

EXPLANATIONS

TYPE-I

1. (2) Using Rule 5,
Successive discounts of 36% and 4% is overall equals to

$$= \left(36 + 4 - \frac{36 \times 4}{100} \right) \%$$

$$= 38.56\%$$

$$\therefore \text{Percentage difference} = 40 - 38.56$$

$$= 1.44\%$$

Difference between discount

$$= 1.44\% \text{ of } 100000$$

$$= \frac{1.44 \times 100000}{100} = ₹ 1440$$

2. (4) Using Rule 5,
Equivalent discount

$$= 30 + 10 - \frac{30 \times 10}{100} = 37\%$$

3. (3) Marked price = ₹ 720
Actual price = ₹ 550.80
First discount = 10%
Let the second discount be x%
Then, we can write
 $720(1 - 0.10)(1 - 0.01x) = 550.80$
 $\Rightarrow 720 \times 0.9(1 - 0.01x) = 550.8$
 $\Rightarrow 648(1 - 0.01x) = 550.8$

$$\Rightarrow 1 - 0.01x = \frac{550.8}{648}$$

$$0.01x = 1 - \frac{550.8}{648}$$

$$x = \frac{1 - 0.85}{0.01}$$

$$x = 0.15 \times 100$$

$$x = 15$$

$$\therefore \text{Second discount} = 15\%$$

4. (2) Price after 10% first discount

$$= 1000 \times \frac{100 - 10}{100}$$

$$= 1000 \times \frac{90}{100} = ₹ 900$$

Given :

Price after second discount

$$= ₹ 810$$

$$\therefore \text{Second discount}$$

$$= 900 - 810 = ₹ 90$$

$$\therefore \text{Percentage of second discount}$$

$$= \frac{90 \times 100}{900} = 10\%$$

5. (3) Using Rule 5,
Successive discounts of x% and y%

$$= \left(x + y - \frac{x \times y}{100} \right) \%$$

$$\therefore \text{Required discount}$$

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \%$$

$$= 30 - 2 = 28\%$$

6. (3) **Trick :**

Equivalent discount

$$= \left(15 + 10 - \frac{15 \times 10}{100} \right) \% = 23.5\%$$

7. (3) Equivalent discount of successive discounts of 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \% = 28\%$$

$$\therefore \text{Selling Price} = (100 - 28) \% \text{ of } ₹ 500 = 72 \% \text{ of } 500$$

$$= ₹ \frac{500 \times 72}{100} = ₹ 360$$

Aliter : Using Rule 3,

$$\text{M.P.} = \text{Rs. } 500$$

$$D_1 = 20\%$$

$$D_2 = 10\%$$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$= 500 \left(\frac{100 - 20}{100} \right) \left(\frac{100 - 10}{100} \right)$$

$$= 500 \times \frac{80}{100} \times \frac{90}{100} = \text{Rs. } 360$$

8. (1) A single discount equal to the two successive discounts

$$= \left(10 + 5 - \frac{10 \times 5}{100} \right) \% = 14.5\%$$

$$\therefore \text{Selling price of the article}$$

$$= 85.5\% \text{ of } ₹ 240$$

$$= ₹ \frac{85.5 \times 240}{100} = ₹ 205.20$$

Aliter : Using Rule 3,

$$\text{Here, M.P.} = \text{Rs. } 240,$$

$$D_1 = 10\%, D_2 = 5\%$$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$= 240 \left(\frac{100 - 10}{100} \right) \left(\frac{100 - 5}{100} \right)$$

$$= 240 \times \frac{90}{100} \times \frac{95}{100}$$

$$= \text{Rs. } 205.20$$

9. (2) Using Rule 5,
Let the original price be ₹ 100
 \therefore Increased price = ₹ 130
Equivalent discount

$$= \left(10 + 10 - \frac{10 \times 10}{100} \right) = 19\%$$

$$\therefore \text{Ultimate price of the article} = 81\% \text{ of } 130 = 105.3 \text{ i.e. increase by } 5.3\%.$$

