**EXERCISE**

1. If the manufacture 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 `1265?
   (a) `800    (b) `1000
   (c) `900    (d) `600

2. 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.
   (a) 20%    (b) 10%
   (c) 25%    (d) No gain or loss

3. A man sold his book for `891, thereby gaining \(\frac{1}{10}\) of its cost price. Find his cost price.
   (a) `850    (b) `810
   (c) `851    (d) `840

4. A trader wants 10% profit on the selling price of a product whereas his expenses amount to 15% on sales. What should be his rate of mark up on an article costing `9?
   (a) 20%    (b) \(6\frac{2}{3}\%\)
   (c) 30%    (d) \(10\frac{10}{3}\%\)

5. If 11 lichchus are bought for 10 paise and 10 lichchus are sold for 11 paise, the gain % is
   (a) 10%    (b) 11%
   (c) 20%    (d) 21%

6. A man sold 10 eggs for 5 rupees and gained 20%. How many eggs did he buy for 5 rupees?
   (a) 10eggs    (b) 12 eggs
   (c) 14 eggs    (d) 16 eggs

7. A person sells 36 oranges per rupee and suffers a loss of 4%. Find how many oranges per rupee to be sold to have a gain of 8%?
   (a) 30    (b) 31
   (c) 32    (d) 33

8. Coconuts were purchased at ` per hundred and sold at `2 per coconut. If 2000 coconuts were sold, what was the total profit made?
   (a) `500    (b) `1000
   (c) `1500    (d) `2000

9. A shopkeeper is price is 50% above the cost price. If he allows his customer a discount 30% what profit dose he make?
   (a) 5%    (b) 10%
   (c) 15%    (d) 20%

10. A shopkeeper purchases 10kg of rice at `600 and sells at a loss as much the selling price of 2kg of rice. Find the sale rate of rice/kg.
    (a) `60 per kg    (b) `50 per kg
    (c) `80 per kg    (d) `70 per kg

11. A businessman allows a discount of 10% on the written price. How much above the cost price must he mark his goods to make a profit of 17%?
    (a) 30%    (b) 20%
    (c) 27%    (d) 18%

12. A man sold an article at a loss of 20%. If he sells the article for `12 more, he would have gained 10%. The cost price of the article is
    (a) `60    (b) `40
    (c) `30    (d) `22

13. A milk man makes a profit of 20% on the sale of milk. If he were to add 10% water to the milk, by what % would his profit increase?
    (a) 30      (b) \(\frac{40}{3}\%\)
    (c) 22      (d) 10

14. A grocer purchased 80 kg of sugar at `13.50 per kg and mixed it with 120 kg sugar at `16 per kg. At what rate should he sell the mixture to gain 16%?
    (a) `17 per kg    (b) `17.40 kg
    (c) `16.5 kg    (d) `16 per kg
15. A dishonest fruit seller professes to sell his goods at the cost price but weights 800 grams for a kg weight. Find his gain percent.
   (a) 100%   (b) 150%
   (c) 50%   (d) 200%

16. A shopkeeper purchased 150 identical pieces of calculators at the rate of `250 each. He spent an amount of `2500 on transport and packing. He fixed the labelled price of each calculator at `320. However, he decided to give a discount of 5% on the labelled price. What is the percentage profit earned by him?
   (a) 14%   (b) 15%
   (c) 16%   (d) 20%

17. A dishonest dealer sells his goods at the cost price but still earns a profit of 25% by underweighing. What weight does he use for a kg?
   (a) 750g   (b) 800g
   (c) 825g   (d) 850g

18. A shopkeeper marks up his goods to gain 35%. But he allows 10% discount for cash payment. His profit on the cash transaction therefore, in percentage, is
   (a) $13\frac{1}{2}$%   (b) 25%
   (c) $21\frac{1}{2}$%   (d) $31\frac{1}{2}$%

19. A man sold two steel chairs for `500 each. On one he gains 20% and on other, he loses 12%. How much does he gain or lose in the whole transaction?
   (a) 1.5% gain   (b) 2% gain
   (c) 1.55% gain   (d) 2% loss

20. A firm of readymade garments makes both men’s and women’s shirts. Its average profit is 6% of the sales. Its profit in men’s shirts average 8% of the sales and women’s shirts comprise 60% of the output. The average profit per sale rupee in women shirts is
   (a) 0.0466   (b) 0.0666
   (c) 0.0166   (d) None of these

