *At what percentage above the C.P. must an article be marked so as to gain 33% after allowing a customer a discount of 5% ?* (M.B.A. 2003)

Sol. Let C.P. = Rs. 100. Then, S.P. = Rs. 133.

Let marked price be Rs. x.

Then, 95% of $x = 133$ ⇒ $\dfrac{95}{100}x = 133$ ⇒ $x = \left(133 \times \dfrac{100}{95}\right) = 140.$

∴   Marked price = 40% above C.P.

Ex. 29. *When a producer allows 36% commission on the retail price of his product, he earns a profit of 8.8%. What would be his profit percent if the commission is reduced by 24% ?* (M.B.A. 2002)

Sol. Let retail price = Rs. 100. Then, commission = Rs. 36.

∴   S.P. = Rs. (100 − 36) = Rs. 64.

But, profit = 8.8%.

∴   C.P. = Rs. $\left(\dfrac{100}{108.8} \times 64\right)$ = Rs. $\dfrac{1000}{17}.$

Now commission = Rs. 12. New S.P. = Rs. (100 − 12) = Rs. 88.

Gain = Rs. $\left(88 - \dfrac{1000}{17}\right)$ = Rs. $\dfrac{496}{17}.$

∴   Gain% = $\left(\dfrac{496}{17} \times \dfrac{17}{1000} \times 100\right)\% = 49.6\%.$

EXERCISE 11A

(OBJECTIVE TYPE QUESTIONS)

Directions : *Mark (✓) against the correct answer :*

1. I gain 70 paise on Rs. 70. My gain percent is :

    (a) 0.1%   (b) 1%   (c) 7%   (d) 10%

2. In terms of percentage profit, which is the best transaction ?   (C.B.I. 2003)

C.P. (in Rs.)	Profit (in Rs.)
(a) 36	17
(b) 50	24
(c) 40	19
(d) 60	29

3. If books bought at prices ranging from Rs. 200 to Rs. 350 are sold at prices ranging from Rs. 300 to Rs. 425, what is the greatest possible profit that might be made in selling eight books ?

   (a) Rs. 400   (b) Rs. 600

   (c) Cannot be determined   (d) None of these

4. A shopkeeper sold an article for Rs. 2090.42. Approximately, what will be the percentage profit if he sold that article for Rs. 2602.58 ?

   (a) 15%   (b) 20%   (c) 25%   (d) 30%

5. Alfred buys an old scooter for Rs. 4700 and spends Rs. 800 on its repairs. If he sells the scooter for Rs. 5800, his gain percent is :   (R.R.B. 2003)

   (a) $4\frac{4}{7}\%$ (b) $5\frac{5}{11}\%$ (c) 10%   (d) 12%

6. A shopkeeper purchased 70 kg of potatoes for Rs. 420 and sold the whole lot at the rate of Rs. 6.50 per kg. What will be his gain percent ?   (S.S.C. 2003)

   (a) $4\frac{1}{6}\%$ (b) $6\frac{1}{4}\%$ (c) $8\frac{1}{3}\%$ (d) 20%

7. Sam purchased 20 dozens of toys at the rate of Rs. 375 per dozen. He sold each one of them at the rate of Rs. 33. What was his percentage profit ? (**Bank P.O. 2000**)

   (a) 3.5   (b) 4.5   (c) 5.6   (d) 6.5   (e) None of these

8. 100 oranges are bought at the rate of Rs. 350 and sold at the rate of Rs. 48 per dozen. The percentage of profit or loss is :   (S.S.C. 2003)

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

9. A man buys a cycle for Rs. 1400 and sells it at a loss of 15%. What is the selling price of the cycle ?   (S.S.C. 2002)

   (a) Rs. 1090   (b) Rs. 1160   (c) Rs. 1190   (d) Rs. 1202

10. A sells an article which costs him Rs. 400 to B at a profit of 20%. B then sells it to C, making a profit of 10% on the price he paid to A. How much does C pay B ?

    (a) Rs. 472   (b) Rs. 476   (c) Rs. 528   (d) Rs. 532

11. Peter purchased a machine for Rs. 80,000 and spent Rs. 5000 on repair and Rs. 1000 on transpo.' and sold it with 25% profit. At what price did he sell the machine ?

    (a) Rs. 1,05,100   (b) Rs. 1,06,250   (c) Rs. 1,07,500

    (d) Rs. 1,17,500   (e) None of these   (**Bank P.O. 1998**)

12. By selling an article for Rs. 100, a man gains Rs. 15. Then, his gain% is :

    (a) 15%   (b) $12\frac{2}{3}\%$ (c) $17\frac{11}{17}\%$ (d) $17\frac{1}{4}\%$

13. When a commodity is sold for Rs. 34.80, there is a loss of 2%. What is the cost price of the commodity ?

    (a) Rs. 26.10   (b) Rs. 43   (c) Rs. 43.20   (d) Rs. 46.40

14. A shopkeeper expects a gain of $22\frac{1}{2}\%$ on his cost price. If in a week, his sale was of Rs. 392, what was his profit ?   (**Bank P.O. 2003**)

    (a) Rs. 18.20   (b) Rs. 70   (c) Rs. 72   (d) Rs. 88.25

15. The sale price of an article including the sales tax is Rs. 616. The rate of sales tax is 10%. If the shopkeeper has made a profit of 12%, then the cost price of the article is :

    (a) Rs. 500   (b) Rs. 515   (c) Rs. 550   (d) Rs. 600

16. Saransh purchased 120 reams of paper at Rs. 80 per ream. He spent Rs. 280 on transportation, paid octroi at the rate of 40 paise per ream and paid Rs. 72 to the coolie. If he wants to have a gain of 8%, what must be the selling price per ream ?

   (a) Rs. 86   (b) Rs. 87.48   (c) Rs. 89   (d) Rs. 90

17. A person bought 20 litres of milk at the rate of Rs. 8 per litre. He got it churned after spending Rs. 10 and 5 kg of cream and 20 litres of toned milk were obtained. If he sold the cream at Rs. 30 per kg and toned milk at Rs. 4 per litre, his profit in the transaction is :

   (a) 25%   (b) 35.3%   (c) 37.5%   (d) 42.5%

18. Jacob bought a scooter for a certain sum of money. He spent 10% of the cost on repairs and sold the scooter for a profit of Rs. 1100. How much did he spend on repairs if he made a profit of 20% ?   (Assistant Grade, 1997)

   (a) Rs. 400   (b) Rs. 440   (c) Rs. 500   (d) Rs. 550

19. A manufacturer undertakes to supply 2000 pieces of a particular component at Rs. 25 per piece. According to his estimates, even if 5% fail to pass the quality tests, then he will make a profit of 25%. However, as it turned out, 50% of the components were rejected. What is the loss to the manufacturer ?   (M.A.T. 2003)

   (a) Rs. 12,000   (b) Rs. 13,000   (c) Rs. 14,000   (d) Rs. 15,000

20. A trader buys a chair for Rs. 600 and sells it for Rs. 765 at a credit of 4 months. Reckoning money worth 6% p.a., his gain percent is :

   (a) 20%   (b) $22\frac{1}{2}$%   (c) 25%   (d) $27\frac{1}{2}$%

21. When a plot is sold for Rs. 18,700, the owner loses 15%. At what price must the plot be sold in order to gain 15% ?   (A.A.O. Exam, 2003)

   (a) Rs. 21,000   (b) Rs. 22,500   (c) Rs. 25,300   (d) Rs. 25,800

22. A fruitseller sells mangoes at the rate of Rs. 9 per kg and thereby loses 20%. At what price per kg, he should have sold them to make a profit of 5% ?   (R.R.B. 2002)

   (a) Rs. 11.81   (b) Rs. 12   (c) Rs. 12.25   (d) Rs. 12.31

23. A property dealer sells a house for Rs. 6,30,000 and in the bargain makes a profit of 5%. Had he sold it for Rs. 5,00,000, then what percentage of loss or gain he would have made ?   (Hotel Management, 2001)

   (a) $2\frac{1}{4}$% gain   (b) 10% loss   (c) $12\frac{1}{2}$% loss   (d) $16\frac{2}{3}$% loss

24. A shopkeeper sells one transistor for Rs. 840 at a gain of 20% and another for Rs. 960 at a loss of 4%. His total gain or loss percent is :   (Hotel Management, 1999)

   (a) $5\frac{15}{17}$% loss   (b) $5\frac{15}{17}$% gain   (c) $6\frac{2}{3}$% gain   (d) None of these

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

   (a) $16\frac{2}{3}$%   (b) $20\frac{1}{2}$%   (c) $25\frac{1}{2}$%   (d) $33\frac{1}{3}$%

26. The ratio of the cost price and the selling price is 4 : 5. The profit percent is :

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

                                (Hotel Management, 2003)

27. The ratio between the sale price and the cost price of an article is 7 : 5. What is the ratio between the profit and the cost price of that article ?   (Bank P.O. 2000)

   (a) 2 : 7   (b) 5 : 2   (c) 7 : 2

   (d) Data inadequate   (e) None of these

28. A man gains 20% by selling an article for a certain price. If he sells it at double the price, the percentage of profit will be : (S.S.C. 2004)

(a) 40 (b) 100 (c) 120 (d) 140

29. If selling price is doubled, the profit triples. Find the profit percent : (M.A.T. 2001)

(a) $66\frac{2}{3}$ (b) 100 (c) $105\frac{1}{3}$ (d) 120

30. At what profit percent must an article be sold so that by selling at half that price, there may be a loss of 30% ?

(a) 25% (b) 36% (c) 40% (d) 42%

31. The C.P. of an article is 40% of the S.P. The percent that the S.P. is of C.P. is :

(a) 250 (b) 240 (c) 60 (d) 40

32. By selling a pen for Rs. 15, a man loses one-sixteenth of what it costs him. The cost price of the pen is :

(a) Rs. 16 (b) Rs. 18 (c) Rs. 20 (d) Rs. 21

33. By selling an article, Michael earned a profit equal to one-fourth of the price he bought it. If he sold it for Rs. 375, what was the cost price ?

(a) Rs. 281.75 (b) Rs. 300 (c) Rs. 312.50 (d) Rs. 350

34. 10% loss on selling price is what percent loss on the cost price ?

(a) $9\frac{1}{11}$% (b) $9\frac{2}{11}$% (c) 10% (d) 11%

35. If loss is $\frac{1}{3}$ of S.P., the loss percentage is :

(a) $16\frac{2}{3}$% (b) 20% (c) 25% (d) $33\frac{1}{3}$%

36. In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit ? (M.A.T. 1998)

(a) 30% (b) 70% (c) 100% (d) 250%

37. The profit earned by selling an article for Rs. 832 is equal to the loss incurred when the same article is sold for Rs. 448. What should be the sale price for making 50% profit ? (Bank P.O. 2000)

(a) Rs. 920 (b) Rs. 960 (c) Rs. 1060 (d) Rs. 1200 (e) None of these

38. The profit earned by selling an article for Rs. 900 is double the loss incurred when the same article is sold for Rs. 450. At what price should the article be sold to make 25% profit ?

(a) Rs. 600 (b) Rs. 750 (c) Rs. 800 (d) Data inadequate

39. The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25% profit ? (SIDBI, 2000)

(a) Rs. 2000 (b) Rs. 2200 (c) Rs. 2400

(d) Data inadequate (e) None of these

40. Profit earned by selling an article for Rs. 1060 is 20% more than the loss incurred by selling the article for Rs. 950. At what price should the article be sold to earn 20% profit ?

(a) Rs. 980 (b) Rs. 1080 (c) Rs. 1800 (d) None of these

41. If the cost price of 12 pens is equal to the selling price of 8 pens, the gain percent is :

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

(S.S.C. 2004)

42. The cost price of 19 articles is equal to the selling price of 16 articles. Gain percent is :

(a) $3\frac{9}{17}\%$ (b) $15\frac{15}{19}\%$ (c) $18\frac{3}{4}\%$ (d) 20%

43. If the selling price of 50 articles is equal to the cost price of 40 articles, then the loss or gain percent is :   **(Hotel Management, 2003)**

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

44. If by selling 110 mangoes, the C.P. of 120 mangoes is realised, the gain percent is :

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

45. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is :   **(M.A.T. 2004)**

(a) 15   (b) 16   (c) 18   (d) 25

46. On an order of 5 dozen boxes of a consumer product, a retailer receives an extra dozen free. This is equivalent to allowing him a discount of :   **(C.B.I. 1997)**

(a) 15%   (b) $16\frac{1}{6}\%$ (c) $16\frac{2}{3}\%$ (d) 20%

47. A man sold 18 cots for Rs. 16,800, gaining thereby the cost price of 3 cots. The cost price of a cot is :   **(S.S.C. 2000)**

(a) Rs. 650   (b) Rs. 700   (c) Rs. 750   (d) Rs. 800

48. If on selling 12 notebooks, a seller makes a profit equal to the selling price of 4 notebooks, what is his percent profit ?   **(Bank P.O. 2000)**

(a) $16\frac{2}{3}$ (b) 25   (c) 50

(d) Data inadequate   (e) None of these

49. On selling 17 balls at Rs. 720, there is a loss equal to the cost price of 5 balls. The cost price of a ball is :   **(S.S.C. 2004)**

(a) Rs. 45   (b) Rs. 50   (c) Rs. 55   (d) Rs. 60

50. A vendor loses the selling price of 4 oranges on selling 36 oranges. His loss percent is :

(a) 10%   (b) $11\frac{1}{9}\%$ (c) $12\frac{1}{2}\%$ (d) None of these

51. A man buys 2 dozen bananas at Rs. 16 per dozen. After selling 18 bananas at the rate of Rs. 12 per dozen, the shopkeeper reduced the rate to Rs. 4 per dozen. The percent loss is :   **(Section Officers', 2003)**

(a) 25.2%   (b) 32.4%   (c) 36.5%   (d) 37.5%

52. A man bought apples at the rate of 8 for Rs. 34 and sold them at the rate of 12 for Rs. 57. How many apples should be sold to earn a net profit of Rs. 45 ?   **(S.S.C. 2003)**

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

53. Oranges are bought at the rate of 10 for Rs. 25 and sold at the rate of 9 for Rs. 25. The profit is :

(a) $9\frac{1}{11}\%$ (b) 10%   (c) $11\frac{1}{9}\%$ (d) $12\frac{1}{2}\%$

54. Some articles were bought at 6 for Rs. 5 and sold at 5 for Rs. 6. Gain percent is :

(a) 30%   (b) $33\frac{1}{3}\%$ (c) 35%   (d) 44%

(S.S.C. 2004)

55. A man bought some fruits at the rate of 16 for Rs. 24 and sold them at the rate of 8 for Rs. 18. What is the profit percent ?   **(Bank P.O. 2003)**

(a) 25%   (b) 40%   (c) 50%   (d) 60%   (e) None of these

56. A man purchased a box full of pencils at the rate of 7 for Rs. 9 and sold all of them at the rate of 8 for Rs. 11. In this transaction, he gained Rs. 10. How many pencils did the box contain ? (C.B.I. 1997)

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

57. A man bought a number of clips at 3 for a rupee and an equal number at 2 for a rupee. At what price per dozen should he sell them to make a profit of 20% ?