10. (3) Single of discount for successive discounts 10% and 20%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \% = 28\%$$

$$\therefore \text{Equivalent discount for discounts } 28\% \text{ and } 25\%$$

$$= \left(28 + 25 - \frac{28 \times 25}{100} \right) \%$$

$$= 53 - 7 = 46\%$$

Aliter : Using Rule 4,

Single equivalent discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 10}{100} \right) \left(\frac{100 - 20}{100} \right) \left(\frac{100 - 25}{100} \right) \times 100 \right]$$

$$= 100 - \frac{90}{100} \times \frac{80}{100} \times \frac{75}{100} \times 100$$

$$= 100 - 54 = 46\%$$

11. (3) Equivalent discount for successive discounts of 20% and 10%

$$= \left[20 + 10 - \frac{20 \times 10}{100} \right] \%$$

$$= 28\%$$

$$\therefore \text{Net selling price} = 72\% \text{ of } 2000$$

$$= ₹ \frac{72 \times 2000}{100} = ₹ 1440$$

Aliter : Using Rule 3,

$$\text{Here, M.P.} = ₹ 2000,$$

$$D_1 = 20\%, D_2 = 10\%$$

$$\text{S.P.} = \text{M.P.} \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \right]$$

$$= \left[2000 \times \left(\frac{100 - 20}{100} \right) \times \left(\frac{100 - 10}{100} \right) \right]$$

$$= 2000 \times \frac{80 \times 90}{10000} = ₹ 1440$$

DISCOUNT

12. (2) Using Rule 5,

Case I : A single discount of 30%

Case II : Two successive discounts of 20% and 10%

Single equivalent discount

$$= (20 + 10 - \frac{20 \times 10}{100}) \% = 28\%$$

$$\text{Difference} = (30 - 28)\% = 2\%$$

\therefore Required difference

$$= 2\% \text{ of } 550$$

$$= ₹ \frac{2 \times 550}{100} = ₹ 11.$$

13. (3) Let the second discount be $x\%$.

Then, 90 % of $(100 - x)\%$ of 800

= 612

$$\Rightarrow \frac{90}{100} \times \frac{100 - x}{100} \times 800 = 612$$

$$\Rightarrow 100 - x = \frac{612 \times 100}{90 \times 8} = 85$$

$$\Rightarrow x = 100 - 85 = 15\%$$

Aliter : Using Rule 3,

Here, M.P. = Rs. 800, S.P. = Rs.

612, $D_1 = 10\%$, $D_2 = ?$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$612 = 800 \times \left(\frac{100 - 10}{100} \right) \times \left(\frac{100 - D_2}{100} \right)$$

$$612 = 800 \times \frac{90}{100} \times \frac{100 - D_2}{100}$$

$$\frac{6120}{72} = 100 - D_2$$

$$D_2 = \frac{100 - 6120}{72}$$

$$= \frac{7200 - 6120}{72} = 15\%$$

14. (3) Let 'x' be the marked price

Single Discount = 15%

$$\Rightarrow 100 - 15 = 85$$

$$85\% \text{ of } x = 17,000$$

$$\therefore x = \frac{17,000}{85} \times 100$$

$$= ₹ 20,000$$

Required SP

$$= 20,000 \times \frac{95}{100} \times \frac{90}{100}$$

$$= 180 \times 95 = ₹ 17100$$

Aliter : Using Rule 2 and Rule 3,

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$= \frac{17000 \times 100}{100 - 15}$$

$$= \frac{17000 \times 100}{85}$$

$$\text{M.P.} = 20000$$

Also, S.P.

