

ANSWERS AND EXPLANATIONS

EXERCISE 1

1. (a) Percentage profit = $\frac{2}{12-2} \times 100 = 20\%$

2. (c) $CP = 20 \times 15 + 30 \times 13 = ₹ 690$

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

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

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

$$168 - 2x = 96 - x \quad \therefore x = ₹ 72$$

4. (e) If no discount is given, selling price of TV

$$= 17940 \times \frac{100}{92} = ₹ 19500$$

$$\text{Cost price of TV} = 17940 \times \frac{100}{119.60} = ₹ 15000$$

$$\text{Gain \%} = \frac{19500 - 15000}{15000} \times 100 = 30\%$$

5. (a) List price of calculator

$$= \frac{82.50}{30} \times 100 = ₹ 275$$

Deepa bought calculator in

$$275 \times 0.70 = ₹ 192.50$$

6. (e) Let the marked price (SP) = ₹ x

According to the question,

$$75\% \text{ of } x = 1545$$

$$\text{or, } x = \frac{1545 \times 100}{75} = ₹ 2060$$

7. (e) CP of DVD player = ₹ x

According to the question,

$$\therefore x \left(1 + \frac{22}{100} \right) = ₹ 10980$$

$$\therefore x = 10980 \times \frac{50}{61} = ₹ 9000$$

8. (a) Let the cost price be ₹ x

Now, according to the question,

$$\therefore x \times \frac{128}{100} = 4544$$

$$\therefore x = \frac{4544 \times 100}{128}$$

$$= \frac{4544 \times 10}{128}$$

$$= ₹ 3550$$

9. (d) CP of 9 kg of sugar = ₹ 279

$$\therefore \text{CP of 1 kg of sugar} = ₹ \frac{279}{9}$$

\therefore CP of 153 kg of sugar

$$= ₹ \left(\frac{279}{9} \times 153 \right) = ₹ 4743$$

10. (a) Required price

$$= (4 \times 12 \times 2.25 + 3 \times 12 \times 3)$$

$$= (108 + 108) = ₹ 216$$

11. (e) Let the cost price of a toy be = ₹ x

According to the question,

$$\therefore x \times \frac{125 \times 12}{100} = 300$$

$$\text{or } x = \frac{300 \times 100}{125 \times 12} = ₹ 20$$

12. (a) CP of television set

$$= ₹ \left(\frac{11500 \times 100}{125} \right) = ₹ 9200$$

13. (e) \therefore Cost of 13 kg of sugar = ₹ 195

$$\therefore \text{Cost of 1 kg of sugar} = ₹ \frac{195}{13}$$

$$\therefore \text{Cost of 21 kg sugar} = \frac{195}{13} \times 21 = ₹ 315$$

Similarly,

$$26 \text{ kg of rice} = \frac{544}{17} \times 26 = ₹ 832$$

Cost of 19 kg of wheat

$$= \frac{336}{21} \times 19 = ₹ 304$$

$$\therefore \text{Total cost} = (315 + 832 + 304) ₹ = ₹ 1451$$

14. (e) Let the original selling price of watch = ₹ x

According to the question,



$$x \times \frac{76}{100} = 779$$

$$\text{or, } x = \frac{779 \times 100}{76} = ₹1025$$

15. (e) Cost of 26 gms of gold = $\frac{8250}{15} \times 26 = ₹14300$

Cost of 24gms of silver = $\frac{6825}{21} \times 24 = ₹7800$

Cost of 52 gms of silver

$$= \frac{312}{26} \times 52 = ₹624$$

$$\therefore \text{Total cost} = (14300 + 7800 + 624) = ₹22724$$

16. (b) Required cost price

$$= \frac{100 \times 4921}{133} = ₹3700$$

17. (b) Cost price = $\frac{2817.50 \cdot 100}{115}$

$$= ₹2450$$

18. (c) 24 bats + 32 sticks = ₹5600

$$\therefore 8(3 \text{ bats} + 4 \text{ sticks})$$

$$= ₹5600$$

$$\Rightarrow 3 \text{ bats} + 4 \text{ sticks}$$

$$= \frac{5600}{8} = ₹700$$

19. (a) \therefore The cost of 4 cell-phones and 7 digital cameras

$$= ₹125627$$

\therefore cost of 8 cell-phones and 14 digital cameras

$$= (2 \times 125627)$$

$$= ₹251254$$

20. (b) Let the CP of a calculator and pen-stand be ₹ x and ₹ y respectively.