(a) Rs. 4   (b) Rs. 5   (c) Rs. 6   (d) Rs. 7

58. A man buys eggs at 2 for Re. 1 and an equal number at 3 for Rs. 2 and sells the whole at 5 for Rs. 3. His gain or loss percent is :

(a) $2\frac{2}{7}$% loss   (b) $3\frac{6}{7}$% gain   (c) $3\frac{2}{7}$% loss   (d) $2\frac{6}{7}$% gain

59. A man bought some oranges at Rs. 10 per dozen and bought the same number of oranges at Rs. 8 per dozen. He sold these oranges at Rs. 11 per dozen and gained Rs. 120. The total number of oranges bought by him was :

(a) 30 dozens   (b) 40 dozens   (c) 50 dozens   (d) 60 dozens

60. A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20% ? (C.B.I. 1998)

(a) 3   (b) 4   (c) 5   (d) 6

61. By selling 12 toffees for a rupee, a man loses 20%. How many for a rupee should he sell to get a gain of 20% ? (R.R.B. 2003)

(a) 5   (b) 8   (c) 10   (d) 15

62. By selling 45 lemons for Rs. 40, a man loses 20%. How many should he sell for Rs. 24 to gain 20% in the transaction ?

(a) 16   (b) 18   (c) 20   (d) 22

63. A trader mixes 26 kg of rice at Rs. 20 per kg with 30 kg of rice of other variety at Rs. 36 per kg and sells the mixture at Rs. 30 per kg. His profit percent is :

(a) No profit, no loss   (b) 5%   (c) 8%

(d) 10%   (e) None of these   (Bank P.O. 2003)

64. Arun purchased 30 kg of wheat at the rate of Rs. 11.50 per kg and 20 kg of wheat at the rate of Rs. 14.25 per kg. He mixed the two and sold the mixture. Approximately what price per kg should he sell the mixture to make 30% profit ? (Bank P.O. 1999)

(a) Rs. 14.80   (b) Rs. 15.40   (c) Rs. 15.60

(d) Rs. 16.30   (e) Rs. 18.20

65. Padam purchased 30 kg of rice at the rate of Rs. 17.50 per kg and another 30 kg rice at a certain rate. He mixed the two and sold the entire quantity at the rate of Rs. 18.60 per kg and made 20% overall profit. At what price per kg did he purchase the lot of another 30 kg rice ? (Bank P.O. 2000)

(a) Rs. 12.50   (b) Rs. 13.50   (c) Rs. 14.50

(d) Rs. 15.50   (e) None of these

66. A trader mixes three varieties of groundnuts costing Rs. 50, Rs. 20 and Rs. 30 per kg in the ratio 2 : 4 : 3 in terms of weight, and sells the mixture at Rs. 33 per kg. What percentage of profit does he make ? (Hotel Management, 1998)

(a) 8%   (b) 9%   (c) 10%   (d) None of these

67. A dairyman pays Rs. 6.40 per litre of milk. He adds water and sells the mixture at Rs. 8 per litre, thereby making 37.5% profit. The proportion of water to milk received by the customers is : (M.A.T. 2003)

(a) 1 : 10   (b) 1 : 12   (c) 1 : 15   (d) 1 : 20

68. By mixing two brands of tea and selling the mixture at the rate of Rs. 177 per kg, a shopkeeper makes a profit of 18%. If to every 2 kg of one brand costing Rs. 200 per kg, 3 kg of the other brand is added, then how much per kg does the other brand cost ?

    (a) Rs. 110   (b) Rs. 120   (c) Rs. 140   (d) None of these

69. The manufacturer of a certain item can sell all he can produce at the selling price of Rs. 60 each. It costs him Rs. 40 in materials and labour to produce each item and he has overhead expenses of Rs. 3000 per week in order to operate the plant. The number of units he should produce and sell in order to make a profit of at least Rs. 1000 per week, is :

    (a) 200   (b) 250   (c) 300   (d) 400

70. A dishonest dealer uses a scale of 90 cm instead of a metre scale and claims to sell at cost price. His profit is :   (N.I.F.T. 2000)

    (a) 9%   (b) 10%   (c) 12%   (d) None of these

71. A shopkeeper professes to sell his goods at cost price but uses a weight of 800 gm instead of kilogram weight. Thus, he makes a profit of :   (C.B.I. 1997)

    (a) 20%   (b) $16\frac{2}{3}$%   (c) 25%   (d) None of these

72. A dishonest dealer professes to sell his goods at cost price. But he uses a false weight and thus gains $6\frac{18}{47}$%. For a kg, he uses a weight of :   (A.A.O. Exam, 2003)

    (a) 940 gms   (b) 947 gms   (c) 953 gms   (d) 960 gms

73. A shopkeeper cheats to the extent of 10% while buying as well as selling, by using false weights. His total gain is :   (Bank P.O. 2003)

    (a) 10%   (b) 11%   (c) 20%   (d) 21%   (e) $22\frac{2}{9}$%

74. A grocer sells rice at a profit of 10% and uses weights which are 20% less than the market weight. The total gain earned by him will be :

    (a) 30%   (b) 35%   (c) 37.5%   (d) None of these

75. A fair price shopkeeper takes 10% profit on his goods. He lost 20% goods during theft. His loss percent is :   (S.S.C. 2000)

    (a) 8   (b) 10   (c) 11   (d) 12

76. A sells a bicycle to B at a profit of 20%. B sells it to C at a profit of 25%. If C pays Rs. 225 for it, the cost price of the bicycle for A is :   (B.S.F. 2001)

    (a) Rs. 110   (b) Rs. 120   (c) Rs. 125   (d) Rs. 150

77. A bought a radio set and spent Rs. 110 on its repairs. He then sold it to B at 20% profit, B sold it to C at a loss of 10% and C sold it for Rs. 1188 at a profit of 10%. What is the amount for which A bought the radio set ?

    (a) Rs. 850   (b) Rs. 890   (c) Rs. 930   (d) Rs. 950

78. A house worth Rs. 1,50,000 is sold by X to Y at 5% profit. Y sells the house back to X at 2% loss. Then, in the entire transaction :

    (a) X loses Rs. 1350   (b) X gains Rs. 3150

    (c) X loses Rs. 4350   (d) X gains Rs. 4350

79. A manufacturer sells a pair of glasses to a wholesale dealer at a profit of 18%. The wholesaler sells the same to a retailer at a profit of 20%. The retailer in turn sells them to a customer for Rs. 30.09, thereby earning a profit of 25%. The cost price for the manufacturer is :

    (a) Rs. 15   (b) Rs. 16   (c) Rs. 17   (d) Rs. 18

80. An article was sold for Rs. 144. If the percentage of profit was numerically equal to the cost price, the cost of the article was :

    (a) Rs. 72   (b) Rs. 80   (c) Rs. 90   (d) Rs. 100

81. Rahul purchased a scooter at $\frac{13}{15}$th of its selling price and sold it at 12% more than its selling price. His gain is :

    (a) 20%   (b) $29\frac{3}{13}$%   (c) 30%   (d) $38\frac{1}{13}$%

82. A man buys an article for 10% less than its value and sells it for 10% more than its value. His gain or loss percent is : **(S.S.C. 1999)**

    (a) no profit, no loss   (b) 20% profit

    (c) less than 20% profit   (d) more than 20% profit

83. Samant bought a microwave oven and paid 10% less than the original price. He sold it with 30% profit on the price he had paid. What percentage of profit did Samant earn on the original price ? **(Bank P.O. 2002)**

    (a) 17%   (b) 20%   (c) 27%   (d) 32%   (e) None of these

84. If 5% more is gained by selling an article for Rs. 350 than by selling it for Rs. 340, the cost of the article is : **(C.B.I. 1997)**

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

85. If a man reduces the selling price of a fan from Rs. 400 to Rs. 380, his loss increases by 2%. The cost price of the fan is : **(R.R.B. 2001)**

    (a) Rs. 480   (b) Rs. 500   (c) Rs. 600   (d) None of these

86. An article when sold at a gain of 5% yields Rs. 15 more than when sold at a loss of 5%. Its cost price would be :

    (a) Rs. 150   (b) Rs. 200   (c) Rs. 250   (d) Rs. 300

87. A shopkeeper sells an article at a loss of $12\frac{1}{2}$%. Had he sold it for Rs. 51.80 more, he would have earned a profit of 6%. The cost price of the article is :

    (a) Rs. 280   (b) Rs. 300   (c) Rs. 380   (d) Rs. 400

    (Section Officers', 2003)

88. The difference between the cost price and sale price of an article is Rs. 240. If the profit is 20%, the selling price is :

    (a) Rs. 1240   (b) Rs. 1400   (c) Rs. 1600   (d) None of these

89. A dealer sold an article at a loss of $2\frac{1}{2}$%. Had he sold it for Rs. 100 more, he would have gained $7\frac{1}{2}$%. To gain $12\frac{1}{2}$% , he should sell it for :

    (a) Rs. 850   (b) Rs. 925   (c) Rs. 1080   (d) Rs. 1125

90. The cash difference between the selling prices of an article at a profit of 4% and 6% is Rs. 3. The ratio of the two selling prices is : **(C.B.I. 2003)**

    (a) 51 : 52   (b) 52 : 53   (c) 51 : 53   (d) 52 : 55

91. A shopkeeper sells two watches for Rs. 308 each. On one he gets 12% profit and on the other 12% loss. His profit or loss in the entire transaction was : **(B.S.F. 2001)**

    (a) Neither profit, nor loss   (b) $1\frac{11}{25}$% loss

    (c) $1\frac{11}{25}$% profit   (d) $3\frac{2}{25}$% loss

92. A man sells two flats at the rate of Rs. 1.995 lakhs each. On one he gains 5% and on the other, he loses 5%. His gain or loss percent in the whole transaction is :

    (a) 0.25% loss   (b) 0.25% gain   (c) 2.5% loss   (d) 25% loss

93. A man sells two commodities for Rs. 4000 each, neither losing nor gaining in the deal. If he sold one commodity at a gain of 25%, the other commodity is sold at a loss of :

   (a) $16\frac{2}{3}$%   (b) $18\frac{2}{9}$%   (c) 25%   (d) None of these.

94. A house and a shop were sold for Rs. 1 lakh each. In this transaction, the house sale resulted into 20% loss whereas the shop sale resulted into 20% profit. The entire transaction resulted in :

   (a) no loss, no gain   (b) loss of Rs. $\frac{1}{12}$ lakh

   (c) loss of Rs. $\frac{1}{18}$ lakh   (d) gain of Rs. $\frac{1}{24}$ lakh

95. Ranjan purchased 120 tables at a price of Rs. 110 per table. He sold 30 tables at a profit of Rs. 12 per table and 75 tables at a profit of Rs. 14 per table. The remaining tables were sold at a loss of Rs. 7 per table. What is the average profit per table ?

   (a) Rs. 10.04   (b) Rs. 10.875   (c) Rs. 12.80   (d) Rs. 12.875

96. Hemant sold 10 sarees for a total profit of Rs. 460 and 12 sarees for a total profit of Rs. 144. At what profit per saree should he sell the remaining 20 sarees so that he gets an average profit of Rs. 18 per saree ?

   (a) Rs. 7.40   (b) Rs. 7.60   (c) Rs. 7.80   (d) Rs. 8

97. Sanket purchased 20 dozen notebooks at Rs. 48 per dozen. He sold 8 dozen at 10% profit and the remaining 12 dozen with 20% profit. What is his profit percentage in the transaction ?

   (a) 7.68   (b) 15   (c) 16   (d) 19.2

98. A man purchased sugar worth Rs. 400. He sold $\frac{3}{4}$th at a loss of 10% and the remainder at a gain of 10%. On the whole, he gets :

   (a) a loss of 5%   (b) a gain of $5\frac{1}{2}$%

   (c) a loss of $5\frac{1}{19}$%   (d) a loss of $5\frac{5}{19}$%

99. A businessman sold $\frac{2}{3}$ of his stock at a gain of 20% and the rest at a gain of 14%. The overall percentage of gain to the businessman is :

   (a) 12%   (b) 17%   (c) 18%   (d) 20%

100. A cloth merchant sold half of his cloth at 20% profit, half of the remaining at 20% loss and the rest was sold at the cost price. In the total transaction, his gain or loss will be :   (S.S.C. 2003)

   (a) Neither loss nor gain   (b) 5% loss
   (c) 5% gain   (d) 10% gain

101. A person purchases 90 clocks and sells 40 clocks at a gain of 10% and 50 clocks at a gain of 20%. If he sold all of them at a uniform profit of 15%, then he would have got Rs. 40 less. The cost price of each clock is :   (Hotel Management, 2003)

   (a) Rs. 50   (b) Rs. 60   (c) Rs. 80   (d) Rs. 90

102. A person earns 15% on an investment but loses 10% on another investment. If the ratio of the two investments be 3 : 5, what is the gain or loss on the two investments taken together ?

   (a) $6\frac{1}{4}$% loss   (b) $13\frac{1}{8}$% gain   (c) $13\frac{1}{8}$% loss   (d) None of these

103. A man bought goods worth Rs. 6000 and sold half of them at a gain of 10%. At what gain percent must he sell the remainder so as to get a gain of 25% on the whole ?

   (a) 25%   (b) 30%   (c) 35%   (d) 40%

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    (a) Rs. 72   (b) Rs. 80   (c) Rs. 90   (d) Rs. 100

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    (a) Rs. 150   (b) Rs. 200   (c) Rs. 250   (d) Rs. 300

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    (a) Rs. 1240   (b) Rs. 1400   (c) Rs. 1600   (d) None of these

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    (a) 51 : 52   (b) 52 : 53   (c) 51 : 53   (d) 52 : 55

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    (c) $1\frac{11}{25}$% profit   (d) $3\frac{2}{25}$% loss

92. A man sells two flats at the rate of Rs. 1.995 lakhs each. On one he gains 5% and on the other, he loses 5%. His gain or loss percent in the whole transaction is :

    (a) 0.25% loss   (b) 0.25% gain   (c) 2.5% loss   (d) 25% loss

104. A fruitseller has 24 kg of apples. He sells a part of these at a gain of 20% and the balance at a loss of 5%. If on the whole he earns a profit of 10%, the amount of apples sold at a loss is :

    (a) 4.6 kg   (b) 6 kg   (c) 9.6 kg   (d) 11.4 kg

105. Two-third of a consignment was sold at a profit of 5% and the remainder at a loss of 2%. If the total profit was Rs. 400, the value of the consignment (in Rs.) was :

    (a) 10,000   (b) 12,000   (c) 15,000   (d) 20,000

106. A trader purchases a watch and a wall clock for Rs. 390. He sells them making a profit of 10% on the watch and 15% on the wall clock. He earns a profit of Rs. 51.50. The difference between the original prices of the wall clock and the watch is equal to :

    (a) Rs. 80   (b) Rs. 100   (c) Rs. 110   (d) Rs. 120

107. Albert buys 4 horses and 9 cows for Rs. 13,400. If he sells the horses at 10% profit and the cows at 20% profit, then he earns a total profit of Rs. 1880. The cost of a horse is :   (C.D.S. 2003)

    (a) Rs. 1000   (b) Rs. 2000   (c) Rs. 2500   (d) Rs. 3000

108. A man purchases two clocks A and B at a total cost of Rs. 650. He sells A with 20% profit and B at a loss of 25% and gets the same selling price for both the clocks. What are the purchasing prices of A and B respectively ?