$$= \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$= 20000 \left(\frac{100 - 5}{100} \right) \left(\frac{100 - 10}{100} \right)$$

$$= 20000 \times \frac{95}{100} \times \frac{90}{100}$$

$$= 180 \times 95 = ₹ 17100$$

15. (3) Marked price = ₹ 160

After 10% discount

$$\text{S.P.} = \frac{90}{100} \times 160 = ₹ 144$$

Let other discount = $x\%$

$$\therefore \frac{(100 - x)}{100} \times 144 = ₹ 122.40$$

$$\Rightarrow 100 - x = \frac{12240}{144}$$

$$\Rightarrow 100 - x = 85$$

$$\Rightarrow x = 100 - 85 = 15\%$$

Aliter : Using Rule 3,

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$122.40 = 160 \left(\frac{100 - 10}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$\frac{1224000}{160} = 90 \times \left(\frac{100 - D_2}{100} \right)$$

$$\frac{1224000}{160 \times 90} = 100 - D_2$$

$$85 = 100 - D_2$$

$$\Rightarrow D_2 = 15\%$$

16. (4) Let the second discount be x per cent.

According to the question,

$$450 \times \frac{100 - 10}{100} \times \frac{100 - x}{100}$$

$$= 344.25$$

$$\therefore 100 - x$$

$$= \frac{344.25 \times 100 \times 100}{450 \times 90}$$

$$\therefore 100 - x = 85$$

$$\therefore x = 100 - 85 = 15\%.$$

Aliter : Using Rule 3,

Here, M.P. = Rs. 450, S.P.

= Rs. 344.25, $D_1 = 10\%$, $D_2 = ?$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$344.25 = 450 \times \left(\frac{100 - 10}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$\frac{3442500}{450 \times 90} = (100 - D_2)$$

$$85 = 100 - D_2$$

$$\Rightarrow D_2 = 15\%$$

17. (3) Using Rule 5,

(i) : Equivalent discount

$$= \left(25 + 15 - \frac{25 \times 15}{100} \right) \%$$

$$= (40 - 3.75) \% = 36.25\%$$

(ii) : Equivalent discount

$$= \left(30 + 10 - \frac{30 \times 10}{100} \right) \%$$

$$= (40 - 3) \% = 37\%$$

(iii) : Equivalent discount

$$= \left(35 + 5 - \frac{35 \times 5}{100} \right) \%$$

$$= (40 - 1.75) \% = 38.25\%$$

Clearly, third offer is best for a customer.

18. (2) Using Rule 5,

Equivalent discount for two successive discounts of 8% and 8%

$$= \left(8 + 8 - \frac{8 \times 8}{100} \right) \%$$

$$= (16 - 0.64) \% = 15.36 \%$$

$$\therefore \text{SP} = (100 - 15.36) \% \text{ of } 900$$

$$= ₹ \left(\frac{84.64 \times 900}{100} \right) = ₹ 761.76$$

For a single discount of 16%,

SP = 84% of 900

$$= ₹ \left(\frac{84 \times 900}{100} \right) = ₹ 756$$

Certainly seller will lose in this case.

$$\therefore \text{Loss} = ₹ (761.76 - 756)$$

$$= ₹ 5.76$$

19. (3) Equivalent discount

$$= 10 + 5 - \frac{10 \times 5}{100} = 14.5 \%$$

\therefore CP (for buyer)

$$= 85.5\% \text{ of } ₹ 200000$$

DISCOUNT

$$= ₹ \left(\frac{85.5 \times 200000}{100} \right) = ₹ 171000$$

$$SP = ₹ 179550$$

$$\text{Gain} = ₹ (179550 - 171000)$$

$$= ₹ 8550$$

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

$$= \frac{8550}{171000} \times 100 = 5\%$$

Aliter : Using Rule 3,

Here, M.P. = 200000, S.P. is C.P. byer for

$$D_1 = 5\%,$$

$$D_2 = 10\%$$

$$S.P. = M.P. \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$= 200000 \left(\frac{100 - 5}{100} \right) \left(\frac{100 - 10}{100} \right)$$