According to the question,

$$x + 4y = 2140 \quad \dots(i)$$

$$x + 5y = 1355 \quad \dots(ii)$$

$$3x + 4y = 2140 \text{ (i)} \times 5 - \text{equation (ii)} \times 4$$

$$15x + 20y - 4x - 20y = 10700 - 5420$$

$$\Rightarrow 11x = 5280$$

$$\Rightarrow x = \frac{5280}{11} = ₹480$$

$$\therefore 4 - \text{CP of 4 calculators} = ₹(4 \times 480) = ₹1920$$

21. (a) Cost price

$$= \frac{1754 + 1492}{2} = ₹1623$$

22. (c) Required amount

$$= \frac{10500 \cdot 100 \cdot 100}{120 \cdot 140} = ₹6250$$

23. (e) 15 pendants + 24 chains

$$= 3(5 \text{ pendants} + 8 \text{ chains})$$

$$= 3 \times 145785 = ₹437355$$

24. (a) Original selling price

$$= \frac{3675.4 \cdot 100}{85}$$

$$= ₹4324$$

25. (d) Selling price

$$= 5600 \times \frac{3}{4} = ₹4200$$

\therefore Loss percent

$$= \frac{(5600 - 4200)}{5600} \times 100$$

$$= 25\%$$

26. (b) Required cost

$$= \frac{450}{5} \times 8 + \frac{4320}{12} \times 8 + \frac{240}{4} \times 8$$

$$= 720 + 2880 + 480 = ₹4080$$

27. (b) Let S.P. = ₹100. Then, C.P. = ₹96; Profit = ₹4.

$$\therefore \text{Profit} \quad \%$$

$$= \left(\frac{4}{96} \times 100 \right) \% = \frac{25}{6} \% = 4.17\% \approx 4.2\%$$

28. (a) Let the cost of production of the table be ₹ x.

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

$$\Rightarrow \frac{125}{100} \times \frac{115}{100} \times \frac{110}{100} \times x = 1265$$

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



29. (d) C. P. for 50 pencils = ₹ 100

$$\therefore \text{C. P. for 45 pencils} = \frac{100}{50} \times 45 = \text{Rs. } 90$$

= S.P. of 45 pencils

\therefore No gain, no loss

30. (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

$$\therefore \% \text{ gain} = \frac{30-27}{27} \times 100 = \frac{100}{9} = 11\frac{1}{9}\%$$

31. (a) Let M.P. = ₹ 100

then discount = ₹ 16

\therefore when discount = ₹ 80, then M.P. = ₹ x

Now, $\downarrow \frac{100}{16} \quad x \quad \downarrow \frac{80}{80}$ 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%

$$\text{discount man paid} = 500 \left(1 - \frac{16}{100}\right) = \text{Rs } 420$$

32. (c) Let C.P. = ₹ 100. Then M.P. = ₹ 120 and S.P. = ₹ 108

$$\% \text{ discount} = \left(\frac{12}{120} \times 100\right)\% = 10\%$$

33. (b) Offering price = $\frac{50 \times 108}{100} = \text{Rs } 54$

After 10% discount, S.P. = 90% of 54

$$= \frac{90 \times 54}{100} = \text{Rs } 48.60$$

34. (c) Let A paid = ₹ x

125% of 120% of x = 225

$$\Rightarrow \frac{125}{100} \times \frac{120}{100} \times x = 225$$

$$\Rightarrow x = \frac{225 \times 100 \times 100}{125 \times 120} = \text{Rs } 150$$

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

₹ 480

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

36. (c) C.P. = $50 \times 4 = ₹ 200$

Remaining eggs = $600 - 40 = 560$

Let S.P. of eggs = ₹ x per dozen

$$\therefore \text{Total S.P.} = ₹ \frac{560}{12} x$$

$$\therefore \frac{560}{12} x = \frac{(100+5)\%}{100} \times 200$$

$$\Rightarrow x = \frac{105}{100} \times \frac{2400}{560} = \text{Rs. } 4.5 \text{ per dozen}$$

