



ANSWER KEY & SOLUTIONS

PROFIT & LOSS



1. $\% \text{ gain} = \frac{18 - 15}{15} \times 100 = 20\%$

2. $\frac{11}{10} \times \frac{10}{11}$
 $\frac{11 \times 11 - 10 \times 10}{10 \times 10} \times 100\%$
 = 21 % profit, since sign is positive

3. $\% \text{ gain} = \frac{\text{True wt} - \text{False wt}}{\text{False wt}} \times 100$
 $= \frac{1000 - 875}{875} \times 100 = \frac{100}{7} = 14\frac{2}{7}\%$

4. When he added $\frac{1}{3}$ of water, cost of one litre of impure milk

$$= 60P \left(\frac{3}{4} \right) = 45P \text{ ----- (*)}$$

$$\therefore \% \text{ profit} = \frac{72 - 45}{45} \times 100 = 60\%$$

Note: (*) Quantity of milk = $1 + \frac{1}{3} = \frac{4}{3}$ litre

$\frac{4}{3}$ litre cost 60 P. By rule of fraction 1litre will cost less than 60;

Hence we multiple 60 by less- than – one fraction i.e. $\frac{3}{4}$.

5. By rule of fraction:

$$SP = 120 \left(\frac{85}{100} \right) = \text{Rs.} 102.$$

6. By rule of fraction: $15 \left(\frac{100}{125} \right) = 12$

7. By rule of fraction:

$$\text{Cost price} = 279 \left(\frac{100}{100 - 7} \right) = \text{Rs } 300$$

8. There is always loss in such case and loss % = $\frac{10^2}{100} \% = 1\%$

9. By rule of fraction: $153 \left(\frac{100}{90} \right) \left(\frac{120}{100} \right) = \text{Rs } 204$

10. $CP = 240 \left(\frac{100}{125} \right) = \text{Rs. } 192.$

$$\therefore \% \text{ profit} = \frac{216 - 192}{192} \times 100 = \frac{25}{2} = 12\frac{1}{2}\%$$

11. Let the cost price be Rs. 100.

$$\frac{2}{3} \text{ of original SP} = 100 - 20\% \text{ of } 100 = \text{Rs. } 80 \therefore \text{Original SP} = \frac{80 \times 3}{2} \text{ Rs. } 120$$

$$\therefore \% \text{ profit} = \frac{120 - 100}{100} \times 100 = 20\%$$

RACE Method:

$$\% \text{ profit or loss} = \left[\frac{100 - 20}{\frac{2}{3}} - 100 \right] \% \text{ profit or loss according to +ve}$$

$$\text{or negative sign.} = \frac{80}{2} - 100 = 20\%$$

12. **By the rule of fraction:**

He must have purchased less number of oranges for a rupee, as he bears a loss. Therefore, no. of

$$\text{oranges purchased for a rupee} = 32 \left(\frac{60}{100} \right) \left(\frac{100}{120} \right) = 16$$

13. Suppose he invested Rs. 16×12

$$\text{Then CP of 1 article} = \text{Rs. } \frac{16 \times 12}{16} = \text{Rs. } 12$$

$$\text{And SP of 1 article} = \text{Rs. } \frac{16 \times 12}{12} = \text{Rs. } 16$$

$$\therefore \% \text{ profit} = \frac{16 - 12}{12} \times 100 = \frac{100}{3} = 33\frac{1}{3}\%$$

RACE Method:

$$\% \text{ profit} = \left(\frac{\text{No. of purchased goods} - \text{No. of sold goods}}{\text{No. of sold goods}} \right) \times 100$$

$$\text{In this case, } \frac{16 - 12}{12} \times 100 = 33\frac{1}{3}\%$$

14. Suppose the S.P. per metre = Re 1

$$\text{Then S.P. of 33 metres} = \text{Rs } 33$$

$$\text{Profit} = \text{Rs } 11$$

$$\therefore \text{C.P. of 33 metres} = 33 - 11 = \text{Rs. } 22$$

$$\therefore \text{Profit} = \frac{11}{22} \times 100 = 50\%$$

$$\text{RACE Method: } \% \text{ profit} = \frac{11}{33 - 11} \times 100 = 50\%$$

Note: For the above two questions never use the detailed method. Remember the direct formula and its usage.