    (a) Rs. 225, Rs. 425   (b) Rs. 250, Rs. 400
    (c) Rs. 275, Rs. 375   (d) Rs. 300, Rs. 350

109. The C.P. of two watches taken together is Rs. 840. If by selling one at a profit of 16% and the other at a loss of 12%, there is no loss or gain in the whole transaction, then the C.P. of the two watches are respectively :

    (a) Rs. 360, Rs. 480   (b) Rs. 480, Rs. 360
    (c) Rs. 380, Rs. 460   (d) Rs. 400, Rs. 440

110. On selling a chair at 7% loss and a table at 17% gain, a man gains Rs. 296. If he sells the chair at 7% gain and the table at 12% gain, then he gains Rs. 400. The actual price of the table is :

    (a) Rs. 1600   (b) Rs. 1800   (c) Rs. 2200   (d) Rs. 2400

111. A shopkeeper offers 2.5% discount on cash purchases. What cash amount would Rohan pay for a cycle, the marked price of which is Rs. 650 ?   (IGNOU, 2003)

    (a) Rs. 633.25   (b) Rs. 633.75   (c) Rs. 634   (d) Rs. 635

112. If a company sells a car with a marked price of Rs. 2,72,000 and gives a discount of 4% on Rs. 2,00,000 and 2.5% on the remaining amount of Rs. 72,000, then the actual price charged by the company for the car is :   (S.S.C. 2003)

    (a) Rs. 2,50,000   (b) Rs. 2,55,000   (c) Rs. 2,60,100   (d) Rs. 2,62,200

113. Garima purchased a briefcase with an additional 10% discount on the reduced price after deducting 20% on the labelled price. If the labelled price was Rs. 1400, at what price did she purchase the briefcase ?   (Bank P.O. 2002)

    (a) Rs. 980   (b) Rs. 1008   (c) Rs. 1056   (d) Rs. 1120   (e) None of these

114. A bag marked at Rs. 80 is sold for Rs. 68. The rate of discount is :

    (a) 12%   (b) 15%   (c) $17\frac{11}{17}$%   (d) 20%

115. A pair of articles was bought for Rs. 37.40 at a discount of 15%. What must be the marked price of each of the articles ?   (A.A.O. Exam, 2003)

    (a) Rs. 11   (b) Rs. 22   (c) Rs. 33   (d) Rs. 44

116. A shopkeeper gives 12% additional discount on the discounted price, after giving an initial discount of 20% on the labelled price of a radio. If the final sale price of the radio is Rs. 704, then what is its labelled price ?   (R.R.B. 2002)

    (a) Rs. 844.80   (b) Rs. 929.28   (c) Rs. 1000   (d) Rs. 1044.80

117. A fan is listed at Rs. 1500 and a discount of 20% is offered on the list price. What additional discount must be offered to the customer to bring the net price to Rs. 1104 ?

(a) 8%   (b) 10%   (c) 12%   (d) 15%

(S.S.C. 2002)

118. A discount of 15% on one article is the same as a discount of 20% on another article. The costs of the two articles can be :   (S.S.C. 1999)

(a) Rs. 40, Rs. 20   (b) Rs. 60, Rs. 40   (c) Rs. 80, Rs 60   (d) Rs. 60, Rs. 40

119. If the S.P. of Rs. 24 results in a 20% discount on list price, what S.P. would result in a 30% discount on list price ?

(a) Rs. 18   (b) Rs. 20   (c) Rs. 21   (d) Rs. 27

120. An article was sold for Rs. y after giving a discount of x%. Then, its list price is :

(a) $\frac{100y}{100-x}$ (b) $\frac{100y}{1-x}$ (c) $\frac{100y}{1-(x/100)}$ (d) None of these

121. Jatin bought a refrigerator with 20% discount on the labelled price. Had he bought it with 25% discount, he would have saved Rs. 500. At what price did he buy the refrigerator ?

(a) Rs. 5000   (b) Rs. 10,000   (c) Rs. 12,500   (d) Rs. 15,000

122. A manufacturer offers a 20% rebate on the marked price of a product. The retailer offers another 30% rebate on the reduced price. The two reductions are equivalent to a single reduction of :

(a) 40%   (b) 44%   (c) 46%   (d) 50%

123. Successive discounts of 10%, 12% and 15% amount to a single discount of :

(a) 32.68%   (b) 35.28%   (c) 36.68%   (d) None of these

(R.R.B. 2003)

124. List price of an article at a showroom is Rs. 2000 and it is being sold at successive discounts of 20% and 10%. Its net selling price will be :   (S.S.C. 2004)

(a) Rs. 1400   (b) Rs. 1440   (c) Rs. 1520   (d) Rs. 1700

125. Find the selling price of an article if a shopkeeper allows two successive discounts of 5% each on the marked price of Rs. 80.   (C.B.I. 2003)

(a) Rs. 70.10   (b) Rs. 70.20   (c) Rs. 72   (d) Rs. 72.20

126. The price of a VCR is marked at Rs. 12,000. If successive discounts of 15%, 10% and 5% be allowed, then at what price does a customer buy it ?

(a) Rs. 8400   (b) Rs. 8721   (c) Rs. 8856   (d) None of these

(Hotel Management, 2002)

127. After successive discounts of 12% and 5% an article was sold for Rs. 209. What was the original price of the article ?

(a) Rs. 226   (b) Rs. 250   (c) Rs. 252   (d) Rs. 269

128. Applied to a bill for Rs. 1,00,000, the difference between a discount of 40% and two successive discounts of 36% and 4% is :   (Section Officers', 2003)

(a) Nil   (b) Rs. 1440   (c) Rs. 2500   (d) Rs. 1960

129. The difference between a discount of 35% and two successive discounts of 20% on a certain bill was Rs. 22. Find the amount of the bill.   (Bank P.O. 1999)

(a) Rs. 200   (b) Rs. 1100   (c) Rs. 2200

(d) Data inadequate   (e) None of these

130. Two shopkeepers announce the same price of Rs. 700 for a sewing machine. The first offers successive discounts of 30% and 6% while the second offers successive discounts of 20% and 16%. The shopkeeper that offers better discount, charges .... less than the other shopkeeper.

(a) Rs. 9.80   (b) Rs. 16.80   (c) Rs. 22.40   (d) Rs. 36.40

131. The marked price of a watch was Rs. 720. A man bought the same for Rs. 550.80 after getting two successive discounts, the first being 10%. What was the second discount rate ?   (S.S.C. 2000)

   (a) 12%   (b) 14%   (c) 15%   (d) 18%

132. A shopkeeper purchased 150 identical pieces of calculators at the rate of Rs. 250 each. He spent an amount of Rs. 2500 on transport and packing. He fixed the labelled price of each calculator at Rs. 320. However, he decided to give a discount of 5% on the labelled price. What is the percentage profit earned by him ? (Bank P.O. 1999)

   (a) 14%   (b) 15%   (c) 16%   (d) 20%   (e) None of these

133. A trader marked the price of his commodity so as to include a profit of 25%. He allowed discount of 16% on the marked price. His actual profit was :   (S.S.C. 2004)

   (a) 5%   (b) 9%   (c) 16%   (d) 25%

134. A tradesman marks his goods 30% above the C.P. If he allows a discount of $6\frac{1}{4}\%$, then his gain percent is :

   (a) $21\frac{7}{8}\%$ (b) 22%   (c) $23\frac{3}{4}\%$ (d) None of these

135. The price of an article is raised by 30% and then two successive discounts of 10% each are allowed. Ultimately, the price of the article is :   (S.S.C. 2003)

   (a) decreased by 5.3%   (b) increased by 3%
   (c) increased by 5.3%   (d) increased by 10%

136. A retailer buys 30 articles from a wholesaler at the price of 27. If he sells them at their marked price, the gain percent in the transaction is :

   (a) $9\frac{1}{11}\%$ (b) 10%   (c) $11\frac{1}{9}\%$ (d) $16\frac{2}{3}\%$

137. By selling an umbrella for Rs. 300, a shopkeeper gains 20%. During a clearance sale, the shopkeeper allows a discount of 10% on the marked price. His gain percent during the sale is :   (M.B.A. 2002)

   (a) 7   (b) 7.5   (c) 8   (d) 9

138. The cost price of an article is 64% of the marked price. Calculate the gain percent after allowing a discount of 12%.   (C.B.I. 1998)

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

139. A shopkeeper allows a discount of 10% on the marked price of an item but charges a sales tax of 8% on the discounted price. If the customer pays Rs. 680.40 as the price including the sales tax, then what is the marked price of the item ?

   (a) Rs. 630   (b) Rs. 700   (c) Rs. 780   (d) None of these

140. At what percent above the cost price must a shopkeeper mark his goods so that he gains 20% even after giving a discount of 10% on the marked price ? (S.S.C. 2004)

   (a) 25%   (b) 30%   (c) $33\frac{1}{3}\%$ (d) $37\frac{1}{2}\%$

141. At what price should a shopkeeper mark a radio that costs him Rs. 1200 in order that he may offer a discount of 20% on the marked price and still make a profit of 25% ?

   (a) Rs. 1675   (b) Rs. 1875   (c) Rs. 1900   (d) Rs. 2025   (e) None of these

                                                           (Bank P.O. 1998)

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

   (a) 45 : 56   (b) 50 : 61   (c) 55 : 69   (d) 99 : 125

143. By selling an article at $\frac{2}{5}$ of the marked price, there is a loss of 25%. The ratio of the marked price and the cost price of the article is :   (S.S.C. 2003)

   (a) 2 : 5   (b) 5 : 2   (c) 8 : 15   (d) 15 : 8

144. A tradesman gives 4% discount on the marked price and gives 1 article free for buying every 15 articles and thus gains 35%. The marked price is above the cost price by :

    (a) 20%   (b) 39%   (c) 40%   (d) 50%

145. A trader marked the selling price of an article at 10% above the cost price. At the time of selling, he allows certain discount and suffers a loss of 1%. He allowed a discount of :   (S.S.C. 2003)

    (a) 9%   (b) 10%   (c) 10.5%   (d) 11%

146. A shopkeeper fixes the marked price of an item 35% above its cost price. The percentage of discount allowed to gain 8% is :   (Assistant Grade, 1997)

    (a) 20%   (b) 27%   (c) 31%   (d) 43%

147. A trader marked his goods at 20% above the cost price. He sold half the stock at the marked price, one quarter at a discount of 20% on the marked price and the rest at a discount of 40% on the marked price. His total gain is :   (S.S.C. 2004)

    (a) 2%   (b) 4.5%   (c) 13.5%   (d) 15%

148. A product when sold with 10% rebate on the listed price gave a profit of Rs. 70. What was its cost price ?   (Bank P.O. 2003)

    (a) Rs. 200   (b) Rs. 350   (c) Rs. 700

    (d) Cannot be determined   (e) None of these

149. The labelled price of a cupboard is Rs. 6500. The shopkeeper sold it by giving 5% discount on the labelled price and earned a profit of 15%. What approximately is the cost price of the cupboard ?   (Bank P.O. 1999)

    (a) Rs. 5000   (b) Rs. 5350   (c) Rs. 5600   (d) Rs. 5800   (e) Rs. 6000

150. Kunal bought a suitcase with 15% discount on the labelled price. He sold the suitcase for Rs. 2880 with 20% profit on the labelled price. At what price did he buy the suitcase?   (S.B.I.P.O. 1997)

    (a) Rs. 2040   (b) Rs. 2400   (c) Rs. 2604   (d) Rs. 2540   (e) None of these

151. A shopkeeper sells a badminton racket, whose marked price is Rs. 30, at a discount of 15% and gives a shuttle cock costing Rs. 1.50 free with each racket. Even then he makes a profit of 20%. His cost price per racket is :   (S.S.C. 2004)

    (a) Rs. 19.75   (b) Rs. 20   (c) Rs. 21   (d) Rs. 21.25

152. If a commission of 10% is given on the written price of an article, the gain is 20%. If the commission is increased to 20%, the gain is :

    (a) $6\frac{2}{3}$%   (b) $7\frac{1}{4}$%   (c) $12\frac{1}{2}$%   (d) $13\frac{1}{3}$%

153. A shopkeeper sold a T.V. set for Rs. 17,940 with a discount of 8% and earned a profit of 19.6%. What would have been the percentage of profit earned if no discount was offered ?   (Bank P.O. 2003)

    (a) 24.8%   (b) 25%   (c) 26.4%

    (d) Cannot be determined   (e) None of these

154. A shopkeeper sells 25 articles at Rs. 45 per article after giving 10% discount and earns 50% profit. If the discount is not given, the profit gained is :   (S.B.I.P.O. 2000)

    (a) 60%   (b) $60\frac{2}{3}$%   (c) 66%   (d) $66\frac{2}{3}$%   (e) None of these

155. A shopkeeper sold sarees at Rs. 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 ?   (S.B.I.P.O. 1999)

    (a) Rs. 240   (b) Rs. 260   (c) Rs. 280

    (d) Data inadequate   (e) None of these

156. Even after reducing the marked price of a transistor by Rs. 32, a shopkeeper makes a profit of 15%. If the cost price be Rs. 320, what percentage of profit would he have made if he had sold the transistor at the marked price ?

(a) 10%   (b) 20%   (c) 25%   (d) None of these

157. 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 was offered ?

(a) 24.5   (b) 28.5   (c) 30

(d) Data inadequate   (e) None of these   (Bank P.O. 2002)

158. Komal buys an article at a discount of 25%. At what percentage above the cost price should he sell it to make a profit of 25% over the original list price ?

(a) 25   (b) 30   (c) 40   (d) 66.67

159. Peter bought an item at 20% discount on its original price. He sold it with 40% increase on the price he bought it. The new sale price is by what percent more than the original price ?   (Bank P.O. 2003)

(a) 7.5   (b) 8   (c) 10   (d) 12   (e) None of these

160. Tarun got 30% concession on the labelled price of an article and sold it for Rs. 8750 with 25% profit on the price he bought. What was the labelled price ?

(a) Rs. 10,000   (b) Rs. 12,000   (c) Rs. 16,000

(d) Data inadequate   (e) None of these

ANSWERS

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

SOLUTIONS

1. Gain% $= \left(\dfrac{0.70}{70} \times 100 \right)\% = 1\%$.

2. (a) Profit% $= \left(\dfrac{17}{36} \times 100 \right)\% = 47\dfrac{2}{9}\%$.   (b) Profit% $= \left(\dfrac{24}{50} \times 100 \right)\% = 48\%$.

(c) Profit% $= \left(\frac{19}{40} \times 100\right)\% = 47\frac{1}{2}\%$.   (d) Profit% $= \left(\frac{29}{60} \times 100\right)\% = 48\frac{1}{3}\%$.

Clearly, (d) is the best transaction.

3. Least C.P. = Rs. (200×8) = Rs. 1600. Greatest S.P. = Rs. (425×8) = Rs. 3400.
   Required profit = Rs. $(3400 - 1600)$ = Rs. 1800.