$$= 20 \times 95 \times 90$$

$$\text{C.P. for buyer} = 171000$$

$$S.P. = 179550$$

$$\text{Profit} = S.P. - \frac{C.P.}{C.P.} \times 100\%$$

$$= \frac{8550}{171000} \times 100 = 5\%$$

20. (4) Using Rule 5,

Effective discount

$$= 25 + 15 - \frac{25 \times 15}{100}$$

$$= 40 - 3.75 = 36.25 \%$$

$$\therefore \text{CP for buyer}$$

$$= (100 - 36.25) \% \text{ of } 800$$

$$= \frac{63.75 \times 800}{100} = ₹ 510$$

$$\therefore \text{To gain } 20\%,$$

$$SP = ₹ \left(\frac{120 \times 510}{100} \right) = ₹ 612$$

$$\text{Let the list price be } ₹ x.$$

$$\therefore 90\% \text{ of } x = ₹ 612$$

$$\Rightarrow \frac{90x}{100} = 612 \Rightarrow x = \frac{61200}{90}$$

$$= ₹ 680$$

21. (4) Using Rule 5,

Single equivalent discount of two successive discounts of 36% and

$$4\% = 36 + 4 - \frac{36 \times 4}{100}$$

$$= 40 - 1.44 = 38.56$$

$$\text{Percentage difference}$$

$$= 40 - 38.56 = 1.44$$

\therefore Required difference

$$= 500 \times \frac{1.44}{100} = ₹ 7.20$$

22. (2) Total discount

$$= ₹ (920 - 742.90)$$

$$= ₹ 177.10$$

$$\text{First discount} = 15\%$$

$$\therefore \text{Discount} = 15\% \text{ of } 920$$

$$= \frac{920 \times 15}{100} = ₹ 138$$

$$\text{Price after this discount}$$

$$= 920 - 138 = ₹ 782$$

$$\text{Remaining discount}$$

$$= 177.10 - 138 = ₹ 39.10$$

$$\text{Let the second discount be } x\%.$$

$$\therefore \frac{782 \times x}{100} = 39.10$$

$$\Rightarrow x = \frac{39.10 \times 100}{782} = 5\%$$

Aliter : Using Rule 3,

Here, M.P. = Rs. 920, S.P. = Rs. 742.90

$$D_1 = 15\%, D_2 = ?$$

$$S.P. = M.P. \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$742.90$$

$$= 920 \left(\frac{100 - 15}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$\frac{7429000}{920 \times 85} = 100 - D_2$$

$$95 = 100 - D_2$$

$$\Rightarrow D_2 = 5\%$$

23. (3) Total discount

$$= ₹ (820 - 570.72) = ₹ 249.28$$

$$\text{First discount} = 820 \times \frac{20}{100} = ₹ 164$$

$$\therefore \text{Second discount}$$

$$= ₹ (249.28 - 164) = ₹ 85.28$$

$$\text{Price of the article after first discount} = ₹ (820 - 164) = ₹ 656$$

$$\text{If the second discount be } x\%, \text{ then}$$

$$x\% \text{ of } 656 = 85.28$$

$$\Rightarrow x = \frac{85.28 \times 100}{656} = 13\%$$

Aliter : Using Rule 3,

Here, M.P. = Rs. 820, S.P. = 570.72, $D_1 = 20\%$, $D_2 = ?$

$$S.P. = M.P. \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$570.72 = 820 \left(\frac{100 - 20}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$\frac{5707200}{820 \times 80} = 100 - D_2$$

$$100 - D_2 = 87$$

$$D_2 = 13\%$$

24. (1) Using Rule 5,

Single equivalent discount for two successive discounts of 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \% = 28\%$$

Now, single discount for 28% and

$$5\% = \left(28 + 5 - \frac{28 \times 5}{100} \right) \%$$

$$= (33 - 1.4) \% = 31.6\%$$

\therefore Required selling price of bicycle at cash payment

$$= (100 - 31.6) \% \text{ of } ₹ 2000$$

$$= \frac{2000 \times 68.4}{100} = ₹ 1368$$

25. (1) Using Rule 5,

Single equivalent discount of two consecutive discount of 30% and 10%

$$= 30 + 10 - \frac{30 \times 10}{100} = 37\%$$

\therefore Required difference = 40% of

$$500 - 37\% \text{ of } 500$$

$$= 3\% \text{ of } 500$$

$$= 500 \times \frac{3}{100} = ₹ 15$$

26. (4) After a discount of 5%

$$SP = \frac{95 \times 16000}{100} = ₹ 15200$$

Let the second discount be $x\%$.