21. A man purchases two watches at `600. He sells one at 15% profit and other at 10% loss. Then he neither gains nor loss. Find the cost price of each watch.
   (a) `224, `300   (b) `200, `300
   (c) `224, `336   (d) `200, `336

22. A man bought a horse and a carriage for `3000. He sold the horse at a gain of 20% and the carriage at a loss 10%, thereby gaining 2% on the whole. Find the cost of the horse.
   (a) `1000   (b) `1200
   (c) `1500   (d) `1700

23. Two electronic musical instruments were purchased for `8000. The first was sold at a profit of 40% and the second at loss of 40%. If the sale price was the same in both the cases, what was the cost price of two electronic musical instruments?
   (a) `2000, `5000   (b) `2200, `5500
   (c) `2400, `5000   (d) `2400, `5600

24. A man sells an article at a gain 15%. If he had bought it at 10% less and sold it for `4 less, he would have gained 25%. Find the cost price of the article.
   (a) `150   (b) `160
   (c) `170   (d) `180

25. A businessman, while selling 20 articles, loses the cost price of 5 articles. Had he purchased the 20 articles for 25% less and sold them for $3\frac{2}{3}$% more than the original selling price, what is his gain?
   (a) 5%   (b) 75%
   (c) 33\frac{1}{3}%   (d) 45%

26. Five kg of butter was bought by a shopkeeper for `300. One kg becomes unsalable. He sells the remaining in such a way that on the whole he incurs a loss of 10%. At what price per kg was the butter sold?
   (a) `67.50   (b) `52.50
   (c) `60   (d) `72.50

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27. 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 `30.09, thereby earning a profit of 25%. The cost price for the manufacturer is (a) `15 (b) `16 (c) `17 (d) `18

28. By selling 66 metres of cloth a person gains the cost price of 22 metres. Find the gain per cent. (a) 22% (b) 22 1/2% (c) 33% (d) 33 1/3%

29. A dairy man pays `6.40 per litres of milk. He adds water and sells the mixture at ` 8 per litres, there by making 37.5% profit. The proportion of water to milk received by the customer is: (a) 1:10 (b) 1:12 (c) 1:15 (d) 1:20

30. A single discount equal to a discount series of 10% and 20% is (a) 25% (b) 28% (c) 30% (d) 35%

31. The list price of a watch is `160. A retailer bought the same watch `122.40. He got two successive discounts one at 10% and the other at a rate which was not legible. What is the second discount rate? (a) 12% (b) 14% (c) 15% (d) 18%

32. Instead of a meter scale cloth merchant uses a 120 cm scale while buying but use an 80 cm scale while selling the same cloth. If he offers a discount of 20 per cent of cash payment, what is his overall per cent profit? (a) 20% (b) 25% (c) 40% (d) 15%

33. A trader marks his good at such a price that he can deduct 15% for cash and yet make 20% profit. Find the marked price of an item which costs him `90:
   (a) `135 11/13 (b) `105 5/21 (c) `127 1/17 (d) `95 1/21

34. A trader wants 10% profit on the selling price of a product whereas his expense amount to 15% on sales. What should be his rate of mark up on an article costing `9? (a) 20% (b) 66 2/3% (c) 30% (d) 100 1/3%

35. A wholesaler sells 30 pens at the price of 27 pens to a retailer. The retailer sells the pens at their market price. The profit for the retailer is (a) 11% (b) 10% (c) 11 1/3% (d) 9 1/11%

36. A discount of 16% on the marked price of a book enables a man to buy a pen which costs `80. How much did he pay for the book? (a) `420 (b) `450 (c) `480 (d) `495

37. A shopkeeper fixes the marked price of an item 20% above the cost price. He allows his customers a discount and makes a profit of 8%. Find the rate of discount. (a) 8% (b) 9% (c) 10% (d) 11%

38. A chair originally costs `50. It was offered for sales at 108% of its cost. After a week, the price was 10% discounted and was sold. Find the sale price. (a) `46.80 (b) `48.60 (c) `50 (d) `52.40

39. By selling an umbrella for `30, a merchant gains 20%. During a clearance sale, the merchant allows a discount of 10% off the marked price (the price at which he used to sell). Find his again per cent. (a) 6% (b) 7% (c) 8% (d) 9%
40. By what % must the cost of goods be marked up so that even after a discount of 20% the same amount is realised as before the discount?
   (a) 20  (b) 25  (c) 40  (d) 10