37. (d) Let C. P. = ₹ x. Then

S.P.₁ - S.P.₂ = ₹ 6

$$\frac{(100+10)x}{100} - \frac{(100+8)x}{100} = 6$$

$$\Rightarrow 110x - 108x = 600 \Rightarrow 2x = 600 \Rightarrow x = ₹ 300$$

38. (b) C.P. = $200 \left(1 - \frac{10}{100}\right) \left(1 - \frac{15}{100}\right) + 7$

$$= \frac{200 \times 90 \times 85}{100 \times 100} + 7 = \text{Rs } 153 + 7 = ₹ 160$$

$$\therefore \% \text{ gain} = \frac{200 - 160}{160} \times 100 = \frac{40}{160} \times 100 = 25\%$$

EXERCISE 2

1. (a) Purchase price = ₹ 480

Repair cost = 20% of ₹ 480 = ₹ 96

\therefore Total cost = ₹ 480 + ₹ 96 = ₹ 576

Net profit = ₹ 144

\therefore Selling price = Total cost + Net profit

= ₹ 576 + 144 = ₹ 720

Now, Selling price - Purchase price

= ₹ 720 - ₹ 480 = ₹ 240

$$\therefore \text{Reqd percentage} = \frac{₹ 240}{₹ 480} \times 100 = 50\%$$



2. (a) Let the price of one saree and one shirt be ₹ x and ₹ y respectively.

$$\text{Then, } 2x + 4y = 1600$$

$$\text{or, } x + 2y = 800 \dots (i)$$

$$\text{Also, } x + 6y = 1600 \dots (ii)$$

Solving equations (i) and (ii), we get

$$4y = 800 \text{ or, } y = 200$$

$$\therefore \text{ cost of 12 shirts} = 12 \times 200 = ₹ 2400$$

3. (b) CP of 150 calculators = $150 \times 250 = ₹ 37,500$.

$$\therefore \text{ total CP} = 37,500 + 2500 = ₹ 40,000$$

$$\text{Marked price of 150 calculators} = 150 \times 320 = ₹ 48,000$$

$$\text{Selling price after discount} = 48000 \times \frac{95}{100}$$

$$= ₹ 45,600$$

$$\therefore \text{ Percentage profit} =$$

$$\frac{45,600 - 40,000}{40,000} \times 100 = 14\%$$

4. (b) C.P. of 200 kg of mixture = ₹ $(80 \times 13.50 + 120 \times 16)$

$$= ₹ 3000.$$

$$\text{S.P.} = 116\% \text{ of } ₹ 3000$$

$$= ₹ \frac{116}{100} \times 3000 = ₹ 3480.$$

$$\therefore \text{ Rate of S.P. of the mixture}$$

$$= ₹ \frac{3480}{200} \text{ per kg}$$

$$= ₹ 17.40 \text{ per kg.}$$

5. (b) Let profit per litre = ₹ 20

$$\text{So, C.P. / litre} = ₹ 100$$

$$\text{S.P. / litre} = ₹ 120$$

On adding 10% water to the milk

$$\text{C.P. / } \frac{9}{10} \text{ litre} = ₹ 100$$

$$\text{S.P. / } \frac{9}{10} \text{ litre} = ₹ 120$$

$$\text{S.P. / litre} = ₹ \frac{120 \times 10}{9} = ₹ \frac{400}{3}$$

$$\Rightarrow \text{ Profit / litre} = \frac{400}{3} - 100 = 33.33$$

$$\% \text{ by which profit increases} = 33.33 - 20 = 13.3$$

6. (a) S.P. of the 1st chair = ₹ 500

$$\text{Gain} = 20\%$$

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

$$\frac{1250}{3}$$

$$\text{S.P. of the 2nd chair} = ₹ 500$$

$$\text{Loss} = 12\%$$

$$\therefore \text{ C.P. of the 2nd chair} = \frac{500 \times 100}{100 - 12} = \frac{500 \times 100}{88}$$

$$= \frac{500 \times 25}{22} = \frac{250 \times 25}{11}$$

$$\frac{6250}{11}$$

$$\text{Now S.P. of both the chairs} = ₹ 1000$$

$$\text{C.P. of both the chairs}$$

$$\frac{1250}{3} + \frac{6250}{11} = \frac{13750}{33} + \frac{18750}{33} = \frac{32500}{33}$$

$$\text{Net gain} = 1000 - \frac{32500}{33} = \frac{500}{33}$$

$$\Rightarrow \text{ Gain \%} = \frac{500/33}{32500/33} \times 100 = \frac{500}{32500} \times 100$$

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

7. (a) Women's shirt comprise 60% of the output.