4. Profit = Rs. $(2602.58 - 2090.42)$ = Rs. 512.16.

$$\text{Profit}\% = \left(\frac{512.16}{2090.42} \times 100\right)\% = \left(\frac{512160}{209042} \times 10\right)\% = 24.5\% \approx 25\%.$$

5. C.P. = Rs. $(4700 + 800)$ = Rs. 5500; S.P. = Rs. 5800.

$$\text{Gain}\% = \left(\frac{300}{5500} \times 100\right)\% = 5\frac{5}{11}\%.$$

6. C.P. of 1 kg = Rs. $\left(\frac{420}{70}\right)$ = Rs. 6. S.P. of 1 kg = Rs. 6.50.

$$\therefore \quad \text{Gain}\% = \left(\frac{0.50}{6} \times 100\right)\% = \frac{25}{3}\% = 8\frac{1}{3}\%.$$

7. C.P. of 1 toy = Rs. $\left(\frac{375}{12}\right)$ = Rs. 31.25. S.P. of 1 toy = Rs. 33.

$$\therefore \quad \text{Profit}\% = \left(\frac{1.75}{31.25} \times 100\right)\% = \frac{28}{5}\% = 5.6\%.$$

8. C.P. of 1 orange = Rs. $\left(\frac{350}{100}\right)$ = Rs. 3.50. S.P. of 1 orange = Rs. $\left(\frac{48}{12}\right)$ = Rs. 4.

$$\therefore \quad \text{Gain}\% = \left(\frac{0.50}{3.50} \times 100\right)\% = \frac{100}{7}\% = 14\frac{2}{7}\%.$$

9. S.P. = 85% of Rs. 1400 = Rs. $\left(\frac{85}{100} \times 1400\right)$ = Rs. 1190.

10. C.P. for B = 120% of Rs. 400 = Rs. $\left(\frac{120}{100} \times 400\right)$ = Rs. 480.

    C.P. for C = 110% of Rs. 480 = Rs. $\left(\frac{110}{100} \times 480\right)$ = Rs. 528.

11. C.P. = Rs. $(80000 + 5000 + 1000)$ = Rs. 86000, Profit = 25%.

    $\therefore$ S.P. = 125% of Rs. 86000 = Rs. $\left(\frac{125}{100} \times 86000\right)$ = Rs. 107500.

12. S.P. = Rs. 100, gain = Rs. 15.
    $\therefore$ C.P. = Rs. $(100 - 15)$ = Rs. 85.

$$\text{Gain}\% = \left(\frac{15}{85} \times 100\right)\% = \frac{300}{17}\% = 17\frac{11}{17}\%$$

13. C.P. = Rs. $\left(\frac{100}{75} \times 34.80\right)$ = Rs. 46.40.

14. C.P. = Rs. $\left(\frac{100}{122.50} \times 392\right)$ = Rs. $\left(\frac{1000}{1225} \times 392\right)$ = Rs. 320.
    $\therefore$ Profit = Rs. $(392 - 320)$ = Rs. 72.

15. 110% of S.P. $= 616 \Rightarrow$ S.P. $=$ Rs. $\left(\dfrac{616 \times 100}{110}\right) =$ Rs. 560.

$\therefore$ C.P. $=$ Rs. $\left(\dfrac{100}{112} \times 560\right) =$ Rs. 500.

16. Total investment $=$ Rs. $\left(120 \times 80 + 280 + \dfrac{40}{100} \times 120 + 72\right)$

$=$ Rs. $(9600 + 280 + 48 + 72) =$ Rs. 10000.

S.P. of 120 reams $= 108\%$ of Rs. 10000 $=$ Rs. 10800.

$\therefore$ S.P. per ream $=$ Rs. $\left(\dfrac{10800}{120}\right) =$ Rs. 90.

17. Investment $=$ Rs. $(20 \times 8 + 10) =$ Rs. 170. Receipt $=$ Rs. $(30 \times 5 + 20 \times 4) =$ Rs. 230.

$\therefore$ Gain$\% = \left(\dfrac{60}{170} \times 100\right)\% = 35.29\% = 35.3\%.$

18. Let the C.P. be Rs. x. Then, 20% of $x = 1100 \Rightarrow \dfrac{20}{100} \times x = 1100 \Rightarrow x = 5500.$

C.P. $=$ Rs. 5500, Expenditure on repairs $= 10\%$.

Actual price $=$ Rs. $\left(\dfrac{100}{110} \times 5500\right) =$ Rs. 5000.

$\therefore$ Expenditure on repairs $=$ Rs. $(5500 - 5000) =$ Rs. 500.

19. Total cost incurred $=$ Rs. $\left[\dfrac{100}{125} \times 25 \times (95\% \text{ of } 2000)\right]$

$=$ Rs. $\left(\dfrac{100}{125} \times 25 \times 1900\right) =$ Rs. 38000.

Loss to the manufacturer $=$ Rs. $[38000 - (25 \times 1000)] =$ Rs. 13000.

20. C.P. $=$ Rs. $\left(600 + \dfrac{600 \times 6 \times 4}{100 \times 12}\right) =$ Rs. 612. Gain $=$ Rs. $(765 - 612) =$ Rs. 153.

$\therefore$ Gain$\% = \left(\dfrac{153}{612} \times 100\right)\% = 25\%.$

21. $85 : 18700 = 115 : x$ or $x = \left(\dfrac{18700 \times 115}{85}\right) = 25300.$

Hence, S.P. $=$ Rs. 25,300.

22. $80 : 9 = 105 : x$ or $x = \left(\dfrac{9 \times 105}{80}\right) = 11.81.$

Hence, S.P. per kg $=$ Rs. 11.81.

23. C.P. $=$ Rs. $\left(\dfrac{100}{105} \times 630000\right) =$ Rs. 600000.

$\therefore$ Required loss$\% = \left(\dfrac{100000}{600000} \times 100\right)\% = 16\dfrac{2}{3}\%.$

24. C.P. of 1st transistor $=$ Rs. $\left(\dfrac{100}{120} \times 840\right) =$ Rs. 700.

C.P. of 2nd transistor $=$ Rs. $\left(\dfrac{100}{96} \times 960\right) =$ Rs. 1000.

So, total C.P. = Rs. $(700 + 1000)$ = Rs. 1700.

Total S.P. = Rs. $(840 + 960)$ = Rs. 1800.

$\therefore$ Gain% $= \left(\dfrac{100}{1700} \times 100\right)\% = 5\dfrac{15}{17}\%.$

25. Let C.P. = Rs. x. Then, S.P. = Rs. $\dfrac{4x}{3}$. Gain = Rs. $\left(\dfrac{4x}{3} - x\right)$ = Rs. $\dfrac{x}{3}$.

$\therefore$ Gain% $= \left(\dfrac{x}{3} \times \dfrac{1}{x} \times 100\right)\% = 33\dfrac{1}{3}\%.$

26. Let C.P. = Rs. $4x$. Then, S.P. = Rs. $5x$. Gain = Rs. $(5x - 4x)$ = Rs. x.

$\therefore$ Gain% $= \left(\dfrac{x}{4x} \times 100\right)\% = 25\%.$

27. Let C.P. = Rs. $5x$ and S.P. = Rs. $7x$. Then, Gain = Rs. $2x$.

$\therefore$ Required ratio = $2x : 5x = 2 : 5$.

28. Let C.P. = Rs. x. Then, S.P. = Rs. (120% of x) = Rs. $\dfrac{6x}{5}$.

New S.P. = Rs. $\left(2 \times \dfrac{6x}{5}\right)$ = Rs. $\dfrac{12x}{5}$. Profit = Rs. $\left(\dfrac{12x}{5} - x\right)$ = Rs. $\dfrac{7x}{5}$.

$\therefore$ Profit% $= \left(\dfrac{7x}{5} \times \dfrac{1}{x} \times 100\right)\% = 140\%.$

29. Let C.P. be Rs. x and S.P. be Rs. y. Then, $3(y - x) = (2y - x)$ $\Rightarrow$ $y = 2x$

Profit = Rs. $(y - x)$ = Rs. $(2x - x)$ = Rs. x.

$\therefore$ Profit% $= \left(\dfrac{x}{x} \times 100\right)\% = 100\%.$

30. Let S.P. = Rs. x. New S.P. = Rs. $\dfrac{x}{2}$, Loss = 30%.

So, C.P. = Rs. $\left(\dfrac{100}{70} \times \dfrac{x}{2}\right)$ = Rs. $\dfrac{5x}{7}$. Profit = Rs. $\left(x - \dfrac{5x}{7}\right)$ = Rs. $\dfrac{2x}{7}$.

$\therefore$ Profit% $= \left(\dfrac{2x}{7} \times \dfrac{7}{5x} \times 100\right)\% = 40\%.$

31. C.P. $= \dfrac{40}{100} \times$ S.P. $\Rightarrow$ S.P. $= \dfrac{5}{2}$ C.P. $= \left(\dfrac{5}{2} \times 100\right)\%$ of C.P. = 250% of C.P.

32. Let the C.P. be Rs. x. Then, $x - 15 = \dfrac{x}{16}$ $\Rightarrow$ $x - \dfrac{x}{16} = 15$ $\Rightarrow$ $\dfrac{15x}{16} = 15$ $\Rightarrow$ $x = 16$.

$\therefore$ C.P. = Rs. 16.

33. S.P. = C.P. $+ \dfrac{1}{4}$ C.P. $= \dfrac{5}{4}$ C.P.

$\therefore$ $\dfrac{5}{4}$ C.P. = 375 $\Rightarrow$ C.P. = Rs. $\left(375 \times \dfrac{4}{5}\right)$ = Rs. 300.

34. Let S.P. = Rs. 100. Then, Loss = Rs. 10, C.P. = Rs. $(100 + 10)$ = Rs. 110.

$\therefore$ Loss% $= \left(\dfrac{10}{110} \times 100\right)\% = 9\dfrac{1}{11}\%.$

35. Let S.P. = Rs. x. Then, Loss = Rs. $\dfrac{x}{3}$. C.P. = Rs. $\left(x + \dfrac{x}{3}\right)$ = Rs. $\dfrac{4x}{3}$.

$\therefore$ Loss% $= \left(\dfrac{x}{3} \times \dfrac{3}{4x} \times 100\right)\% = 25\%.$

36. Let C.P. = Rs. 100. Then, Profit = Rs. 320, S.P. = Rs. 420.
    New C.P. = 125% of Rs. 100 = Rs. 125; New S.P. = Rs. 420.
    Profit = Rs. (420 – 125) = Rs. 295.

    $\therefore$ Required percentage = $\left(\dfrac{295}{420} \times 100\right)\% = \dfrac{1475}{21}\% = 70\%$.

37. Let C.P. = Rs. x. Then, $832 - x = x - 448 \Rightarrow 2x = 1280 \Rightarrow x = 640$.

    $\therefore$ Required S.P. = 150% of Rs. 640 = Rs. $\left(\dfrac{150}{100} \times 640\right)$ = Rs. 960.

38. Let C.P. = Rs. x. Then, $900 - x = 2(x - 450) \Rightarrow 3x = 1800 \Rightarrow x = 600$.

    $\therefore$ Required S.P. = 125% of Rs. 600 = Rs. $\left(\dfrac{125}{100} \times 600\right)$ = Rs. 750.

39. Let C.P. be Rs. x.

    Then, $\dfrac{1920 - x}{x} \times 100 = \dfrac{x - 1280}{x} \times 100 \Rightarrow 1920 - x = x - 1280$

    $\Rightarrow 2x = 3200 \Rightarrow x = 1600$.

    $\therefore$ Required S.P. = 125% of Rs. 1600 = Rs. $\left(\dfrac{125}{100} \times 1600\right)$ = Rs. 2000.

40. Let C.P. be Rs. x.

    Then, $(1060 - x) = \dfrac{120}{100}(x - 950) \Rightarrow 106000 - 100x = 120x - 120 \times 950$

    $\Rightarrow 220x = 220000 \Rightarrow x = 1000$.

    $\therefore$ Desired S.P. = Rs. $\left(\dfrac{120}{100} \times 1000\right)$ = Rs. 1200.

41. Let C.P. of each pen be Re. 1. Then, C.P. of 8 pens = Rs. 8; S.P. of 8 pens = Rs. 12.

    $\therefore$ Gain % = $\left(\dfrac{4}{8} \times 100\right)\%$ = 50%.

42. Let C.P. of each article be Re. 1.
    Then, C.P. of 16 articles = Rs. 16; S.P. of 16 articles = Rs. 19.

    $\therefore$ Gain % = $\left(\dfrac{3}{16} \times 100\right)\% = 18\dfrac{3}{4}\%$.

43. Let C.P. of each article be Re. 1.
    Then, C.P. of 50 articles = Rs. 50; S.P. of 50 articles = Rs. 40.

    $\therefore$ Loss % = $\left(\dfrac{10}{50} \times 100\right)\%$ = 20%.

44. Let C.P. of each mango be Re. 1.
    C.P. of 110 mangoes = Rs. 110; S.P. of 110 mangoes = Rs. 120.

    $\therefore$ Gain % = $\left(\dfrac{10}{110} \times 100\right)\% = 9\dfrac{1}{11}\%$.

45. Let C.P. of each article be Re. 1. C.P. of x articles = Rs. x, S.P. of x articles = Rs. 20.
    Profit = Rs. $(20 - x)$.

    $\therefore$ $\dfrac{20 - x}{x} \times 100 = 25 \Rightarrow 2000 - 100x = 25x \Rightarrow 125x = 2000 \Rightarrow x = 16$.

46. Clearly, the retailer gets 1 dozen out of 6 dozens free.

    $\therefore$ Equivalent discount = $\left(\dfrac{1}{6} \times 100\right)\% = 16\dfrac{2}{3}\%$.

47. (S.P. of 18 cots) – (C.P. of 18 cots) = (C.P. of 3 cots)
    $\Rightarrow$ C.P. of 21 cots = S.P. of 18 cots = Rs. 16800
    $\Rightarrow$ C.P. of 1 cot = Rs. $\left(\dfrac{16800}{21}\right)$ = Rs. 800.

48. (S.P. of 12 notebooks) – (C.P. of 12 notebooks) = (S.P. of 4 notebooks)
    $\Rightarrow$ C.P. of 12 notebooks = S.P. of 8 notebooks.
    Let C.P. of each notebook be Re. 1.
    Then, C.P. of 8 notebooks = Rs. 8; S.P. of 8 notebooks = Rs. 12.
    $\therefore$ Gain % = $\left(\dfrac{4}{8} \times 100\right)$ % = 50%.

49. (C.P. of 17 balls) – (S.P. of 17 balls) = (C.P. of 5 balls)
    $\Rightarrow$ C.P. of 12 balls = S.P. of 17 balls = Rs. 720
    $\Rightarrow$ C.P. of 1 ball = Rs. $\left(\dfrac{720}{12}\right)$ = Rs. 60.

50. (C.P. of 36 mangoes) – (S.P. of 36 mangoes) = Loss = (S.P. of 4 mangoes)
    $\Rightarrow$ S.P. of 40 mangoes = C.P. of 36 mangoes.
    Let C.P. of each mango be Re. 1.
    C.P. of 40 mangoes = Rs. 40; S.P. of 40 mangoes = Rs. 36.
    $\therefore$ Loss % = $\left(\dfrac{4}{40} \times 100\right)$ % = 10%.