41. Goods are sold so that when a discount of 4 percent is given on the sale price, a profit of 20 percent is made. How much percent, is the sale price higher than the cost price?
   (a) 20%  (b) 24%  (c) 27%  (d) 25%

42. A man sells his car for `5000 and loses something. Had he sold it for `5600, his gain would have been double the former loss. Find the cost price.
   (a) `5500  (b) `5100  (c) `5400  (d) `5200

43. A manufacturer sells goods to an agent at a profit of 20%. The agent’s wholesale price to a shopkeeper is at a profit of 10% and the shopkeeper retails his goods at a profit of 12%. Find the retailer’s price of an article which had cost the manufacturer `25.
   (a) `37  (b) `40  (c) `44  (d) `46

44. A business man sells goods to an agent at a profit of 20%. The agent’s wholesale price to a shopkeeper is at a profit of 10% and the shopkeeper retails his goods at a profit of 12%. Find the retailer’s price of an article which had cost the manufacturer `25.
   (a) `2450  (b) `2225  (c) `2000  (d) `1880

45. A sells an article which costs him `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 to B.
   (a) `472  (b) `476

46. A shopkeeper buys 50 dozen eggs at `4 per dozen. Out of them, 40 eggs were found broken. At what rate should he sell the remaining eggs per dozen so as to gain 5% on the whole?
   (a) `4  (b) `4.25  (c) `4.50  (d) `5.25

47. A person sells his table at a profit of 12 1/2% and the other had if he sells the table at a loss of 8 1/3% but on the whole he gains `25. On the other hand if he sells the table at a loss of 8 1/3% and the chair at a profit of 12 1/2% then he neither gains nor loses. Find the cost price of the table.
   (a) `120  (b) `360  (c) `240  (d) `230

48. Kabir buys an article with 25% discount on its marked price. He makes a profit of 10% by selling it at `660. The marked price is
   (a) `600  (b) `685  (c) `700  (d) `800

49. On the eve of Gandhi Jayanti, Gandhi Ashram declared a 25% discount on silk. If selling price of a silk saree is `525, what is its marked price?
   (a) `700  (b) `725  (c) `750  (d) `775

50. A shopkeeper marks an article at a price which gives a profit of 25%. After allowing certain discount, the profit reduces to 12 1/2%. The discount percent is
   (a) 12%  (b) 12.5%  (c) 10%  (d) 20%

51. ACD was sold at a profit of 12 1/2%. If it had been sold at a profit of 15%, it would have

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52. A trader has a weighing balance that shows, 1, 200 gm for a kilogram. He further marks up his cost by 10%. Then the net profit percentage is
(a) 32%  (b) 23%  (c) 31.75%  (d) 23.5%

53. A shopkeeper allows 10% discount on goods when he sells without credit. Cost price of his goods is 80% of his selling price. If he sell his goods by cash, then his profit is
(a) 50%  (b) 70%  (c) 25%  (d) 40%

54. A dealer of scientific instruments allows 20% discount on the marked price of the instruments and still makes a profit of 25%. If his gain over the sale of an instrument is ₹150, find the marked price of the instrument.
(a) ₹938.50  (b) ₹940  (c) ₹938  (d) ₹937.50

55. Ram bought a T.V. with 20% discount on the labelled price. Had he bought it with 30% discount he would have saved ₹800. The value of the T.V. set that he bought is
(a) ₹5,000  (b) ₹8,000  (c) ₹9,000  (d) ₹10,000

56. A sold an article to B at 20% profit and B sold it to C at 15% loss. If A Sold it to C at selling price of B, then A would make.
(a) 5% profit  (b) 2% profit  (c) 2% profit  (d) 5% loss

57. A trader ho marks his goods up to 50% offered a discount of 20%. What % profit the trader makes after offering the payment?
(a) 30%  (b) 70%  (c) 20%  (d) 50%

58. A retailer buys a sewing machine at a discount of 15% and sells it for ₹1955. Thus he makes a profit of 15%. The discount is
(a) ₹270  (b) ₹290  (c) ₹300  (d) ₹310

59. A tea-merchant professes to sell tea at cost price but uses a false weight of 900 gram for a kilogram. The profit percent in his transaction is
(a) 11%  (b) 10%  (c) 9%  (d) 15%

60. Mahesh earned a profit of 20% by selling 60 apples at the rate of 42.50 for 5 apples. Then the total cost, at which the apples were bought is
(a) ₹452  (b) ₹425  (c) ₹450  (d) ₹485

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**HINTS & EXPLANATIONS**

1. (a) Let the cost of production of the table be `x.
   Then, 125% of 115% of 110% of x = 1265
   \[
   \frac{125}{100} \times \frac{115}{100} \times \frac{110}{100} \times x = 1265
   \]
   \[
   \frac{253}{160} x = 1265 \Rightarrow x = \left(\frac{1265 \times 160}{253}\right) = \text{₹}800
   \]

2. (b) Let the original price of the jewel be `P and let the profit earned by the third seller be x%.