\therefore Men's shirts comprise $(100 - 60) = 40\%$ of the output.

$$\therefore \text{ Average profit from men's shirt} = 8\% \text{ of } 40 = 3.2 \text{ out of } 40$$

$$\text{Overall average profit} = 6 \text{ out of } 100$$

\therefore Average profit from women's shirts = 2.8 out of 60 i.e. 0.0466 out of each shirt.

8. (c) Retailer price = list price $\left(1 - \frac{d_1}{100}\right) \left(1 - \frac{d_2}{100}\right)$



$$\Rightarrow 122.40 = 160 \left(1 - \frac{10}{100}\right) \left(1 - \frac{d_2}{100}\right)$$

$$\Rightarrow 1 - \frac{d_2}{100} = \frac{122.40 \times 100}{160 \times 90} = 0.85$$

$$\Rightarrow d_2 = (1 - 0.85) \times 100 = 15\%$$

9. (b) $(100 - \text{loss}) : S_1 :: (100 + \text{gain}) : S_2$
 $\therefore (100 - 12.5) : 420 :: (100 + 12.5) : S_2$
 $87.5 : 420 :: 112.5 : S_2$
 $\Rightarrow 87.5 \times S_2 = 420 \times 112.5$
 $\Rightarrow S_2 = \frac{420 \times 112.5}{87.5} = 540$

10. (c) Let the value of radio be ₹ x.

$$\text{Then C. P.} = \text{Rs } \frac{3}{4}x, \text{ S. P.} = x \left(1 + \frac{20}{100}\right) = \frac{6}{5}x$$

$$\therefore \% \text{ profit} = \frac{\frac{6}{5}x - \frac{3}{4}x}{\frac{3}{4}x} \times 100 = 60\%$$

11. (b) $(100 - 20) : 45 :: (100 + 20) : S_2$

$$\Rightarrow S_2 = \frac{45 \times 120}{80} = \text{Rs. } 67.50$$

12. (d) C.P. for 1 litchu = $\frac{10}{11}$ paise

$$\text{S. P. for 1 litchu} = \frac{11}{10} \text{ paise}$$

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

13. (b) S.P. for 1 egg = ₹ $\frac{5}{10} = \text{Rs } \frac{1}{2}$

$$\therefore \text{C. P. for 1 egg} = \frac{100}{(100 + 20)} \times \frac{1}{2} = \text{Rs } \frac{5}{12}$$

\Rightarrow He bought 12 eggs for 5 rupees.

14. (c) Let he sells x oranges per rupee.

$$\frac{1}{36} : (100 - 4) :: x : (100 + 8)$$

$$\Rightarrow x = \frac{108}{96 \times 36} = \frac{1}{32}$$

He sells 32 oranges per rupee.

15. (b) C.P. for one coconut = Rs $\frac{150}{100} = \text{Rs } \frac{3}{2}$

S.P. for one coconut = ₹ 2

$$\text{Profit on one coconut} = 2 - \frac{3}{2} = \text{Rs } \frac{1}{2}$$

$$\therefore \text{Profit on 2000 coconut} = \frac{1}{2} \times 2000 = \text{Rs } 1000$$

16. (a) Let C.P. = ₹ 100, then M. P. = ₹ 150

S.P. = 70% of 150 = ₹ 105

$$\therefore \% \text{ profit} = \frac{105 - 100}{100} \times 100 = 5\%$$

17. (a) C.P. for one orange = Rs $\frac{1}{15}$

$$\text{Then S.P.} = \frac{(100 + 25)}{100} \times \frac{1}{15} = \frac{125}{100 \times 15} = \frac{1}{12}$$

Hence S.P. for one orange = Rs $\frac{1}{12}$

\therefore 12 oranges must be sold for a rupee to gain 25%.

18. (b) C.P. of one litre = ₹ 6

After adding water to it

One has to pay ₹ 7.20 for $\frac{2}{3}$ litre of milk.

So S.P. of $\frac{2}{3}$ litre of milk = ₹ 7.20

$$\Rightarrow \text{S.P. of 1 litre of milk} = \text{Rs } \frac{7.20 \times 3}{2} = \text{Rs } 10.80$$

\therefore S.P. C.P.