51. C.P. = Rs. (16 × 2) = 32. S.P. = Rs. (12 × 1.5 + 4 × 0.5) = Rs. (18 + 2) = Rs. 20.
    $\therefore$ Loss % = $\left(\dfrac{12}{32} \times 100\right)$ % = 37.5%.

52. C.P. of 1 apple = Rs. $\left(\dfrac{34}{8}\right)$ = Rs. 4.25. S.P. of 1 apple = Rs. $\left(\dfrac{57}{12}\right)$ = Rs. 4.75.
    Profit on each apple = Re. 0.50.
    $\therefore$ Number of apples required = $\left(\dfrac{45}{0.50}\right)$ = 90.

53. Suppose, number of oranges bought = L.C.M. of 9 and and 10 = 90.
    C.P. of 90 oranges = Rs. $\left(\dfrac{25}{10} \times 90\right)$ = Rs. 225.
    S.P. of 90 oranges = Rs. $\left(\dfrac{25}{9} \times 90\right)$ = Rs. 250.
    $\therefore$ Profit % = $\left(\dfrac{25}{225} \times 100\right)$ % = $\dfrac{100}{9}$ % = $11\dfrac{1}{9}$ %.

54. Suppose, number of articles bought = L.C.M. of 6 and 5 = 30.
    C.P. of 30 articles = Rs. $\left(\dfrac{5}{6} \times 30\right)$ = Rs. 25. S.P. of 30 articles = Rs. $\left(\dfrac{6}{5} \times 30\right)$ = Rs. 36.
    $\therefore$ Gain % = $\left(\dfrac{11}{25} \times 100\right)$ % = 44%.

55. Suppose, number of fruits bought = L.C.M. of 16 and 8 = 16.
    C.P. of 16 fruits = Rs. 24. S.P. of 16 fruits = Rs. $\left(\dfrac{18}{8} \times 16\right)$ = Rs. 36.
    $\therefore$ Profit % = $\left(\dfrac{12}{24} \times 100\right)$ % = 50%.

56. Suppose, number of pencils bought = L.C.M. of 7 and 8 = 56.

C.P. of 56 pencils = Rs. $\left(\frac{9}{7} \times 56\right)$ = Rs. 72. S.P. of 56 pencils = Rs. $\left(\frac{11}{8} \times 56\right)$ = Rs. 77.

Now, Rs. 5 are gained on 56 pencils.

So, Rs. 10 are gained on $\left(\frac{56}{5} \times 10\right)$ = 112 pencils.

57. Suppose he bought 1 dozen clips of each kind.

C.P. of 2 dozens = Rs. $\left(\frac{1}{3} \times 12 + \frac{1}{2} \times 12\right)$ = Rs. 10.

∴ S.P. of 2 dozens = 120% of Rs. 10 = Rs. $\left(\frac{120}{100} \times 10\right)$ = Rs. 12.

Hence, S.P. per dozen = Rs. 6.

58. Suppose he buys 6 eggs of each kind.

C.P. of 12 eggs = Rs. $\left(\frac{1}{2} \times 6 + \frac{2}{3} \times 6\right)$ = Rs. 7. S.P. of 12 eggs = Rs. $\left(\frac{3}{5} \times 12\right)$ = Rs. 7.20.

∴ Gain = $\left(\frac{0.20}{7} \times 100\right)$% = $2\frac{6}{7}$%.

59. C.P. of 2 dozen oranges = Rs. (10 + 8) = Rs. 18. S.P. of 2 dozen oranges = Rs. 22.
If profit is Rs. 4, oranges bought = 2 dozen.

If profit is Rs. 120, oranges bought = $\left(\frac{2}{4} \times 120\right)$ dozens = 60 dozens.

60. C.P. of 6 toffees = Re. 1. S.P. of 6 toffees = 120% of Re. 1 = Rs. $\frac{6}{5}$.

For Rs. $\frac{6}{5}$, toffees sold = 6. For Re. 1, toffees sold = $\left(6 \times \frac{5}{6}\right)$ = 5.

61. Let S.P. of 12 toffees be Rs. x. Then, 80 : 1 = 120 : x or $x = \left(\frac{120}{80}\right) = \frac{3}{2}$.

For Rs. $\frac{3}{2}$, toffees sold = 12. For Re. 1, toffees sold = $\left(12 \times \frac{2}{3}\right)$ = 8.

62. Let S.P. of 45 lemons be Rs. x. Then, 80 : 40 = 120 : x or $x = \left(\frac{120 \times 40}{80}\right)$ = 60.

For Rs. 60, lemons sold = 45. For Rs. 24, lemons sold = $\left(\frac{45}{60} \times 24\right)$ = 18.

63. C.P. of 56 kg rice = Rs. (26 × 20 + 30 × 36) = Rs. (520 + 1080) = Rs. 1600.
S.P. of 56 kg rice = Rs. (56 × 30) = Rs. 1680.

∴ Gain = $\left(\frac{80}{1600} \times 100\right)$% = 5%.

64. C.P. of 50 kg wheat = Rs. (30 × 11.50 + 20 × 14.25) = Rs. (345 + 285) = Rs. 630.

S.P. of 50 kg wheat = 130% of Rs. 630 = Rs. $\left(\frac{130}{100} \times 630\right)$ = Rs. 819.

∴ S.P. per kg = Rs. $\left(\frac{819}{50}\right)$ = Rs. 16.38 = Rs. 16.30.

65. Let the required price per kg be Rs. x. Then,

C.P. of 60 kg rice = Rs. $(30 \times 17.50 + 30 \times x)$ = Rs. $(525 + 30x)$.

S.P. of 60 kg rice = Rs. (60×18.60) = Rs. 1116.

$$\therefore \quad \frac{1116 - (525 + 30x)}{525 + 30x} \times 100 = 20 \quad \Leftrightarrow \quad \frac{591 - 30x}{525 + 30x} = \frac{1}{5}$$

$$\Leftrightarrow \quad 2955 - 150x = 525 + 30x \quad \Leftrightarrow \quad 180x = 2430 \quad \Leftrightarrow \quad x = \left(\frac{2430}{180}\right) = \left(\frac{27}{2}\right) = 13.50.$$

So, the C.P. of second lot is Rs. 13.50 per kg.

66. Suppose he bought 2 kg, 4 kg and 3 kg of the three varieties.

C.P. of 9 kg = Rs. $(2 \times 50 + 4 \times 20 + 3 \times 30)$ = Rs. 270.

S.P. of 9 kg = Rs. (9×33) = Rs. 297.

$$\therefore \quad \text{Profit\%} = \left(\frac{27}{270} \times 100\right)\% = 10\%.$$

67. Mean cost price = Rs. $\left(\frac{100}{137.5} \times 8\right)$ = Rs. $\frac{64}{11}$.

By the rule of alligation :

C.P. of 1 litre water   C.P. of 1 litre milk

0   6.40

Mean price
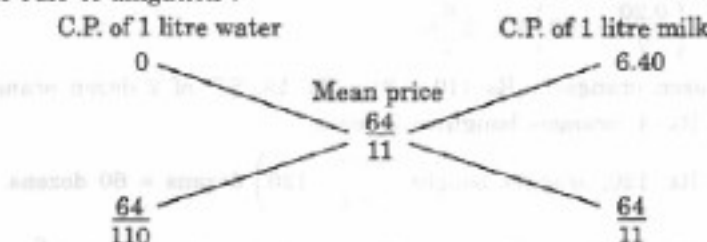
$\frac{64}{11}$

$\frac{64}{110}$ $\frac{64}{11}$

$$\therefore \quad \text{Required ratio} = \frac{64}{110} : \frac{64}{11} = 1 : 10.$$

68. Let the cost of the other brand be Rs. x per kg.

C.P. of 5 kg = Rs. $(2 \times 200 + 3 \times x)$ = Rs. $(400 + 3x)$.

S.P. of 5 kg = Rs. (5×177) = Rs. 885.

$$\therefore \quad \frac{885 - (400 + 3x)}{400 + 3x} \times 100 = 18 \quad \Leftrightarrow \quad \frac{485 - 3x}{400 + 3x} = \frac{9}{50}$$

$$\Leftrightarrow \quad 24250 - 150x = 3600 + 27x \quad \Leftrightarrow \quad 177x = 20650 \quad \Leftrightarrow \quad x = \left(\frac{350}{3}\right) = 116\frac{2}{3}.$$

So, cost of the other brand = Rs. 116.66.

69. Suppose, he must produce x items. Then, C.P. = Rs. $(40x + 300)$, S.P. = Rs. $60x$.

$$\therefore \quad 60x - (40x + 300) = 1000 \text{ or } 20x = 4000 \text{ or } x = 200.$$

70. Gain% = $\left(\frac{10}{90} \times 100\right)\%$ = $11\frac{1}{9}\%$.

71. Profit% = $\left(\frac{200}{800} \times 100\right)\%$ = 25%.

72. Let error = x gms. Then, $\dfrac{x}{1000 - x} \times 100 = 6\dfrac{18}{47} \quad \Leftrightarrow \quad \dfrac{100x}{1000 - x} = \dfrac{300}{47}$

$$\Leftrightarrow \quad 47x = 3(1000 - x) \quad \Leftrightarrow \quad 50x = 3000 \quad \Leftrightarrow \quad x = 60.$$

$$\therefore \quad \text{Weight used} = (1000 - 60) = 940 \text{ gms.}$$

73. **Rule** : Gain% = $\dfrac{(100 + \text{common gain}\%)^2}{100} - 100.$

∴ Gain% = $\left[\dfrac{(100 + 10)^2}{100} - 100\right]\% = \left(\dfrac{12100 - 10000}{100}\right)\% = 21\%.$

74. Let us consider a packet of rice marked 1 kg.

Its actual weight is 80% of 1000 gm = 800 gm.

Let C.P. of each gm be Re. 1. Then, C.P. of this packet = Rs. 800.

S.P. of this packet = 110% of C.P. of 1 kg = Rs. $\left(\dfrac{110}{100} \times 1000\right)$ = Rs. 1100.

∴ Gain% = $\left(\dfrac{300}{800} \times 100\right)\% = 37.5\%.$

75. Suppose he has 100 items. Let C.P. of each item be Re. 1.

Total cost = Rs. 100. Number of items left after theft = 80.

S.P. of each item = Rs. 1.10.

∴ Total sale = Rs. (1.10 × 80) = Rs. 88.

Hence, Loss% = $\left(\dfrac{12}{100} \times 100\right)\% = 12\%.$

76. 125% of 120% of A = 225 $\Rightarrow$ $\dfrac{125}{100} \times \dfrac{120}{100} \times A = 225$ $\Rightarrow$ A = $\left(225 \times \dfrac{2}{3}\right)$ = 150.

77. 110% of 90% of 120% of A = 1188

$\Rightarrow$ $\dfrac{110}{100} \times \dfrac{90}{100} \times \dfrac{120}{100} A = 1188$ $\Rightarrow$ $\dfrac{1188}{1000} A = 1188$ $\Rightarrow$ A = 1000.

∴ A purchased it for Rs. (1000 − 110) = Rs. 890.

78. Money spent by X = Rs. 150000.

Money received by X = 105% of Rs. 150000 = Rs. 157500.

C.P. to X = 98% of Rs. 157500 = Rs. 154350.

∴ X gains Rs. (157500 − 154350) = Rs. 3150.

79. Let the cost price for the manufacturer be Rs. x.

Then, 125% of 120% of 118% of x = 30.09.

$\Rightarrow$ $\dfrac{125}{100} \times \dfrac{120}{100} \times \dfrac{118}{100} x = \dfrac{3009}{100}$ $\Rightarrow$ $\dfrac{177}{100} x = \dfrac{3009}{100}$ $\Rightarrow$ $x = \left(\dfrac{3009}{177}\right) = 17.$

80. Let C.P. = Rs. x, Profit% = x% and S.P. = Rs. 144.

∴ $x = \left[\dfrac{100}{(100 + x)} \times 144\right]$ $\Rightarrow$ $x^2 + 100x = 14400$ $\Rightarrow$ $x^2 + 100x - 14400 = 0$

$\Rightarrow$ $x^2 + 180x - 80x - 14400 = 0$ $\Rightarrow$ $(x + 180)(x - 80) = 0$ $\Rightarrow$ $x = 80.$

81. Let S.P. be Rs. x. Then, C.P. = Rs. $\dfrac{13}{15}x$, Receipt = 112% of Rs. x = Rs. $\dfrac{28}{25}x$.

Gain = Rs. $\left(\dfrac{28x}{25} - \dfrac{13x}{15}\right)$ = Rs. $\dfrac{19x}{75}.$

∴ Gain% = $\left(\dfrac{19x}{75} \times \dfrac{15}{13x} \times 100\right)\% = \dfrac{380}{13}\% = 29\dfrac{3}{13}\%.$

82. Let the article be worth Rs. x.

    C.P. = 90% of Rs. x = Rs. $\frac{9x}{10}$; S.P. = 110% of Rs. x = Rs. $\frac{11x}{10}$.

    Gain = Rs. $\left(\frac{11x}{10} - \frac{9x}{10}\right)$ = Rs. $\frac{x}{5}$.

    $\therefore$ Gain% = $\left(\frac{x}{5} \times \frac{10}{9x} \times 100\right)\%$ = $22\frac{2}{9}\%$ > 20%.

83. Let original price = Rs. 100.

    Then C.P. = Rs. 90, S.P. = 130% of Rs. 90 = Rs. $\left(\frac{130}{100} \times 90\right)$ = Rs. 117.

    $\therefore$ Required percentage = (117 − 100)% = 17%.

84. Let C.P. be Rs. x. Then, 5% of x = (350 − 340) = 10 $\Rightarrow$ $\frac{x}{20}$ = 10 $\Rightarrow$ x = 200.

85. Let C.P. be Rs. x. Then, 2% of x = (400 − 380) = 20 $\Rightarrow$ $\frac{x}{50}$ = 20 $\Rightarrow$ x = 1000.

86. Let C.P. be Rs. x. Then, $\frac{105}{100}x - \frac{95}{100}x$ = 15 $\Rightarrow$ $\frac{10x}{100}$ = 15 $\Rightarrow$ x = 150.

87. Let C.P. be Rs. x. Then, $(106\% \text{ of } x) - \left(87\frac{1}{2}\% \text{ of } x\right)$ = 51.80

    $\Rightarrow$ $18\frac{1}{2}\%$ of x = 51.80 $\Rightarrow$ x = $\left(\frac{51.80 \times 100 \times 2}{37}\right)$ = 280.

88. Let the C.P. be Rs. x.

    Then, S.P. = 120% of Rs. x = Rs. $\left(x \times \frac{120}{100}\right)$ = Rs. $\frac{6x}{5}$.

    $\therefore$ $\frac{6x}{5} - x$ = 240 $\Leftrightarrow$ x = 1200.

    $\therefore$ S.P. = Rs. $\left(\frac{6}{5} \times 1200\right)$ = Rs. 1200.