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

3. (b) Let C.P. = `x then profit = S.P. – C.P.
   \[
   \frac{1}{10} \times x = 891 - x \Rightarrow \frac{11x}{10} = 891
   \]
   \[
   x = \frac{891 \times 10}{11} = 810
   \]

4. (d) Let the Sp of the article be `x
   Expenses = 15% of x = `0.15x
   Profit = 10% of x = `0.10x
   CP = `9 (given)
   Therefore, 9+0.15x + 0.1x = x \Rightarrow x=12
   \[
   \therefore \% \text{ increase for marked price} = \frac{12-9}{9} \times 100 \%
   \]
   \[
   = \frac{100}{3}\%
   \]

5. (d) C.P. for 1 lichchus = `\frac{10}{11}
   S.P. for 1 lichchus = `\frac{11}{10}
   \[
   \therefore \% \text{ gain} = \left(\frac{\frac{11}{10} - \frac{10}{11}}{\frac{10}{11}}\right) \times 100 = 21\% 
   \]
   Quantity Price
   
   \[
   \begin{array}{c|c|c}
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   \text{11} & \text{10} & \text{11} \\
   \hline
   \end{array}
   \]
   \[
   \text{gain} = \left(\frac{\frac{11 \times 11}{10} - 1}{10}\right) \times 100 = \left(\frac{211}{100}\right) \%
   \]
   \[
   = 21\%
   \]

6. (b) S.P. for 1 egg = `\frac{5}{10} = Rs \frac{1}{2}
   \[
   \therefore \text{C.P. for 1 egg} = \left(\frac{100}{100+20}\right) \times \frac{1}{2} = \frac{5}{12}
   \]
   \[
   \Rightarrow \text{He bought 12 eggs for 5 rupees.}
   \]

7. (c) Let he sells x oranges per rupee.
   \[
   \frac{1}{36} : (10 - 4) :: x : (10 + 8)
   \]
   \[
   \Rightarrow x = \frac{108}{96 \times 36} = \frac{1}{32}
   \]
8. (b) Cost price for one coconut = Rs \(\frac{150}{100}\) = Rs \(\frac{3}{2}\)
   Selling price for one coconut = ₹2
   Profit on one coconut = \(2 \times \frac{3}{2} = \frac{1}{2}\)
   \(\therefore\) Profit on 2000 coconut = \(\frac{1}{2} \times 2000 = \text{₹}1000\)

9. (a) Let C.P. = Rs 100, then M.P. = \(\text{₹}150\)
   Selling price = 70% of \(\text{₹}150\) = \(\text{₹}105\)
   \(\therefore\) % profit = \(\frac{105 - 100}{100} \times 100 = 5\%\)

10. (b) Let S.P. = \(\text{₹}x\) per kg
    Selling price of 2 kg of rice = \(2x = \text{loss}\)
    Now, Loss = C.P. – S.P.
    \(2x = 600 - 10x\)
    \(\Rightarrow x = \text{₹}50\) per kg

11. (a) Let CP = \(\text{₹}100\)
    Then, S.P. = \(\text{₹}117\)
    Let marked price be Rs. \(x\).
    Then, 90% of \(x\) = 117 \(\Rightarrow x = \frac{117 \times 100}{90} = 130\)
    \(\therefore\) Marked price = 30% above C.P.