$$\text{Hence gain} = \frac{10.80 - 6}{6} \times 100 = \frac{4.80}{6} \times 100$$

$$= 0.80 \times 100 = 80\%$$



19. (b) Let profit per litre = ₹ 20

So, C.P. / litre = ₹ 100

S.P. / litre = ₹ 120

On adding 10% water to the milk

C.P. per $\frac{9}{10}$ litre Rs 100

S.P. per $\frac{9}{10}$ litre Rs 120

S.P. per litre Rs $\frac{120}{9} \times 10$ Rs $\frac{400}{3}$

\Rightarrow Profit / litre $\frac{400}{3} - 100 = 33.33$

% by which profit increases = $33.33 - 20 = 13.3$

20. (d) Let C.P. = ₹ x. Then,

$$\text{S.P.} = \frac{(100-7)}{100} \times x = \frac{93}{100}x$$

$$\text{Also, } \left(\frac{93}{100}x + 48 \right) \frac{100}{(100+5)} = x$$

$$\Rightarrow 93x + 4800 = 105x$$

$$\Rightarrow 12x = 4800 \Rightarrow x = ₹ 400$$

21. (a) C.P. of 150 calculators

$$= 150 \times 250 + 2500 = 37500 + 2500 = ₹ 40000$$

Labelled price of 150 calculators

$$= 150 \times 320 = ₹ 48000$$

Discount allowed = 5%

\therefore S.P. of 150 calculators

$$= 48000 - 5\% \text{ of } 48000 = ₹ 45600$$

$$\therefore \text{Profit \%} = \frac{5600}{40000} \times 100 = 14$$

$$22. (b) \frac{\text{True weight}}{\text{False weight}} = \frac{100 + \text{gain\%}}{100 + x}$$

Here S.P. = C.P. $\therefore x = 0$

$$\Rightarrow \text{False weight} = \frac{1000 \times 100}{125} = 800 \text{ gm}$$

23. (c) Let cost Price = ₹ 100

\therefore Marked price = ₹ 135

After discount, selling price = $135 - 13.5 = 121.5$

\therefore Profit% = $121.5 - 100 = 21.5\%$

24. (b) Let the C.P. of horse = ₹ x

Then the C.P. of carriage = ₹ (3000 - x)

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

$$\Rightarrow \frac{x}{5} - \frac{(3000 - x)}{10} = 60$$

$$\Rightarrow 2x - 3000 + x = 600$$

$$\Rightarrow 3x = 3600 \Rightarrow x = 1200$$

25. (d) Here, $SP_1 = SP_2$

$$\Rightarrow 140 CP_1 = 60 CP_2 \Rightarrow \frac{CP_1}{CP_2} = \frac{6}{14} = \frac{3}{7}$$

$$\therefore CP_1 = \frac{3}{(3+7)} \times 8000 = ₹ 2400$$

$$\text{and } CP_2 = 8000 - 2400 = ₹ 5600$$

26. (a) Let S.P. = ₹ x per kg

\therefore S.P. of 4 kg = ₹ 4x

$$\therefore 4x \frac{100-10}{100} = 300$$

$$\Rightarrow x = \frac{270}{4} = ₹ 67.50$$

27. (a) Let C.P. of one orange = Re 1

Then C.P. of 8 oranges = ₹ 8

S.P. of 8 oranges = ₹ 9

$$\therefore \text{Gain \%} = \frac{9-8}{8} \times 100 = \frac{100}{8} = 12\frac{1}{2}$$

28. (c) Let C.P. of 1 article = Re 1

then C.P. of 25 articles = ₹ 25

and S.P. of 25 articles = ₹ 20

$$\therefore \text{loss \%} = \frac{25-20}{20} \times 100 = 25\%$$

29. (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

$$\% \text{ gain} = \frac{22}{66} \times 100 = 33\frac{1}{3}\%$$



Shortcut method :

If on selling 'x' articles, a man gains equal to the

C.P. of 'y' articles, then % gain = $\frac{y}{x} \times 100$

$$\therefore \% \text{ gain} = \frac{22}{66} \times 100 = 33\frac{1}{3}\%$$

30. (b) Loss = C.P. of 66 metres – S.P. of 66 metres
 = S.P. of 22 metres
 \Rightarrow C.P. of 66 metres = S.P. of 88 metres

$$\% \text{ loss} = \frac{\text{loss}}{\text{C.P. of 66 metres}} \times 100$$

$$= \frac{\text{S.P. of 22 metres}}{\text{C.P. of 66 metres}} \times 100$$

$$= \frac{\text{S.P. of 22 metres}}{\text{S.P. of 88 metres}} \times 100$$

$$= \frac{22}{88} \times 100 = 25\%$$

31. (b) Equivalent discount = $10 + 20 - \frac{10 \times 20}{100}$
 $= 30 - 2 = 28\%$

32. (b) Let the C.P. of the goods be ₹ 100
 \Rightarrow Marked price of the goods = ₹ 120
 Discount = 10% \Rightarrow S.P. is 90% of ₹ 120 = ₹ 108
 \therefore Gain% = $(108 - 100) = 8\%$.