89. Let C.P. be Rs. x. Then,

    $\left(107\frac{1}{2}\% \text{ of } x\right) - \left(97\frac{1}{2}\% \text{ of } x\right)$ = 100 $\Rightarrow$ 10% of x = 100 $\Rightarrow$ x = 1000.

    $\therefore$ Desired S.P. = $112\frac{1}{2}\%$ of Rs. 1000 = Rs. $\left(\frac{225}{2} \times \frac{1}{100} \times 1000\right)$ = Rs. 1125.

90. Let C.P. of the article be Rs. x. Then, Required ratio = $\frac{104\% \text{ of } x}{106\% \text{ of } x}$ = $\frac{104}{106}$ = $\frac{52}{53}$ = 52 : 53.

91. Loss% = $\left(\frac{\text{Common Loss and Gain\%}}{10}\right)^2\%$ = $\left(\frac{12}{10}\right)^2\%$ = $\frac{36}{25}\%$ = $1\frac{11}{25}\%$.

92. Loss% = $\left(\frac{5}{10}\right)^2\%$ = $(0.5)^2\%$ = 0.25%.

93. Total S.P. = Rs. 8000 and Total C.P. = Rs. 8000.
    S.P. of 1st commodity = Rs. 4000. Gain on it = 25%.

    $\therefore$ C.P. of 1st commodity = Rs. $\left(\frac{100}{125} \times 4000\right)$ = Rs. 3200.

C.P. of 2nd commodity = Rs. $(8000 - 3200)$ = Rs. 4800.

S.P. of 2nd commodity = Rs. 4000.

∴ Loss on 2nd commodity = $\left(\dfrac{800}{4800} \times 100\right)\%$ = $16\dfrac{2}{3}\%$.

94. Total S.P. = Rs. 2 lakh.

C.P. of house = Rs. $\left(\dfrac{100}{80} \times 1\right)$ lakh = Rs. $\dfrac{5}{4}$ lakh.

C.P. of shop = Rs. $\left(\dfrac{100}{120} \times 1\right)$ lakh = Rs. $\dfrac{5}{6}$ lakh.

Total C.P. = Rs. $\left(\dfrac{5}{4} + \dfrac{5}{6}\right)$ lakh = Rs. $\dfrac{25}{12}$ lakh.

∴ Loss = Rs. $\left(\dfrac{25}{12} - 2\right)$ lakh = Rs. $\dfrac{1}{12}$ lakh.

95. Total C.P. = Rs. (120×110) = Rs. 13200.

Total S.P = Rs. $[(30 \times 110 + 30 \times 12) + (75 \times 110 + 75 \times 14) + (15 \times 110 - 15 \times 7)]$

= Rs. 14505.

Average profit = Rs. $\left(\dfrac{14505 - 13200}{120}\right)$ = Rs. $\dfrac{1305}{120}$ = Rs. 10.875.

96. Total profit required = Rs. (42×18) = Rs. 756.

Profit on 22 sarees = Rs. $(460 + 144)$ = Rs. 604.

Profit on 20 sarees = Rs. $(756 - 604)$ = Rs. 152.

Average profit on these sarees = Rs. $\left(\dfrac{152}{20}\right)$ = Rs. 7.60.

97. C.P. of 20 dozen = Rs. (48×20) = Rs. 960.

C.P. of 8 dozen = Rs. (48×8) = Rs. 384.

C.P. of 12 dozen = Rs. $(960 - 384)$ = Rs. 576.

Total S.P. = Rs. $\left(\dfrac{110}{100} \times 384 + \dfrac{120}{100} \times 576\right)$ = Rs. 1113.60.

∴ Profit% = $\left(\dfrac{153.60}{960} \times 100\right)\%$ = 16%.

98. C.P. of $\dfrac{3}{4}$th = Rs. $\left(\dfrac{3}{4} \times 400\right)$ = Rs. 300, C.P. of $\dfrac{1}{4}$th = Rs. 100.

∴ Total S.P. = (90% of Rs. 300 + 110% of Rs. 100) = Rs. 380.

Loss = $\left(\dfrac{20}{400} \times 100\right)\%$ = 5%.

99. Let C.P. of whole be Rs. x. C.P. of $\dfrac{2}{3}$rd = Rs. $\dfrac{2x}{3}$; C.P. of $\dfrac{1}{3}$rd = Rs. $\dfrac{x}{3}$.

Total S.P. = Rs. $\left[\left(120\% \text{ of } \dfrac{2x}{3}\right) + \left(114\% \text{ of } \dfrac{x}{3}\right)\right]$ = Rs. $\left(\dfrac{4x}{5} + \dfrac{19x}{50}\right)$ = Rs. $\dfrac{59x}{50}$.

Gain = Rs. $\left(\dfrac{59x}{50} - x\right)$ = Rs. $\dfrac{9x}{50}$.

∴ Gain% = $\left(\dfrac{9x}{50} \times \dfrac{1}{x} \times 100\right)\%$ = 18%.

100. Let C.P. of whole be Rs. x. C.P. of $\frac{1}{2}$ stock = Rs. $\frac{x}{2}$, C.P. of $\frac{1}{4}$ stock = Rs. $\frac{x}{4}$.

Total S.P. = Rs. $\left[\left(120\% \text{ of } \frac{x}{2}\right) + \left(80\% \text{ of } \frac{x}{4}\right) + \frac{x}{4}\right]$ = Rs. $\left(\frac{3x}{5} + \frac{x}{5} + \frac{x}{4}\right)$ = Rs. $\frac{21x}{20}$.

Gain = Rs. $\left(\frac{21x}{20} - x\right)$ = Rs. $\frac{x}{20}$.

$\therefore$ Gain% = $\left(\frac{x}{20} \times \frac{1}{x} \times 100\right)\%$ = 5%.

101. Let C.P. of each clock be Rs. x. Then, C.P. of 90 clocks = Rs. $90x$.

$\therefore$ $[(110\% \text{ of } 40x) + (120\% \text{ of } 50x)] - (115\% \text{ of } 90x) = 40$

$\Rightarrow$ $44x + 60x - 103.5x = 40$ $\Rightarrow$ $0.5x = 40$ $\Rightarrow$ $x = 80$.

102. Let the investments be $3x$ and $5x$. Then, total investment = $8x$.

Total receipt = $(115\% \text{ of } 3x + 90\% \text{ of } 5x) = (3.45x + 4.5x) = 7.95x$.

$\therefore$ Loss = $\left(\frac{0.05x}{8x} \times 100\right)\%$ = 0.625%.

103. Let the required gain percent be $x\%$.

Then, $(110\% \text{ of } 3000) + [(100 + x)\% \text{ of } 3000] = 125\% \text{ of } 6000$

$\Rightarrow$ $\left(\frac{110}{100} \times 3000\right) + \left[\frac{(100 + x)}{100} \times 3000\right] = \frac{125}{100} \times 6000$

$\Rightarrow$ $30(100 + x) = 4200$ $\Rightarrow$ $100 + x = 140$ $\Rightarrow$ $x = 40\%$.

104. Let the quantity sold at a loss be x kg and let C.P. per kg be Re. 1.

Total C.P. = Rs. 24.

Total S.P. = Rs. $[120\% \text{ of } (24 - x) + 95\% \text{ of } x]$ = Rs. $\left[\frac{6}{5}(24 - x) + \frac{19x}{20}\right]$ = Rs. $\left(\frac{576 - 5x}{20}\right)$.

$\therefore$ $\frac{576 - 5x}{20} = 110\% \text{ of } 24$ $\Rightarrow$ $\frac{576 - 5x}{20} = \frac{264}{10}$ $\Rightarrow$ $576 - 5x = 528$

$\Rightarrow$ $5x = 48$ $\Rightarrow$ $x = 9.6$ kg.

105. Let the total value be Rs. x. Value of $\frac{2}{3}$rd = Rs. $\frac{2x}{3}$, Value of $\frac{1}{3}$rd = Rs. $\frac{x}{3}$.

Total S.P. = Rs. $\left[\left(105\% \text{ of } \frac{2x}{3}\right) + \left(98\% \text{ of } \frac{x}{3}\right)\right]$ = Rs. $\left(\frac{210x}{300} + \frac{98x}{300}\right)$ = Rs. $\frac{308x}{300}$.

$\therefore$ $\frac{308x}{300} - x = 400$ $\Rightarrow$ $\frac{8x}{300} = 400$ $\Rightarrow$ $x = \left(\frac{400 \times 300}{8}\right)$ = 15000.

106. Let C.P. of watch be Rs. x. Then, C.P. of wall clock = Rs. $(390 - x)$.

$\therefore$ $(10\% \text{ of } x) + [15\% \text{ of } (390 - x)] = 51.50$ $\Rightarrow$ $\frac{10}{100} \times x + \frac{15}{100} \times (390 - x) = \frac{515}{10}$

$\Rightarrow$ $10x + 5850 - 15x = 5150$ $\Rightarrow$ $5x = 700$ $\Rightarrow$ $x = 140$.

So, C.P. of watch = Rs. 140, C.P. of wall clock = Rs. 250.

$\therefore$ Difference = Rs. $(250 - 140)$ = Rs. 110.

107. Let C.P. of each horse be Rs. x and C.P. of each cow be Rs. y. Then,

$4x + 9y = 13400$ ...(i)

And, $10\% \text{ of } 4x + 20\% \text{ of } 9y = 1880$

$\Rightarrow$ $\frac{2}{5}x + \frac{9}{5}y = 1880$ $\Rightarrow$ $2x + 9y = 9400$ ...(ii)

Solving (i) and (ii), we get : $x = 2000$ and $y = 600$.

$\therefore$ Cost price of each horse = Rs. 2000.

108. Let C.P. of clock A be Rs. x and that of clock B be Rs. $(650 - x)$. Then,

$$120\% \text{ of } x = 75\% \text{ of } (650 - x) \implies 650 - x = \frac{120}{75}x = \frac{8}{5}x$$

$$\implies \frac{13}{5}x = 650 \implies x = \left(\frac{650 \times 5}{13}\right) = 250.$$

∴ C.P. of A = Rs. 250, C.P. of B = Rs. 400.

109. Let the C.P. of the watches be Rs. x and Rs. $(840 - x)$.

∴ $(116\% \text{ of } x) + [88\% \text{ of } (840 - x)] = 840$

$\implies 116x + 73920 - 88x = 84000 \implies 28x = 10080 \implies x = 360.$

∴ Their cost prices are Rs. 360 and Rs. 480.

110. Let C.P. of the chair be Rs. x and that of the table be Rs. y.

Then, 17% of y − 7% of x = 296 $\implies$ $17y - 7x = 29600$ ...(i)

And, 12% of y + 7% of x = 400 $\implies$ $12y + 7x = 40000$ ...(ii)

Solving (i) and (ii), we get : $y = 2400$ and $x = 1600$.

∴ C.P. of table = Rs. 2400.

111. S.P. = $97\frac{1}{2}\%$ of Rs. 650 = Rs. $\left(\frac{195}{2} \times \frac{1}{100} \times 650\right)$ = Rs. 633.75.

112. M.P. = Rs. 272000.

Discount = Rs. $[(4\% \text{ of } 200000) + (2.5\% \text{ of } 72000)]$ = Rs. $(8000 + 1800)$ = Rs. 9800.

∴ Actual price = Rs. $(272000 - 9800)$ = Rs. 262200.

113. C.P. = 90% of 80% of Rs. 1400 = Rs. $\left(\frac{90}{100} \times \frac{80}{100} \times 1400\right)$ = Rs. 1008.

114. Rate of discount = $\left(\frac{12}{80} \times 100\right)\%$ = 15%.

115. S.P. of each article = Rs. $\left(\frac{37.40}{2}\right)$ = Rs. 18.70.

Let M.P. be Rs. x.

Then, 85% of x = 18.70 $\implies$ $x = \left(\frac{18.70 \times 100}{85}\right)$ = 22.

116. Let the labelled price be Rs. x.

88% of 80% of x = 704 $\implies$ $x = \left(\frac{704 \times 100 \times 100}{88 \times 80}\right)$ = 1000.

117. S.P. after 1st discount = Rs. $\left(\frac{80}{100} \times 1500\right)$ = Rs. 1200.

Net S.P. = Rs. 1104. Discount on Rs. 1200 = Rs. 96.

∴ Required discount = $\left(\frac{96}{1200} \times 100\right)\%$ = 8%.

118. Let the costs of the two articles be x and y. Then, 15% of x = 20% of y $\implies$ $\frac{x}{y} = \frac{20}{15} = \frac{4}{3}$.

So, x and y must be in the ratio of 4 : 3.

119. Let the list price be Rs. x.

$\implies \frac{80}{100}x = 24 \implies x = \frac{24 \times 100}{80} = 30.$

∴ Required S.P. = 70% of Rs. 30 = Rs. 21.

120. Let the list price be Rs. z.

$\therefore \quad (100 - x)\%$ of $z = y \implies \left(\dfrac{100 - x}{100}\right) \times z = y \implies z = \left(\dfrac{100y}{100 - x}\right)$.

121. Let the labelled price be Rs. x. Then,

$(80\%$ of $x) - (75\%$ of $x) = 500 \implies 5\%$ of $x = 500 \implies x = \left(\dfrac{500 \times 100}{5}\right) = 10000$.

122. Let marked price be Rs. 100.

Then, Final S.P. = 70% of 80% of Rs. 100 = Rs. $\left(\dfrac{70}{100} \times \dfrac{80}{100} \times 100\right)$ = Rs. 56.

$\therefore \quad$ Single discount = $(100 - 56)\% = 44\%$.

123. Let marked price be Rs. 100.

Then, S.P. = 85% of 88% of 90% of Rs. 100 = Rs. $\left(\dfrac{85}{100} \times \dfrac{88}{100} \times \dfrac{90}{100} \times 100\right)$ = Rs. 67.32.

$\therefore \quad$ Single discount = $(100 - 67.32)\% = 32.68\%$.

124. S.P. = 90% of 80% of Rs. 2000 = Rs. $\left(\dfrac{90}{100} \times \dfrac{80}{100} \times 2000\right)$ = Rs. 1440.

125. S.P. = 95% of 95% of Rs. 80 = Rs. $\left(\dfrac{95}{100} \times \dfrac{95}{100} \times 80\right)$ = Rs. 72.20.

126. Actual price = 95% of 90% of 85% of Rs. 12000

$= $ Rs. $\left(\dfrac{95}{100} \times \dfrac{90}{100} \times \dfrac{85}{100} \times 12000\right)$ = Rs. 8721.

127. Let the original price be Rs. x. Then,

95% of 88% of $x = 209 \implies x = \left(\dfrac{209 \times 100 \times 100}{95 \times 88}\right) = 250$.

128. S.P. in 1st case = 60% of Rs. 100000 = Rs. 60000.

S.P. in 2nd case = 96% of 64% of Rs. 100000

$= $ Rs. $\left(\dfrac{96}{100} \times \dfrac{64}{100} \times 100000\right)$ = Rs. 61440.

$\therefore \quad$ Difference = Rs. $(61440 - 60000)$ = Rs. 1440.

129. Let the amount of the bill be Rs. x. Then,

$(65\%$ of $x) - (80\%$ of 80% of $x) = 22 \implies \left(\dfrac{65}{100} \times x\right) - \left(\dfrac{80}{100} \times \dfrac{80}{100} \times x\right) = 22$

$\implies \dfrac{65}{100}x - \dfrac{64}{100}x = 22 \implies \dfrac{x}{100} = 22 \implies x = 2200$.