12. (b) S.P. = C.P \(\left(\frac{80}{100}\right)\) ⇒ S.P. = \(\frac{4}{5}\) C.P. ... (1)
    S.P. +12 = C.P. \(\left(\frac{110}{100}\right)\) ⇒ S.P. = \(\frac{11}{10}\) C.P. -12 ... (2)
    From eqn. (1) and (2)
    \(\frac{4}{5}\) C.P. = \(\frac{11}{10}\) C.P. - 12
    \(\Rightarrow\) C.P. = \(\frac{110}{4} = 27.5\) C.P. = \(\frac{110}{40}\)

13. (b) Let profit per litre = \(\text{₹}20\)
    So, C.P./litre = \(\text{₹}100\)
    S.P./litre = \(\text{₹}120\)
    On adding 10% water to the milk
    C.P. per \(\frac{9}{10}\) litre = \(\text{₹}100\)
    S.P. per \(\frac{9}{10}\) litre = \(\text{₹}100\)
    S.P. per litre = \(\frac{120 \times 10}{9} = \text{₹}\frac{400}{3}\)

14. (b) Cost price of 200 kg of mixture = \(\text{₹}(80 \times 13.50 + 120 \times 16)\)
    = \(\text{₹}3000\).
    Selling price = 116% of \(\text{₹}3000\) = \(\frac{116}{100} \times 3000\)
    = \(\text{₹}3480\)
    \(\therefore\) Rate of S.P. of the mixture = \(\text{₹}\left(\frac{3480}{200}\right)\) per kg
    = \(\text{₹}17.40\) kg

15. (a) He gives 800 grams but charges the price of 100 grams (1 kg)
    \(\Rightarrow\) on every 800 grams, he gains \(1000 - 800\) grams i.e. 200 grams.
    \(\therefore\) His gain \(\% = \frac{200}{800} \times 100 = 25\%\)
    Short cut:
    \(\text{Gain }\% = \frac{\text{error}}{\text{true weight}} - \frac{\text{true weight}}{\text{true weight}}\)
    \(= \frac{200}{1000 - 200} \times 100 = 25\%\)

16. C.P. of 150 calculators
    \(\text{= }150 \times 250+2500=37500+2500=\text{₹}40000\)
    Labelled price of 150 calculators
    \(\text{= }150 \times 320 = \text{₹}48000\)
    Discount allowed = 5%
    \(\therefore\) S.P. of 150 calculators
    \(\text{= }48000 - 5\% \text{ of } 48000=\text{₹}45600\)
    \(\therefore\) Profit \(\% = \frac{5600}{40000} \times 100 = 14\%\)

17. (b) \(\text{True weight} = \frac{100 + \text{gain }\%}{100 + x}\)
    \(\text{Here S.P. = C.P.} \therefore x = 0\)
    \(\Rightarrow\) False weight = \(\frac{100 \times 100}{125} = 800\ gm\)

18. Let cost price = \(\text{₹}100\)
    \(\therefore\) Marked price = \(\text{₹}135\)
    After discount, selling price = \(135 - 13.5 = 121.5\)
    \(\therefore\) profit \(\% = 121.5 - 100 = 21.5\%\)

19. (a) S.P. of the 1st chair = \(\text{₹}500\)
    Gain = 20%
20. (a) Women’s shirt comprise 60% of the output.

\[ \therefore \text{C.P. of the 1 st chair} = \frac{500 \times 100}{100+20} = \frac{500 \times 100}{120} = \frac{1250}{3} \]

S.P. of the 2nd chair = \( \frac{500 \times 100}{100-12} = \frac{500 \times 100}{88} \)

\[ = \frac{500 \times 25}{22} = \frac{250 \times 25}{11} = \frac{6250}{11} \]

Now S.P. of both the chairs = `1000

C.P. of both the chairs
\[ = \frac{500}{3} + \frac{6250}{11} = \frac{13750 + 18750}{33} = \frac{32500}{33} \]

\[ \therefore \text{Net gain} = 100 - \frac{32500}{33} = \frac{500}{33} \]

\[ \Rightarrow \text{Gain} = \frac{\frac{500}{33}}{\frac{500}{33}} \times 100 = \frac{500}{32500} \times 100 \]

\[ = \frac{100}{65} = \frac{20}{13} = 1.5\% \text{ (To one place of decimal)} \]

Shortcut Method:
\[ \begin{align*}
\text{First C.P.} & = 100 \times 3 = 300 \text{ Rs} \\
\text{Second C.P.} & = 100 \times 12 = 1200 \text{ Rs} \\
\text{First S.P.} & = 20 \times 15 = 300 \text{ Rs} \\
\text{Second S.P.} & = 20 \times 12 = 240 \text{ Rs} \\
\end{align*} \]

\[ \text{Difference of two selling prices} = 20 \text{ Rs} \]

\[ \Rightarrow \text{Second S.P.} - \text{First S.P.} = 20 \text{ Rs} \]

\[ \Rightarrow \text{CP.} = 100/2.50 \times .4=160 \text{ Rs} \]