33. (d) For same article, $\frac{100 - d_1}{100 - d_2} = \frac{100 + g_1}{100 + g_2}$
 $\Rightarrow \frac{100 - 25}{100 - 10} = \frac{100 + 25}{100 + g_2} \Rightarrow \frac{75}{90} = \frac{125}{100 + g_2}$
 $\Rightarrow 100 + g_2 = \frac{90 \times 125}{75} = 150 \Rightarrow g_2 = 50\%$

34. (c) SP = $90 \times 1.2 = ₹ 108$

$$\text{Marked price} = \frac{108}{0.85} = ₹ 127.05$$

35. (d) Let the SP of the article be ₹ x
 Expenses = 15% of x = ₹ 0.15x

$$\text{Profit} = 10\% \text{ of } x = ₹ 0.10x$$

$$\text{CP} = ₹ 9 \text{ (given)}$$

$$\text{Therefore, } 9 + 0.15x + 0.1x = x \Rightarrow x = 12$$

$$\therefore \% \text{ increase for marked price} = \frac{12 - 9}{9} \times 100$$

$$= \frac{100}{3}\%$$

36. (c) $(100 + g_1) : S_1 :: (100 + g_2) : S_2$

$$(100 + 20) : 30 :: (100 + g_2) : 30 \left(1 - \frac{10}{100}\right)$$

[\because 10% discount is

allowed on S.P.]

$$120 : 30 :: (100 + g_2) : 27$$

$$100 + g_2 = \frac{120 \times 27}{30} = 108$$

$$\Rightarrow g_2 = 8\%$$

37. (b) Let C.P. = ₹ 100, Also, let M.P. = ₹ x
 Given, C.P. after 20% discount on M.P. = C.P.
 $\Rightarrow 80\% \text{ of } x = 100$

$$\Rightarrow x = \frac{100 \times 100}{80} = \text{Rs } 125$$

$$\therefore \text{M.P.} = 25\% \text{ above C.P.}$$

38. (c) Real profit % is the profit % on C.P.

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

$$= \frac{20}{100 - 20} \times 100 = 25\%$$

39. (c) Let the C.P. be ₹ 100

$$\text{S.P.} = ₹ 120$$

Discount being 4%, S.P. is 96% of sale price.

$$\therefore 96\% \text{ of sale price} = ₹ 120$$

$$\Rightarrow \text{sale price} = ₹ 120 \times \frac{100}{96} = \text{Rs. } 125$$

$$\therefore \text{Sale price is } 25\% \text{ higher than the C.P.}$$

40. (d) Let his loss = ₹ x. Then,

$$\text{C.P.} = 5000 + x = 5600 - 2x$$

$$\Rightarrow 3x = 600 \Rightarrow x = 200$$

$$\therefore \text{C.P.} = 5000 + 200 = ₹ 5200$$



EXERCISE 3

1. (d) Let x be no. of units.

$$\therefore \text{Profit per unit } x = (60 - 40) x = 20x.$$

Now, additional cost = 3000

\therefore To make a profit of at least ₹ 1000 we have

$$20x - 3000 = 1000 \quad 20x = 4000 \\ x = 200.$$

2. (d) Difference in rupees by increasing the price by rupees 1 is ₹ 350. That means that the quantity of milk is 350 litre. Now, 10 equal containers will become 35 litre per container.

3. (b) Profit, $P = \left(12 - \frac{x}{100}\right)(725 + x)$

$$\text{For maximum } P, \frac{dP}{dx} = 0 \quad x = 237.5$$

$$\text{Taking } x = 237, 725 + 237 = 962$$

$$\text{and } x = 238, 725 + 238 = 963$$

$$\text{However } x = 237.5 \Rightarrow \text{Total } P = 962.5$$

4. (a) Given total profit is 6%

As given the out put of women shirt is 60%

\therefore Mens output would be 40%

\therefore Ratio of the profit of the women's shirt to men's shirt

$$= 3 : 2$$

\therefore Contribution of men's $\frac{2}{5}$ whereas women's $\frac{3}{5}$

Let Average profit in women's shirt be x .