$$\therefore x\% \text{ of } 15200$$

$$= (15200 - 11400)$$

$$\Rightarrow \frac{x \times 15200}{100} = 3800$$

$$\Rightarrow x = \frac{3800 \times 100}{15200} = 25$$

$$\therefore \text{Second discount} = 25\%$$

Aliter : Using Rule 3,

Here, M.P. = 16000,

DISCOUNT

$$\text{S.P.} = 11400, D_1 = 5\%, D_2 = ?$$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$11400 = 16000 \left(\frac{100 - 5}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$\frac{114000}{16 \times 95} = 100 - D_2$$

$$75 = 100 - D_2$$

$$D_2 = 25\%$$

27. (3) Using Rule 5,

Case I,

$$\text{Discount} = \frac{30 \times 2000}{100} = ₹ 600$$

Single equivalent discount for discounts of 25% and 5%.

$$= \left(25 + 5 - \frac{25 \times 5}{100} \right)\%$$

$$= (30 - 1.25)\% = 28.75\%$$

$$\therefore \text{Discount} = \frac{28.75 \times 2000}{100}$$

$$= ₹ 575$$

$$\therefore \text{Difference} = ₹ (600 - 575)$$

$$= ₹ 25$$

28. (1) Using Rule 5,

Let the marked price be ₹ x .

$$\therefore \text{In case I, SP} = ₹ \frac{70x}{100}$$

Single discount equivalent to successive discounts of 20% and 10%.

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right)\% = 28\%$$

$$\therefore \text{S.P. in this case} = \frac{72x}{100}$$

$$\therefore \frac{72x}{100} - \frac{70x}{100} = 72$$

$$\Rightarrow \frac{2x}{100} = 72$$

$$\therefore x = \frac{72 \times 100}{2} = ₹ 3600$$

29. (2) Using Rule 5,

Single equivalent discount for successive discounts of 10% and 20%.

$$= \left(10 + 20 - \frac{20 \times 10}{100} \right)\% = 28\%$$

Single equivalent discount for 28% and 30%.

$$= \left(28 + 30 - \frac{28 \times 30}{100} \right)\% = 49.6\%$$

30. (3) Using Rule 5,

Equivalent single discount

$$= \left(20 + 20 - \frac{20 \times 20}{100} \right)\% = 36\%$$

31. (3) Using Rule 5,

Single equivalent discount

$$= \left(10 + 5 - \frac{10 \times 5}{100} \right)\%$$

$$= (15 - 0.5)\% = 14.5\%$$

32. (2) Using Rule 5,

Single equivalent discount

$$= \left(x + y - \frac{xy}{100} \right)\%$$

$$= \left(20 + 15 - \frac{20 \times 15}{100} \right)\% = 32\%$$

33. (2) Single equivalent discount for 10% and 12%.

$$= \left(12 + 10 - \frac{12 \times 10}{100} \right)\% = 20.8\%$$

Single equivalent discount for 20.8% and 5%.

$$= \left(20.8 + 5 - \frac{20.8 \times 5}{100} \right)\%$$

$$= 24.76\%$$

Aliter : Using Rule 4,

Here, $D_1 = 10\%$, $D_2 = 12\%$, $D_3 = 5\%$

Single equivalent discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 10}{100} \right) \left(\frac{100 - 12}{100} \right) \left(\frac{100 - 5}{100} \right) \times 100 \right]$$

$$= 100 - \frac{90}{100} \times \frac{88}{100} \times \frac{95}{100} \times 100$$