22. (b) Let the C.P. of horse = `x

\[ \text{Then the C.P. of carriage} = \text{Rs (3000-x)} \]

20% of x – 10% of (3000-x) = 2% of 3000

\[ \Rightarrow \frac{x}{5} - \frac{(3000-x) \times 10}{100} = 60 \]

\[ \Rightarrow 2x - 3000 + x = 600 \]

\[ \Rightarrow 3x = 3600 \Rightarrow x = 1200 \]

23. (d) Here, S.P₁ = S.P₂

\[ \Rightarrow 140 \text{ CP₁} = 60 \text{ CP₂} \Rightarrow \frac{\text{CP₁}}{\text{CP₂}} = \frac{6}{14} = \frac{3}{7} \]

\[ \therefore \text{CP₁} = \frac{3}{(3+7)} \times 8000 = 2400 \]

and CP₂ = 8000-2400= `5600

24. (b) Let the C.P. be Rs 100

First S.P. = `115
Second C.P = 90…… Second s.p = 125% of 90 = `112.50 Difference of two selling prices is `115 – Rs 112.50= 2.50 and c.p of the article is `100. But actual difference is Rs.4

\[ \therefore \text{C.P}= 100/2.50 \times .4= 160 \text{ Rs} \]

25. (c) Let the price of 1 article = `1

\[ \Rightarrow \text{Loss} = 20 \text{ C.P.} - 20 \text{ S.P.} \]

\[ \Rightarrow 5 \text{C.P.} = 20 \text{ C.P.} - 20 \text{ S.P.} \Rightarrow 20 \text{ S.P.} = 15 \text{ C.P.} \]

\[ \Rightarrow \text{CP₁ of 20 articles} = `20 \]

\[ \Rightarrow \text{SP₁ of 20 articles} = `15 \]

Also given that, had he purchased the 20 articles for 25% less and sold them for 33\(\frac{1}{3}\)% more, then

\[ \Rightarrow \text{CP₂ of 20 articles} = `15 \]

\[ \Rightarrow \text{CP₂ of 20 articles} = `20 \]

\[ \therefore \text{Gain percentage} = \frac{20-15}{15} \times 100 = 33\frac{1}{3}\% \]

26. (a) Let S.P. = `x per kg

\[ \therefore \text{S.P. of 4 kg} = `4x \]

\[ .4x = \frac{100-10}{100} \times 300 \]

\[ \Rightarrow x = \frac{270}{4} = `67.50 \]

27. (c) Let the cost price of manufactures is =P
Selling price of manufacturer = \(P + \frac{18}{100}P\)
\[= \frac{59P}{50}\]

Wholesaler selling price = \(\frac{59P}{50} + \frac{59P}{50} \times \frac{20}{100}\)
\[= \frac{354P}{250}\]

Retailer selling price = \(\frac{354P}{250} + \frac{354P}{250} \times \frac{25}{100}\)
\[= \frac{805P}{500}\]

\[\text{Now, } \frac{805P}{500} = 30.09 \Rightarrow P = 17\]

28. (d) Let C.P. of one metre of cloth = `1
then C.P. of 66 metres of cloth = `66
Gain = C.P. of 22 metres = `22
\% gain = \(\frac{22}{66} \times 100 = 33\frac{1}{3}\%\)
Shortcut method:
If on selling ‘x’ articles, a man gains equal to the C.P. of ‘y’ articles, then \% gain = \(\frac{y}{x} \times 100\)
\(\therefore \%\) gain = \(\frac{22}{66} \times 100 = 33\frac{1}{3}\%\)

29. (a) Mean cost price = \(\frac{100}{137.5} \times 8 = 10\) using allegation rule.

\begin{align*}
\text{C.P.} & \quad \text{of 1 litre} \\
\text{water} & \quad \text{milk} \\
\text{Rs.0} & \quad 6.40 \\
\hline \\
64/11 & \quad 66/11 \\
\hline \\
64/11 & \quad 64/11
\end{align*}

\(\text{Required ration} = \frac{64}{110} = \frac{64}{11} = 1:10\)

30. (b) Equivalent discount = \(10+20 \times \frac{10 \times 20}{100}\)
\[= 30.2 = 28\%\]