Given, Average profit in Men's shirt is 8%

$$\therefore 6 = \frac{2}{5} \times 8 + \frac{3}{5} \times x$$

$$\Rightarrow x = 4.66$$

\therefore Profit per sales of rupee is 0.0466

5. (c) We have

$$I = C + PQ \text{ where}$$

I = Monthly expense

C = Constant

PQ = Price per quintal

$$\therefore 1000 = C + 250Q \quad \dots(1)$$

$$\text{and } 980 = C + 240Q \quad \dots(2)$$

on solving (1) and (2), we get

$$Q = 2, C = 500$$

$$\text{Required expense} = 500 + 350 \times 2 = 1200$$

6. (b) Let the original price of the jewel be ₹ P and let the profit earned by the third seller be $x\%$.

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

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

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

7. (b) Let C. P. = ₹ x

then profit = S.P. - C. P.

$$\Rightarrow \frac{1}{10} \times x = 891 - x \Rightarrow \frac{11x}{10} = 891$$

$$\Rightarrow x = \frac{891 \times 10}{11} = \text{Rs } 810$$

8. (b) Let S. P. = ₹ x per kg

$$\therefore \text{S.P. of 2 kg of rice} = ₹ 2x = \text{Loss}$$

Now, Loss = C.P. - S.P.

$$2x = 600 - 10x$$

$$\Rightarrow x = ₹ 50 \text{ per kg}$$

9. (a) S.P. of the 1st chair = ₹ 500

Gain = 20%

$$\therefore \text{C.P. of the 1st chair} = \frac{500}{100} \frac{100}{20} = \frac{500}{120}$$

$$\frac{1250}{3}$$

S.P. of the 2nd chair = ₹ 500

Loss = 12%

$$\therefore \text{C.P. of the 2nd chair} = \frac{500}{100} \frac{100}{12} = \frac{500}{88}$$



$$= \frac{500}{22} \times \frac{25}{11} = \frac{250}{11}$$

$$\frac{6250}{11}$$

Now S.P. of both the chairs = ₹ 1000

C.P. of both the chairs

$$\frac{1250}{3} + \frac{6250}{11} = \frac{13750}{33} + \frac{18750}{33} = \frac{32500}{33}$$

$$\text{Net gain} = 1000 - \frac{32500}{33} = \frac{500}{33}$$

$$\Rightarrow \text{Gain \%} = \frac{500/33}{32500/33} \times 100 = \frac{500}{32500} \times 100$$

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

10. (a) Women's shirt comprise 60% of the output.
 \therefore Men's shirts comprise $(100 - 60) = 40\%$ of the output.

$$\therefore \text{Average profit from men's shirt} = 8\% \text{ of } 40 = 3.2$$

out of 40

Overall average profit = 6 out of 100

$$\therefore \text{Average profit from women's shirts} = 2.8 \text{ out of } 60$$

i.e. 0.0466 out of each shirt.

11. (c) Here, in whole transaction, there is neither gains nor loss, therefore,

Amount of gain in one watch

$$= \text{Amount of loss in other watch}$$

$$\Rightarrow 0.15 \times CP_1 = 0.10 \times CP_2$$

$$\Rightarrow \frac{CP_1}{CP_2} = \frac{0.10}{0.15} = \frac{2}{3}$$

$$\text{Also } CP_1 + CP_2 = 560$$

$$\therefore CP_1 = \frac{2}{(2+3)} \times 560 = \text{Rs } 224$$

$$\text{and } CP_2 = 560 - 224 = \text{₹ } 336$$

12. (b) Let the C.P. be ₹ 100

$$\text{First S.P.} = \text{₹ } 115$$

$$\text{Second C.P.} = \text{₹ } 90$$

$$\text{Second S.P.} = 125\% \text{ of } \text{₹ } 90 = \text{₹ } 112.50$$

Difference of two selling prices is ₹ 115 - ₹ 112.50

$$= \text{₹ } 2.50 \text{ and C.P. of the article is } \text{₹ } 100$$

But actual difference is ₹ 4.

$$\therefore \text{C.P.} = \frac{100}{2.50} \times \text{Rs. } 4 = \text{Rs. } 160.$$

13. (a) Let the CP of the article be ₹ x.

$$\text{Then, SP} = \text{₹ } \frac{105x}{100}$$

$$\text{Now, new CP} = \text{₹ } \frac{95x}{100} \text{ and new SP} = \frac{105x}{100} - 1$$