130. S.P. in 1st case = 94% of 70% of Rs. 700 = Rs. $\left(\dfrac{94}{100} \times \dfrac{70}{100} \times 700\right)$ = Rs. 460.60.

S.P. in 2nd case = 84% of 80% of Rs. 700 = Rs. $\left(\dfrac{84}{100} \times \dfrac{80}{100} \times 700\right)$ = Rs. 470.40.

$\therefore \quad$ Difference = Rs. $(470.40 - 460.60)$ = Rs. 9.80.

131. Let the second discount rate be $x\%$. Then,

$(100 - x)\%$ of 90% of 720 = 550.80

$\implies \dfrac{(100 - x)}{100} \times \dfrac{90}{100} \times 720 = 550.80 \implies (100 - x) = \left(\dfrac{55080}{9 \times 72}\right) = 85 \implies x = 15$.

$\therefore \quad$ Second discount rate = 15%.

132. Cost of each calculator $= Rs. \left(250 + \frac{2500}{150}\right) = Rs. 266\frac{2}{3}$.

S.P. of each calculator $= Rs. \left(\frac{95}{100} \times 320\right) = Rs. 304$.

$\therefore$ Profit% $= \left(\frac{112}{3} \times \frac{3}{800} \times 100\right)\% = 14\%$.

133. Let C.P. be Rs. 100. Then, marked price = Rs. 125.

S.P. = 84% of Rs. 125 = Rs. $\left(\frac{84}{100} \times 125\right)$ = Rs. 105.

$\therefore$ Profit% = (105 − 100)% = 5%.

134. Let C.P. be Rs. 100. Then, marked price = Rs. 130.

S.P. $= \left(100 - \frac{25}{4}\right)\%$ of Rs. 130 = Rs. $\left(\frac{375}{400} \times 130\right)$ = Rs. 121.875.

$\therefore$ Profit% = (121.875 − 100)% = 21.875% $= \frac{21875}{1000}\% = 21\frac{7}{8}\%$.

135. Let the original price be Rs. 100. Then, marked price = Rs. 130.

Final price − 90% of 90% of Rs. 130 = Rs. $\left(\frac{90}{100} \times \frac{90}{100} \times 130\right)$ = Rs. 105.30.

$\therefore$ Increase in price = (105.30 − 100)% = 5.3%.

136. Let the marked price of each article be Re. 1.
Then, C.P. of 30 = Rs. 27, S.P. of 30 = Rs. 30.

$\therefore$ Gain% $= \left(\frac{3}{27} \times 100\right)\% = 11\frac{1}{9}\%$.

137. Marked price − Rs. 300. C.P. − Rs. $\left(\frac{100}{120} \times 300\right)$ − Rs. 250.

Sale price = 90% of Rs. 300 = Rs. 270.

$\therefore$ Required gain% $= \left(\frac{20}{250} \times 100\right)\% = 8\%$.

138. Let marked price = Rs. 100. Then, C.P. = Rs. 64. S.P = Rs. 88.

$\therefore$ Gain% $= \left(\frac{24}{64} \times 100\right)\% = 37.5\%$.

139. Let the marked price be Rs. x. Then, 108% of 90% of x = 680.40

$\Rightarrow \frac{108}{100} \times \frac{90}{100} x = 680.40 \Rightarrow x = \left(\frac{68040 \times 100}{108 \times 90}\right) = Rs. 700$.

140. Let C.P. = Rs. 100. Then, S.P. = Rs. 120.

Let marked price be Rs. x. Then, 90% of x = 120 $\Rightarrow x = \left(\frac{120 \times 100}{90}\right) = 133\frac{1}{3}$.

$\therefore$ Marked price − $33\frac{1}{3}\%$ above C.P.

141. C.P. = Rs. 1200. S.P. = 125% of Rs. 1200 = Rs. $\left(\frac{125}{100} \times 1200\right)$ = Rs. 1500.

Let marked price be Rs. x. Then, 80% of x = 1500 $\Rightarrow x = \left(\frac{1500 \times 100}{80}\right) = 1875$.

$\therefore$ Marked price = Rs. 1875.

142. Let cost price be Rs. 100. The, S.P. = Rs. 112.
Let printed price be Rs. x.

$$90\% \text{ of } x = 112 \implies x = \left(\frac{112 \times 100}{90}\right) = \text{Rs. } \frac{1120}{9}.$$

∴ Required ratio = $100 : \frac{1120}{9} = 900 : 1120 = 45 : 56.$

143. Let cost price = Rs. 100. Then,

$\frac{2}{5}$ of (Marked Price) = 75 $\implies$ Marked Price = Rs. $\left(\frac{75 \times 5}{2}\right)$ = Rs. $\frac{375}{2}$.

∴ Required ratio = $\frac{375}{2} : 100 = 375 : 200 = 15 : 8.$

144. Let the C.P. of each article be Rs. 100.
Then, C.P. of 16 articles = Rs. (100×16) = Rs. 1600.

S.P. of 15 articles = Rs. $\left(1600 \times \frac{135}{100}\right)$ = Rs. 2160.

S.P. of each article = Rs. $\frac{2160}{15}$ = Rs. 144.

If S.P. is Rs. 96, marked price = Rs. 100.

If S.P. is Rs. 144, marked price = Rs. $\left(\frac{100}{96} \times 144\right)$ = Rs. 150.

∴ Marked price = 50% above C.P.

145. Let C.P. = Rs. 100. Then, Marked Price = Rs. 110, S.P. = Rs. 99.

∴ Discount % = $\left(\frac{11}{110} \times 100\right)\% = 10\%.$

146. Let C.P. = Rs. 100. Then, Marked Price = Rs. 135, S.P. = Rs. 108.

∴ Discount % = $\left(\frac{27}{135} \times 100\right)\% = 20\%.$

147. Let C.P. of whole stock = Rs. 100. Then, Marked Price of whole stock = Rs. 120.

M.P. of $\frac{1}{2}$ stock = Rs. 60, M.P. of $\frac{1}{4}$ stock = Rs. 30.

∴ Total S.P. = Rs. $[60 + (80\% \text{ of } 30) + (60\% \text{ of } 30)]$ = Rs. $(60 + 24 + 18)$ = Rs. 102.
Hence, gain% = $(102 - 100)\% = 2\%.$

148. Since the marked price is not given, so the cost price cannot be determined.

149. S.P. = 95% of Rs. 6500 = Rs. $\left(\frac{95}{100} \times 6500\right)$ = Rs. 6175.

Profit = 15%.

∴ C.P. = Rs. $\left(\frac{110}{115} \times 6175\right)$ = Rs. 5369.56 ≈ Rs. 5350.

150. Let the labelled price be Rs. x. Then, 120% of x = 2880 $\implies$ $x = \left(\frac{2880 \times 100}{120}\right)$ = 2400.

∴ C.P. = 85% of Rs. 2400 = Rs. $\left(\frac{85}{100} \times 2400\right)$ = Rs. 2040.

151. Marked price = Rs. 30. S.P. = Rs. $\left[\left(\dfrac{85}{100} \times 30\right) - 1.50\right]$ = Rs. $(25.50 - 1.50)$ = Rs. 24.

Let C.P. be Rs. x. Then, 120% of $x = 24$ ⟹ $x = \left(\dfrac{24 \times 100}{120}\right)$ = Rs. 20.

152. Let the marked price be Rs. 100.

Then, S.P. = Rs. $\left(\dfrac{90}{100} \times 100\right)$ = Rs. 90. Gain = 20%.

∴   C.P. = Rs. $\left(\dfrac{100}{120} \times 90\right)$ = Rs. 75.

New commission = Rs. 20; New S.P. = Rs. 80.

∴   New Profit = $\left(\dfrac{5}{75} \times 100\right)\%$ = $6\dfrac{2}{3}\%$.

153. S.P. = Rs. 17940. Let marked price be Rs. x.

Then, $\dfrac{92}{100}x = 17940$ ⟹ x = Rs. $\left(17940 \times \dfrac{100}{92}\right)$ = Rs. 19500.

C.P. = Rs. $\left(\dfrac{100}{119.6} \times 17940\right)$ = Rs. $\left(\dfrac{1000}{1196} \times 17940\right)$ = Rs. 15000.

Now C.P. = Rs. 15000, S.P. = Rs. 19500.

∴   Required profit% = $\left(\dfrac{4500}{15000} \times 100\right)\%$ = 30%.

154. S.P. of 1 article = Rs. 45. Let marked price of each article be Rs. x.

Then, $\dfrac{90}{100}x = 45$ ⟹ x = Rs. $\left(\dfrac{45 \times 100}{90}\right)$ = Rs. 50.

C.P. = Rs. $\left(\dfrac{100}{150} \times 45\right)$ = Rs. 30.

Now, C.P. = Rs. 30, S.P. = Rs. 50.

∴   Required profit% = $\left(\dfrac{20}{30} \times 100\right)\%$ = $66\dfrac{2}{3}\%$.

155. S.P. of 1 saree = Rs. 266. Let the labelled price of each saree be Rs. x.

Then, $\dfrac{95}{100}x = 266$ ⟹ x = Rs. $\left(\dfrac{266 \times 100}{95}\right)$ = Rs. 280.

Now, S.P. = Rs. 280, Profit = 12%.

∴   C.P. of 1 saree = Rs. $\left(\dfrac{100}{112} \times 280\right)$ = Rs. 250.

156. C.P. = Rs. 320. Profit = 15%.

S.P. = Rs. $\left(\dfrac{115}{100} \times 320\right)$ = Rs. 368. Marked price = Rs. $(368 + 32)$ = Rs. 400.

∴   Required profit% = $\left(\dfrac{80}{320} \times 100\right)\%$ = 25%.

157. Let C.P. be Rs. 100. Then, S.P. = Rs. 123.50.

Let marked price be Rs. x. Then, $\dfrac{95}{100}x = 123.50$ ⟹ x = Rs. $\left(\dfrac{12350}{95}\right)$ = Rs. 130.

Now, S.P. = Rs. 130, C.P. = Rs. 100.

∴   Profit% = 30%.

158. Let original list price = Rs. 100. Then, C.P. = Rs. 75. Desired S.P. = Rs 125.

∴ Required percentage = $\left(\frac{50}{75} \times 100\right)\% = 66.67\%$.

159. Let the original price be Rs. 100. Then, C.P. = Rs. 80.

S.P. = 140% of Rs. 80 = Rs. $\left(\frac{140}{100} \times 80\right)$ = Rs. 112.

∴ Required percentage = (112 − 100)% = 12%.

160. C.P. = Rs. $\left(\frac{100}{125} \times 8750\right)$ = Rs. 7000. Let the labelled price be Rs. x.

Then, $\frac{70}{100} x = 7000 \Rightarrow x = $ Rs. $\left(\frac{7000 \times 100}{70}\right) = $ Rs. 10000.

EXERCISE 11B

(DATA SUFFICIENCY TYPE QUESTIONS)

1. A shopkeeper sells some toys at Rs. 250 each. What percent profit does he make ?
   To find the answer, which of the following information given in Statements I and II is / are necessary ?

   I. Number of toys sold.　　　　II. Cost price of each toy.
   (a) Only I is necessary.　　　　(b) Only II is necessary.
   (c) Both I and II are necessary.　(d) Either I or II is necessary.
   (e) None of these

2. A shopkeeper sells some articles at the profit of 25% on the original price. What is the exact amount of profit ?
   To find the answer, which of the following information given in Statements I and II is / are necessary ?

   I. Sale price of the article.　　II. Number of articles sold.
   (a) Only I is necessary.　　　　(b) Only II is necessary.
   (c) Either I or II is necessary.　(d) Both I and II are necessary.
   (e) None of these

Directions (Questions 3 to 13) : Each of the questions given below consists of a statement and / or a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statement(s) is / are sufficient to answer the question. Read both the statements and

Give answer (a) if the data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question;

Give answer (b) if the data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question;

Give answer (c) if the data either in Statement I or in Statement II alone are sufficient to answer the question;

Give answer (d) if the data even in both Statements I and II together are not sufficient to answer the question;

Give answer (e) if the data in both Statements I and II together are necessary to answer the question.

3. By selling a product with 20% profit, how much profit was earned ?
   I. The difference between cost and selling price is Rs. 40.
   II. The selling price is 120 percent of the cost price.　　(S.B.I.P.O. 2003)

4. What is the cost price of the article ?

    I. The profit earned on the article is one-third of the cost price.

    II. The article is sold for Rs. 400.

5. What would have been the selling price per kg of rice?   (Bank P.O. 1999)

    I. 50 kg of rice was purchased for Rs. 3350 and Rs. 150 were spent on transport.

    II. Profit earned was 5%.

6. How much was the loss ?

    I. The cost is Rs. 300.

    II. The loss is 25% of the selling price.

7. A man mixes two types of rice (X and Y) and sells the mixture at the rate of Rs. 17 per kg. Find his profit percentage.   (M.B.A. 2002)

    I. The rate of X is Rs. 20 per kg.

    II. The rate of Y is Rs. 13 per kg.

8. What is the percent profit earned by selling the product ?   (Bank P.O. 2003)

    I. The profit earned was Rs. 50.

    II. Had it been sold for Rs. 310, the profit would have been Rs. 70.

9. What is the cost price of the cassette ?

    I. The percent profit made when the cassette is sold for Rs. 78 is twice as much as when it is sold for Rs. 69.

    II. If the price of the cassette is marked at 20% above the cost price and a discount of 10% is offered on the marked price, the seller gains 8%.

10. What was the cost price of the suitcase purchased by Richard ?   (Bank P.O. 2002)

    I. Richard got 20% concession on the labelled price.

    II. Richard sold the suitcase for Rs. 2000 with 25% profit on the labelled price.

11. By selling a product for Rs. 100, how much profit was earned ?   (Bank P.O. 2002)

    I. 20% profit would have been earned if it were sold for Rs. 90.

    II. The profit was one-third of the purchase price.

12. What is the price of a banana ?

    I. A man can buy 14 bananas and 35 oranges for Rs. 84.

    II. With 50% discount on the price of bananas, Rs. 12 would buy 4 bananas and 5 oranges.

13. How much profit did Anand make by selling a bed ?   (S.B.I.P.O. 1995)

    I. He bought the bed with 40% discount on labelled price.

    II. He sold it with 20% profit on the labelled price.

Directions (Questions 14 to 20) : Each of the following questions consists of a question followed by three statements I, II and III. You have to study the question and the statements and decide which of the statement(s) is/are necessary to answer the question.

14. How many articles were sold ?   (Bank P.O. 2002)

    I. Total profit earned was Rs. 1596.

    II. Cost price per article was Rs. 632.

    III. Selling price per article was Rs. 765.

    (a) Any two of the three   (b) I and II only

    (c) II and III only   (d) All I, II and III

    (e) Question cannot be answered even with the information in all the three statements.

15. What was the amount of profit earned ? **(Bank P.O. 2003)**
    I. 10% discount was offered on the labelled price.
    II. Had there been no discount, profit would have been 30%.
    III. Selling price was more than the cost price by 20%.
    (a) All I, II and III   (b) Any two of the three
    (c) III, and either I or II   (d) I, and either II or III
    (e) Question cannot be answered even with the information in all the three statements.