31. (c) Retailer price = list price \(\left(1 - \frac{d_1}{100}\right)\left(1 - \frac{d_2}{100}\right)\)
\[\Rightarrow 122.40 = 160 \left(1 - \frac{10}{100}\right) \left(1 - \frac{d_2}{100}\right)\]
\[\Rightarrow 1 - \frac{d_2}{100} = \frac{122.40 \times 100}{160 \times 90} = 0.85\]
\[\Rightarrow d_2 = (1 - 0.85) \times 100 = 15\%\]

32. (a) Let the cost of cloth per cm be `x
As he uses 120 cm scale, so he has 120 cm cloth cost incurred = 100x. While selling he uses 80 cm scale, so actually he charges for \(\frac{100}{80} \times 20 = 150\) cm of cloth
Amount obtained after 20% discount = \(0.8x \times 150 = 120x\)
\(\therefore \) Profit = \(\frac{20x}{100x} \times 100 = 20\%\)

33. (c) SP = 90 \times 1.2 = Rs 108
Marked price = \(\frac{108}{0.85} = `127.05\)

34. (d) Let the SP of the article be `x
Expenses = 15\%\) of x = `0.15x
Profit = 10\%\) of x = Rs 0.10x
CP = `9 (given)
Therefore, \(9 + 0.15x + 0.1x = x \Rightarrow x = 12\)
\(\therefore \%\) increase for marked price = \(\frac{12 - 9}{9} \times 100 = 100\%\)

35. (c) Retailer’s S.P. = M.P.
Retailer’s C.P. for 30 Pens = M.P. of 27 pens
\(\therefore\) Retailer’s S.P. for 30 pens = M.P. of 30 pens
\(\therefore \%\) gain = \(\frac{30 - 27}{27} \times 100 = \frac{100}{9} = 11\frac{1}{9}\%\)

36. (a) Let M.P. = `100
then discount = `16
\(\therefore\) when discount = `80, then M.P. = `x
\(\therefore\) \(\frac{100}{16} \times \frac{x}{80} \rightarrow\) it’s direct proportion
\(\therefore 100: x:: 16: 80\)
\[\Rightarrow 16x = 100 \times 80 \Rightarrow x = 500\]
Now, since M.P. = `500, therefore, after 16\% discount
man paid = \(500 \left(1 - \frac{16}{100}\right) = 420\)
37. (c) Let C.P. = `100. Then M.P. = `120 and S.P. = `108
\[ \text{% discount} = \left( \frac{12}{120} \times 100 \right) \% = 10\% \]

38. (b) Offering price = \( \frac{50 \times 108}{100} \) = `54
After 10% discount, S.P. = 90% of 54 = `48.60

39. (c) \( 100 + g_1 : S_1 :: (100 + g_2) : S_2 \)
\( (100 + 20) : 30 :: (100 + g_2) : 30 \left(1 - \frac{10}{100}\right) \)
\[ \text{[10% discount is allowed on S.P.]} \]
\( 120 : 30 :: (100 + g_2) : 27 \)
100 + \( g_2 \) = \( \frac{120 \times 27}{30} \) = 108
\( g_2 = 8\% \)

40. (b) Let C.P. = Rs 100, Also, let M.P. = `x
Given, C.P. after 20% discount on M.P. = C.P.
\[ \Rightarrow 80\% \text{ of } x = 100 \]
\[ \Rightarrow x = \frac{100 \times 100}{80} = \text{`}125 \]

41. (c) Let the C.P. be Rs. 100
S.P. = Rs 120
Discount being 4%, S.P. is 96% of sale price
\[ \therefore 96\% \text{ of sale price} = \text{`}120 \]
\[ \Rightarrow \text{Sale price is } 25\% \text{ higher than the C.P.} \]

42. (d) Let his loss = `x. Then,
C.P. = 5000 + x = 5600 - 2x
\[ \Rightarrow 3x = 600 \Rightarrow x = 200 \]
\[ \Rightarrow \text{C.P. } = 5000 + 200 = \text{Rs 5200} \]

43. (a) Retailer’s price = 112% of 110% of (120% of 25)
\[ = \frac{112}{100} \times \frac{110}{100} \times \frac{120}{100} \times 25 = \text{`}36.96 \approx 37 \]

44. (c) Let C.P. = `x.
120% of \( \left( \frac{225}{2} \% \text{ of } x \right) = 2700 \)
\[ \Rightarrow \frac{120}{100} \times \frac{225}{2 \times 100} \times x = 2700 \Rightarrow x = 2000 \]