According to the question

$$\frac{105x}{100} - 1 - \frac{95x}{100} = \frac{10 \times 95x}{100 \times 100}$$

$$\therefore x = \text{₹ } 200$$

14. (c) Retailer price = list price $\left(1 - \frac{d_1}{100}\right) \left(1 - \frac{d_2}{100}\right)$

$$\Rightarrow 122.40 = 160 \left(1 - \frac{10}{100}\right) \left(1 - \frac{d_2}{100}\right)$$

$$\Rightarrow 1 - \frac{d_2}{100} = \frac{122.40 \times 100}{160 \times 90} = 0.85$$

$$\Rightarrow d_2 = (1 - 0.85) \times 100 = 15\%$$

15. (a) Retailer's price = 112 % of 110% of (120 % of 25)

$$= \frac{112}{100} \times \frac{110}{100} \times \frac{120}{100} \times 25 = \text{Rs } 36.96 \approx \text{Rs } 37$$

16. (c) Let C.P. = ₹ x

$$120\% \text{ of } \frac{225}{2} \% \text{ of } x = 2700$$

$$\Rightarrow \frac{120}{100} \times \frac{225}{2} \times \frac{x}{100} = 2700$$

$$\Rightarrow x = 2000$$

17. (b) Let C.P. = ₹ 100. Then, marked price = ₹ 150.

$$\text{S.P.} = 75\% \text{ of } \text{₹ } 150 = \text{₹ } 112.50$$

$$\therefore \text{Gain \%} = 12.50\%$$



18. (d) C.P. of $\frac{1}{4}$ th. of goods = $\frac{1}{4} \times ₹ 840 = ₹ 210$

S.P. of these goods = 80% of ₹ 210 = ₹ 168

Remaining cost of the goods = ₹ 840 – ₹ 210
= ₹ 630

Over all S.P. of the goods = 120% of ₹ 840 = ₹ 1008

∴ Remaining goods must be sold for ₹ 1008 – ₹ 168 = ₹ 840

$$\text{Gain \%} = \frac{210}{630} \times 100 = 33\frac{1}{3}\%$$

19. (c) Let the C.P. for the manufacturer be ₹ 100.

Then, C.P. for the wholesaler = ₹ 118

C.P. for the retailer = 118 + 20% of 118 = ₹ 141.60

C.P. for the customer = 141.60 + 141.60 × $\frac{25}{100}$ =
₹ 177

∴ If the C.P. for the customer is ₹ 177, then the C.P. for the manufacturer is ₹ 100.

If the C.P. for the customer is ₹ 30.09, then the

C.P. for manufacturer is $\frac{100}{177} \times 30.09 = ₹ 17$

20. (a) Let the CP of the sunglasses be ₹ 100.

Now, SP = ₹ 125

New CP = ₹ 75

New SP = 75 × 1.4 = ₹ 105

Thus, if he sells for ₹ (125 – 105) = 20 less, then

CP = 100

If he sells for ₹ 10 less, then

$$\text{CP} = \frac{100}{20} \times 10 = \text{Rs } 50$$

21. (c) Let the price of first grade cycles be ₹ x each and that of second grade cycles be ₹ y each.

Now, $8x + 22y = 3150$

Let he sells A grade cycle at a rate of ₹ z per bicycle. Then,

$$8z + \frac{22 \times 3}{4} z = 3150 \times 1.4$$

or $32z + 66z = 17640$

or $98z = 17640$ or $z = 180$

He should sell the first grade bicycles at a rate of ₹ 180.

22. (b) Let the CP of a pen and a book be ₹ x and ₹ y, respectively.

$$0.95x + 1.15y = (x + y) + 7$$

or $0.15y - 0.05x = 7$

..... (1)

and $1.05x + 1.1y = (x + y) + 13$

or $0.05x + 0.1y = 13$

..... (2)

Solving (1) and (2),

We get, $y = ₹ 80$

23. (d) CP of 3500 cassettes = ₹ 3,50,000

SP of each set of 30 (29 + 1) cassettes

$$\text{Rs. } 29 \times 150 \times \frac{75}{100}$$

= ₹ 29 × 112.50 = ₹ 3262.50

∴ SP of 3500 cassettes including 500 free cassettes = 3262.50 × 100 = ₹ 3,26,250

Overall loss = ₹ 3,50,000 – ₹ 3,26,250 = ₹ 23750

$$\therefore \% \text{ loss} = \frac{23750}{350000} \times 100 = 6.8$$