16. What was the cost price of the watch ?
    I. The shopkeeper labelled the price of the watch 20% above the cost price.
    II. After allowing a discount of 15% on the labelled price, the shopkeeper charges Rs. 408 for the watch.
    III. Had there been no discount, the shopkeeper would have earned 20% profit.
    (a) I, and either II or III   (b) II, and either I or III
    (c) III, and either I or II   (d) I and II only
    (e) Any two of the three

17. How much profit did Manick earn on the cost price of an article by selling it ?
    I. He got 15% discount on the marked price at the time of purchase.
    II. He sold it for Rs. 3060.
    III. He earned 2% profit on the marked price. **(S.B.I.P.O. 2000)**
    (a) I and II only   (b) II and III only
    (c) I only or II and III together   (d) All I, II and III
    (e) Even I, II and III together are not sufficient to answer the question.

18. By selling an article what is the profit percent gained ? **(S.B.I.P.O. 2002)**
    I. 5% discount is given on list price.
    II. If discount is not given, 20% profit is gained.
    III. The cost price of the article is Rs. 5000.
    (a) Only I and II   (b) Only II and III   (c) Only I and III
    (d) All I, II and III   (e) None of these

19. An item costing Rs. 3000 is sold at a certain discount. Find the rate of discount offered.
    I. The profit earned after discount is 5%.
    II. Had the discount rate been doubled, the seller incurs a loss of 15%.
    III. The item is marked at a price 25% above the cost price.
    (a) Only I and II   (b) Only II and III   (c) Only I and III
    (d) All I, II and III   (e) Any two of the three

20. What was the percentage of discount given ? **(R.B.I. 2003)**
    I. 23.5% profit was earned by selling an almirah for Rs. 12,350.
    II. If there were no discount, the earned profit would have been 30%.
    III. The cost price of the almirah was Rs. 10,000.
    (a) Only I and II   (b) Only II and III   (c) Only I and III
    (d) Any two of the three   (e) None of these

Directions (Questions 21 to 22) : *Each of these questions is followed by three statements. You have to study the question and all the three statements given to decide whether any information provided in the statement(s) is/are redundant and can be dispensed with while answering the given question.*

21. What is the percent profit earned by the shopkeeper on selling the articles in his shop ?
    I. Labelled price of the articles sold was 130% of the cost price.
    II. Cost price of each article was Rs. 550.
    III. A discount of 10% on labelled price was offered. **(S.B.I.P.O. 2001)**

(a) Only I   (b) Only II
(c) Only III   (d) All the three are required
(e) Question cannot be answered even with information in all the three statements.

22. What is the marked price of the suitcase ?
   I. When a discount of 15% is offered, the profit earned is 10.5%.
   II. The cost price of the suitcase is Rs. 1500.
   III. The marked price is 30% above the cost price.
   (a) I only   (b) Either I or III   (c) Any one of the three
   (d) All I, II and III are required   (e) None of these

ANSWERS

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

SOLUTIONS

1. S.P. = Rs. 250 each. To find gain percent, we must know the C.P. of each.
    ∴ Correct answer is (b).

2. Gain = 25% of C.P.
    In order to find gain, we must know the sale price of each article and the number of articles sold.
    ∴ Correct answer is (d).

3. Gain = 20%
    I. Profit = (S.P.) − (C.P.) = Rs. 40.
    Thus, I gives the answer. But, II does not give the answer.
    ∴ Correct answer is (a).

4. I. Gain = $\frac{1}{3}$ (C.P.).
    II. S.P. = Rs. 400.
    Gain = (S.P.) − (C.P.) ⟹ $\frac{1}{3}$ (C.P.) = (Rs. 400) − (C.P.) ⟹ $\left(1+\frac{1}{3}\right)$ (C.P.) = Rs. 400
    ⟹ C.P. = Rs. $\left(400\times\frac{3}{4}\right)$ = Rs. 300.
    Thus, I and II both are needed to get the answer.
    ∴ Correct answer is (e).

5. I. Total C.P. of 50 kg = Rs. (3350 + 150) = Rs. 3500.
    ∴ C.P. of 1 kg = Rs. $\left(\frac{3500}{50}\right)$ = Rs. 70.
    II. Gain = 5%.
    ∴ S.P. of 1 kg = 105% of Rs. 70 = Rs. $\left(70\times\frac{105}{100}\right)$ = Rs. 73.50.
    Thus, both I and II are needed to get the answer.
    ∴ Correct answer is (c).

6.   I. C.P. = Rs. 300.
     II. Loss = 25% of S.P.

     Let S.P. be Rs. x. Then, loss = 25% of Rs. x = Rs. $\frac{x}{4}$.

     Loss = (C.P.) − (S.P.) $\Rightarrow \frac{x}{4} = 300 - x \Rightarrow \left(x + \frac{x}{4}\right) = 300$

     $\Rightarrow x = \left(300 \times \frac{4}{5}\right) = 240$.

     $\therefore$ Loss = 25% of Rs. 240 = Rs. $\left(\frac{25}{100} \times 240\right)$ = Rs. 60.

     Thus, I and II are required to get the answer.
     $\therefore$ Correct answer is (e).

7.   The ratio in which X and Y are mixed, is not given.
     So, both I and II together cannot give the answer.
     $\therefore$ Correct answer is (d).

8.   II gives, S.P. = Rs. 310 and gain = Rs. 70.
     $\therefore$ C.P = Rs. (310 − 70) = Rs. 240.

     $\therefore$ Gain% = $\left(\frac{70}{240} \times 310\right)$%.

     Thus, II alone gives the answer.
     Clearly, I alone does not give the answer.
     $\therefore$ Correct answer is (b).

9.   Let the C.P. be Rs. x. Then,

     I. $\frac{(78 - x)}{x} \times 100 = 2 \times \frac{(69 - x)}{x} \times 100 \Leftrightarrow 78 - x = 138 - 2x \Leftrightarrow x = 60$.

     Thus, I only gives the answer.

     II. Let the C.P. be Rs. x. Then, M.P. = Rs. $\left(\frac{120}{100} \times x\right)$ = Rs. $\frac{6x}{5}$.

     $\therefore$ S.P. = 90% of Rs. $\frac{6x}{5}$ = Rs. $\left(\frac{6x}{5} \times \frac{90}{100}\right)$ = Rs. $\frac{27x}{25}$.

     Thus, 108% of $x = \frac{27x}{25}$. This does not give x.

     $\therefore$ II does not give the answer.
     $\therefore$ Correct answer is (a).

10. Let the labelled price be Rs. x.

     I. C.P. = 80% of Rs. x = Rs. $\left(x \times \frac{80}{100}\right)$ = Rs. $\frac{4x}{5}$.

     II. S.P. = Rs. 2000, S.P. = 125% of Rs. x = Rs. $\left(\frac{125}{100} \times x\right)$ = Rs. $\frac{5x}{4}$.

     $\therefore$ $\frac{5x}{4} = 2000 \Rightarrow x = \frac{2000 \times 4}{5} = 1600$.

     $\therefore$ C.P. = Rs. $\frac{4x}{5}$ = Rs. $\left(\frac{4}{5} \times 1600\right)$ = Rs. 1280.

     Thus, I and II together give the answer.
     $\therefore$ Correct answer is (e).

11. S.P. = Rs. 100.

I. When S.P. = Rs. 90, Gain = 20%.

$\therefore$ C.P. = Rs. $\left(\dfrac{100}{120} \times 90\right)$ = Rs. 75.

Now, (C.P. = Rs. 75 and S.P. = Rs. 100) $\Rightarrow$ Profit = Rs. 25.

Thus, I alone gives the answer.

II. Let the C.P. be Rs. x. Then, gain = Rs. $\dfrac{x}{3}$.

$\therefore$ S.P. = Rs. $\left(x + \dfrac{x}{3}\right)$ = Rs. $\dfrac{4x}{3}$.

Thus, $\dfrac{4x}{3} = 100 \Rightarrow x = \left(\dfrac{3 \times 100}{4}\right) = 75$ and so C.P. = Rs. 75.

Thus, II alone gives the answer.

$\therefore$ Correct answer is (c).

12. Let the price of a banana be Rs. x and that of an orange Rs. y.

I. $14x + 35y = 84 \Rightarrow 2x + 5y = 12$ ...(i)

II. $4 \times \dfrac{x}{2} + 5y = 12 \Rightarrow 2x + 5y = 12$ ...(ii)

Thus, even I and II together do not give the answer.

$\therefore$ Correct answer is (d).

13. I. Let the labelled price be Rs. x.

C.P. = 60% of Rs. x = Rs. $\left(x \times \dfrac{60}{100}\right)$ = Rs. $\dfrac{3x}{5}$.

II. S.P. = 120% of Rs. x = Rs. $\left(x \times \dfrac{120}{100}\right)$ = Rs. $\dfrac{6x}{5}$.

Profit = Rs. $\left(\dfrac{6x}{5} - \dfrac{3x}{5}\right)$ = Rs. $\dfrac{3x}{5}$.

Thus, even I and II together do not give the answer.

$\therefore$ Correct answer is (d).

14. I. Total gain = Rs. 1596.

II. C.P. of each article = Rs. 632.

III. S.P. of each article = Rs. 765.

Let the number of articles be x.

Then, $765x - 632x = 1596 \Rightarrow x = \dfrac{1596}{133} = 12$.

Thus, all I, II and III are needed to get the answer.

$\therefore$ Correct answer is (d).

15. Let the M.P. be Rs. x.

I. S.P. = 90% of Rs. x = Rs. $\left(x \times \dfrac{90}{100}\right)$ = Rs. $\dfrac{9x}{10}$.

II. If S.P. = Rs. x, then gain = 30%.

$\therefore$ C.P. = Rs. $\left(\dfrac{100}{130} \times x\right)$ = Rs. $\dfrac{10x}{13}$.

III. Gain = 20%.

Thus, I, II, III do not give the answer.

$\therefore$ Correct answer is (e).

16.   I. Let the C.P. be Rs. x.

   Then, M.P. = 120% of Rs. x = Rs. $\left(\dfrac{120}{100} \times x\right)$ = Rs. $\dfrac{6x}{5}$.

   II. S.P. = 85% of M.P. = Rs. $\left(\dfrac{6x}{5} \times \dfrac{85}{100}\right)$ = Rs. $\dfrac{51x}{50}$.

   $\therefore \quad \dfrac{51x}{50} = 408 \implies x = \left(408 \times \dfrac{50}{51}\right) \implies x = 400$.

   Thus, I and II give the answer.

   III. When there is no discount, then S.P. = M.P. = Rs. $\dfrac{6x}{5}$ [From I]

   Thus, II and III give the same answer.

   $\therefore$ Correct answer is (b).

17.   Let the M.P. be Rs. x.

   I. C.P. = 85% of Rs. x = Rs. $\left(x \times \dfrac{85}{100}\right)$ = Rs. $\dfrac{17x}{20}$.

   II. S.P. = Rs. 3060.

   III. 102% of x = 3060 $\implies$ $x = \left(3060 \times \dfrac{100}{102}\right)$ = 3000.

   $\therefore$ C.P. = Rs. $\dfrac{17x}{20}$ = Rs. $\left(\dfrac{17}{20} \times 3000\right)$ = Rs. 2550.

   So, gain = Rs. $(3060 - 2550)$ = Rs. 510.

   Thus all I, II and III give the answer.

   $\therefore$ Correct answer is (d).

18.   I. Let the list price be Rs. x.

   Then, S.P. = 95% of Rs. x = Rs. $\left(x \times \dfrac{95}{100}\right)$ = Rs. $\dfrac{19x}{20}$.

   II. When S.P. = Rs. x and gain = 20%.

   Then, C.P. = Rs. $\left(\dfrac{100}{120} \times x\right)$ = Rs. $\dfrac{5x}{6}$.

   $\therefore$ Gain = $\left(\dfrac{19x}{20} - \dfrac{5x}{6}\right) = \left(\dfrac{57x - 50x}{60}\right) = \dfrac{7x}{60}$.

   $\therefore$ Gain% = $\left(\dfrac{7x}{60} \times \dfrac{6}{5x} \times 100\right)\% = 14\%$.

   Thus, I and II only give the answer.

   $\therefore$ Correct answer is (a).

19.   C.P. = Rs. 3000. Let the rate of discount be x%.

   I. S.P. = 105% of Rs. 3000 = Rs. 3150.

   II. Let M.P. = Rs. x. Then, $\dfrac{(x - 3150)}{(x - 85\% \text{ of } 3000)} = \dfrac{1}{2} \implies x = 3750$.

   From I and II, discount = Rs. $(3750 - 3150)$ = Rs. 600.

   Discount% = $\left(\dfrac{600}{3750} \times 100\right)\% = 16\%$.

   Thus, I and II give the answer.

III. M.P. = 125% of Rs. 3000 = Rs. 3750.

From I and III, discount = (M.P.) − (S.P.) = Rs. 600.

Thus, Discount% can be calculated.

Thus, I and III give the answer.

From II and III, we get : discount = Rs. $\left(\dfrac{3750 - 85\% \text{ of } 3000}{2} \right)$ = Rs. 600.

Thus, II and III give the answer.

∴ Correct answer is (e).

20.   I. S.P. = Rs. 12350, Gain = 23.5%.

∴   C.P. = Rs. $\left(\dfrac{100}{123.5} \times 12350 \right)$ = Rs. 10000.

II. M.P. = 130% of C.P. = 130% of Rs. 10000 = Rs. 13000.

From I and II, discount = Rs. (13000 − 12350) = Rs. 650.

Discount% = $\left(\dfrac{650}{13000} \times 100 \right)$% = 5%.

Thus, I and II give the answer.

III gives C.P. = Rs. 10000.

So, II and III give the answer.

∴ Correct answer is (e).

21.   I. Let C.P. be Rs. x. Then, M.P. = 130% of x = Rs. $\dfrac{13x}{10}$.

III. S.P. = 90% of M.P.

Thus, I and III give, S.P. = Rs. $\left(\dfrac{90}{100} \times \dfrac{13x}{10} \right)$ = Rs. $\dfrac{117x}{100}$.

Gain = Rs. $\left(\dfrac{117x}{100} - x \right)$ = Rs. $\dfrac{17x}{100}$.

Thus, from I and III, gain% can be obtained.

Clearly, II is redundant.

∴ Correct answer is (b).

22.   II. C.P. = Rs. 1500.

I. Gain = 10.5%.

∴ From I and II, we get

S.P. = 110.5% of C.P. = Rs. $\left(\dfrac{110.5}{100} \times 1500 \right)$ = Rs. 1657.50.

Discount = 15%.

∴ M.P. = Rs. $\left(\dfrac{100}{85} \times 1657.50 \right)$ = Rs. 1950.

Thus, I and II give the answer and so III is redundant.

III. M.P. = 130% of C.P.

From II and III, we get : M.P. = Rs. $\left(\dfrac{130}{100} \times 1500 \right)$ = Rs. 1950.

∴   II and III give the answer and so I is redundant.

So, either I or III is redundant.

∴   Correct answer is (b).