45. (c) C.P for B = 120% of `400 = \( \frac{120}{100} \times 400 \)
= `480

C.P. for C = 110% of `480 = \( \frac{110}{100} \times 480 \)
= `528.
51. (c) 1st case:
\[ \text{S.P.} = \frac{100 + \text{Profit} \%}{100} \times \text{C.P} \Rightarrow \text{S.P.} = \frac{100 + 25 \times \text{C.P}}{100} \]
\[ \Rightarrow \text{S.P.} = \frac{112.5 \times \text{C.P}}{100} \ldots (1) \]

IInd case:
\[ \text{S.P.} = \frac{100 + \text{Profit} \%}{100} \times \text{C.P} \Rightarrow \text{S.P.} + 10 = \frac{100 + 15 \times \text{C.P}}{100} \]
\[ \Rightarrow \left( \frac{\text{S.P.} + 10}{100} \right) = \frac{115}{100} \times \text{C.P.} \ldots (2) \]

\[ \frac{\text{S.P.}}{\text{S.P.} + 10} = \frac{112.5 \times \text{C.P}}{115 \times \text{C.P}} \]
\[ \text{S.P.} = \frac{112.5}{150} \times (\text{S.P.} + 10) \]
\[ 115 \times \text{S.P.} = 112.5 \times \text{S.P.} + 1125 \]
\[ \text{S.P.} = 450 \]
\[ \therefore \text{C.P.} = \frac{\text{S.P.} \times 100}{112.5} = \frac{450 \times 100}{112.5} = 400 \]

52. (a) The trader professes to sell 1200 kg but sells only 1000 kg.
So profit = 20%
Markup = 10%
Total profit = 10 + 20 + \frac{10 \times 20}{100} = 32%

53. (c) Let marked price of goods be `100.
Selling price goods = 100 \times 100 = `90
Cost price of goods is 80% of its selling price
\[ \text{C.P.} = \frac{80}{100} \times 90 = 72 \]
Profit on goods = (90 - 72) = `18

54. (a) Let marked price of the instruments be `x
Selling price, S.P. = x - \frac{20}{100} x = 0.8x
Cost price, C.P. = C.P. + \frac{25}{100} \times \text{C.P.} = 0.8x
\[ \text{C.P.} = \frac{0.8x \times 100}{125} = \frac{16}{25} x \]
\[ x = \frac{25}{16} \times \text{C.P.} \]
Given that \[ \frac{25}{100} \times \text{C.P.} = 150 \]
\[ \Rightarrow \text{C.P.} = \frac{150 \times 100}{25} = 600 \]
Marked price \[ x = \frac{25}{16} \times 6000 = `938.50 \]

55. (b) Let labelled price of T.V. be `x
Price after 20% discount, x - \frac{20}{100} x = 0.8x
Price after 30% discount, x - \frac{30}{100} x = 0.7x
According to question
\[ 0.8x - 0.7x = 800 \]
\[ x = 800 \times 10 = 8000 \]

56. (b) Let `100 be the cost price for A.
S.P. for A = 100 + 20% of 100 = 120
S.P. for B = 120 - 15% of 120 = 102
Profit % = \frac{102 - 100}{100} \times 100 = 2%

57. (c) Let cost price of good be 100
Trades mark up at 50% more i.e. 150
Selling price of goods = 150 - \frac{20}{100} \times 150 = 120
Profit % = \frac{120 - 100}{100} \times 100 = 20%

58. (c) Let original price of sewing machine be `x
Retailer sought it at \[ x - \frac{15}{100} x = 0.85x \]
\[ 0.85x + \frac{15}{100} \times 0.85x = 1955 \]
\[ 1.15 \times 0.85x = 1955 \]
\[ x = \frac{1955 \times 10000}{115 \times 85} = 2000 \]
Discount is \[ \frac{15}{100} \times 200 = `300 \]

59. (a) Profit % = \frac{1000 - 900}{900} \times 100 = 11 \frac{1}{9} %

60. (b) Selling price of 5 apples = `42.50
Selling price of 60 apples = \[ \frac{42.5 \times 100}{5} \times 60 = 510 \]
C.P. + Profit = S.P.
C.P. + \frac{20}{100} \times \text{C.P.} = 510
\[ \text{C.P.} = \frac{510}{120} \times 100 = `425 \]