15. Difference in 5% profit = Diff. in Rs. 10 profit

$$\therefore 100\% = \frac{10}{5} \times 100 = \text{Rs. } 200.$$

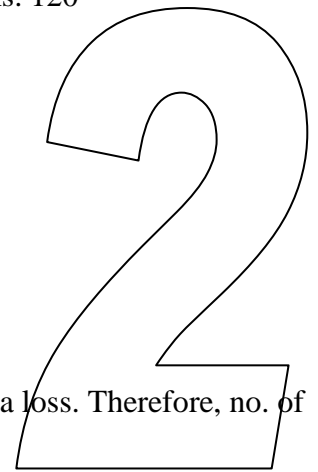
RACE Method:

$$\text{Cost price} = \frac{100 \text{ Diff. in S.P.}}{\text{Diff. in profit}\%} = \frac{100 \cdot 350 - 340}{5} = \text{Rs. } 200$$

16. Let C.P. = Rs. x /dozen = Rs. $\frac{100x}{12}$ per hundred and S.P. $8x$ /hundred

$$\therefore \% \text{ profit} = \frac{8x - \frac{100x}{12}}{\frac{100x}{12}} \times 100 = \frac{96x - 100x}{12 \times 100x} \times 100 \times 12 = -4\%$$

-ve sign shown that there is loss of 4%.



RACE Method:

$$\% \text{ profit or loss} = 8 \times \text{dozen} - \text{Hundred} = 96 - 100 = -4\%$$

17. Use the **Direct Formula** $\% \text{ profit} = 20 - 10 - \frac{20 \times 10}{100} = 20 - 10 - 2 = 8\%$

18. Single equivalent discount $= 10 + 15 - \frac{10 \times 15}{100}$
 \therefore CP for the shopkeeper $= 200 - 23.5\% \text{ of } 200 = \text{Rs. } 153$

$$\text{Profit \%} = \frac{208 - 160}{160} \times 100 = 30\%$$

RACE Method:

$$\text{C.P.} = 200 \left(\frac{90}{100} \right) \left(\frac{85}{100} \right) = \text{Rs } 153$$

$$\text{Total cost} = 153 + 7 = \text{Rs. } 160$$

$$\% \text{ profit} = \frac{208 - 160}{160} \times 100 = 30\%$$

19. $x + x\% \text{ of } x = 75$
 or, $x^2 + 100x - 7500 = 0$
 or, $(x + 50)(x + 150) = 0$

$$\therefore x = 50 \text{ or } -150$$

Neglecting the -ve value, the CP = Rs. 50.

20. CP of 7 pencils is Rs.5
 SP of 7 pencils is Rs. $\frac{8}{9} \times 7 = \text{Rs. } \frac{56}{9}$
 \therefore Profit on 7 pencils $= \frac{56 - 45}{9} = \text{Rs. } \frac{11}{9}$
 \therefore Total pencils $= \frac{7 \times 9}{11} \times 44 = 252$

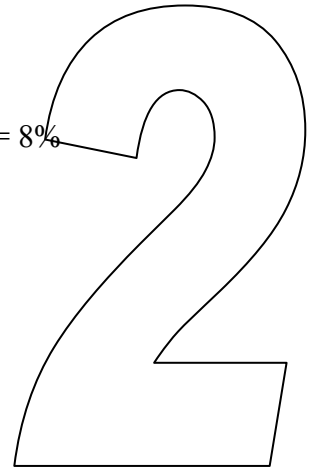
21. Let CP of 1000 gm = Rs. 100
 SP of 800 gm = $100 + 20\% \text{ of } 100 = \text{Rs. } 120$
 or, SP of 1000 gm $= \frac{120}{800} \times 1000 = \text{RS. } 150$
 \therefore % profit $= \frac{150 - 100}{100} \times 100 = 50\%$

RACE Method:

$$\% \text{ profit} = (100 + \% \text{ profit}) \left(\frac{\text{True weight}}{\text{False weight}} \right) - 100$$

$$= 120 \left(\frac{1000}{800} \right) - 100 = 50\%$$

22. Let CP of 1000 gm = Rs. 100
 SP of 750 gm = Rs. 90 (as there is 10% loss)
 or, SP of 1000 gm $= \frac{90}{750} \times 1000 = \text{Rs. } 120$
 \therefore % profit $= \frac{120 - 100}{100} \times 100 = \text{Rs. } 20\%$



RACE Method:

$$\% \text{ profit or loss} = (100 - 10) \left(\frac{1000}{750} \right) - 100 = 20\%$$

Since sign is +ve, there is profit of 20%



23. **By Rule of fraction:** $SP = 1 \left(\frac{100}{110} \right) \left(\frac{121}{100} \right) = \text{Rs. } 1.10$

\therefore he must raise the price by 0.1 rupee or 10 paise.

24. Suppose he has x litre of milk in total.

$$\text{Thus we have } 5x + 200 = 6x - 150$$

$$\text{or, } x(6 - 5) = 200 + 150$$

$$\therefore x = 350 \text{ litres.}$$

$$\therefore \text{ each vessel contains } \frac{350}{10} = 35 \text{ litres.}$$

RACE Method:

$$\text{Total quantity of milk} = \frac{\text{Difference in Amount}}{\text{Difference in Rates}} = \frac{150 - (-200)}{6 - 5} = 350 \text{ litres.}$$

Note: Difference in amount = Gain + loss = $150 + 200 = 350$

25. **By Rule Method:**

$$\text{First Purchased for } 250 \left(\frac{100}{125} \right) \left(\frac{100}{125} \right) \left(\frac{100}{125} \right)$$

$$= 250 \left(\frac{4}{5} \right) \left(\frac{4}{5} \right) \left(\frac{4}{5} \right) = \text{Rs. } 128$$

26. $\text{Cost Price} = \frac{\text{Selling price}}{1 - \frac{1}{7}} = \frac{60 \times 7}{6} = \text{Rs. } 70$

$$\therefore \% \text{ profit} = \frac{77 - 70}{70} \times 100 = 10\%$$

27. **RACE Method:**

$$\text{Cost Price} = \frac{7.5 \times 100}{\text{Difference in \% profit}} = \frac{7.5 \times 100}{22 - 7} = \text{Rs. } 50$$

28. He purchases 64 more bananas for 40% of Rs.40 or, Rs 16.

$$\therefore \text{Reduced price per dozen} = \frac{16}{64} \times 12 = \text{Rs. } 3.$$

29. Let the listed price = Rs. 100

$$\text{Then, CP} = \frac{3}{4} \times 100 = \text{Rs. } 75 \text{ and SP} = \frac{3}{2} \times 100 = \text{Rs. } 150$$

$$\therefore \% \text{ profit} = \frac{150 - 75}{75} \times 100 = 100\%$$

RACE Method:

$$\% \text{ profit} = \frac{\left(1 + \frac{1}{2} \right) - \frac{3}{4}}{\frac{3}{4}} \times 100 = 100\%$$

30. **By the rule of fraction:**

$$\text{He purchased } 15 \left(\frac{100 - 9}{100} \right) \text{ for a rupee.}$$

$$\text{Now to gain } 5\%, \text{ he must sell } 15 \left(\frac{91}{100} \right) \left(\frac{100}{105} \right) = 13 \text{ for a rupee.}$$

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