$$= 100 - 75.24 = 24.76\%$$

34. (2) Using Rule 5 and Rule 2,

Single equivalent discount

$$= \left(5 + 10 - \frac{10 \times 5}{100} \right)\% = 14.5\%$$

\therefore Cost of article after discount

$$= \frac{850 \times (100 - 14.5)}{100} = ₹ 726.75$$

35. (3) Using Rule 5,

Single equivalent discount

$$= \left(15 + 10 - \frac{15 \times 10}{100} \right)\% = 23.5\%$$

$$\therefore \text{Cost price} = \frac{800 \times 76.5}{100}$$

$$= ₹ 612$$

$$\text{Actual C.P.} = ₹ (612 + 28)$$

$$= ₹ 640$$

$$\therefore \text{Gain \%} = \frac{800 - 640}{640} \times 100$$

$$= \frac{160 \times 100}{640} = 25\%$$

36. (2) Single equivalent discount for 10% and 20%

$$= 10 + 20 - \frac{20 \times 10}{100} = 28\%$$

Single equivalent discount for 28% and 40%

$$= \left(40 + 28 - \frac{28 \times 40}{100} \right)\%$$

$$= (68 - 11.2)\% = 56.8\%$$

Aliter : Using Rule 4,

Here, $D_1 = 10\%$, $D_2 = 20\%$, $D_3 = 40\%$

Single discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left(\frac{100 - 10}{100} \right) \times \left(\frac{100 - 20}{100} \right) \times \left(\frac{100 - 40}{100} \right) \times 100$$

$$= 100 - \frac{90}{100} \times \frac{80}{100} \times \frac{60}{100} \times 100$$

$$= 100 - 43.20 = 56.8\%$$

37. (4) Using Rule 5,

Single equivalent discount

$$= \left(25 + 10 - \frac{25 \times 10}{100} \right)\%$$

$$= 32.5\%$$

38. (1) Using Rule 5,

Equivalent single discount

$$= \left(x + y - \frac{xy}{100} \right)\%$$

$$= \left(20 + 5 - \frac{20 \times 5}{100} \right)\%$$

$$= (25 - 1)\% = 24\%$$

DISCOUNT

39. (4) Using Rule 5,

Single equivalent discount of two successive discounts of 20% each

$$= \left(20 + 20 - \frac{20 \times 20}{100} \right) \%$$

$$= 36\%$$

If the amount of the bill be x , then

$$\therefore (36 - 35)\% \text{ of } x = 22$$

$$\Rightarrow \frac{x}{100} = 22 \Rightarrow x = ₹ 2200$$

40. (3) S.P. after first discount

$$= \frac{1600 \times 90}{100} = ₹ 1440$$

\therefore Second discount

$$= 1440 - 1224 = ₹ 216$$

$$\therefore \frac{1440 \times x}{100} = 216$$

$$\therefore x = \frac{216 \times 100}{1440} = 15\%$$

41. (3) Single equivalent discount for 20% and 20%

$$= \left(20 + 20 - \frac{20 \times 20}{100} \right) \% = 36\%$$

Single equivalent discount for 36% and 10%

$$= \left(36 + 10 - \frac{36 \times 10}{100} \right) \% = 42.4\%$$

Aliter : Using Rule 4,

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 20}{100} \right) \times \left(\frac{100 - 20}{100} \right) \times \left(\frac{100 - 10}{100} \right) \times 100 \right]$$

$$= 100 - \frac{80}{100} \times \frac{80}{100} \times \frac{90}{100} \times 100$$

$$= 100 - 57.60 = 42.40$$

42. (2) Using Rule 5,

Single equivalent discount

$$= \left(10 + 10 - \frac{10 \times 10}{100} \right) \% = 19\%$$

43. (4) Single equivalent discount for 20% and 15%

$$= \left(20 + 15 - \frac{20 \times 15}{100} \right) \% = 32\%$$

Single equivalent discount for 32% and 10%

$$= \left(32 + 10 - \frac{32 \times 10}{100} \right) \% = 38.8\%$$

Aliter : Using Rule 4,

Here, $D_1 = 20\%$, $D_2 = 15\%$,
 $D_3 = 10\%$

Single equivalent discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 20}{100} \right) \left(\frac{100 - 15}{100} \right) \left(\frac{100 - 10}{100} \right) \times 100 \right]$$

$$= 100 - \frac{80}{100} \times \frac{85}{100} \times \frac{90}{100} \times 100$$

$$= 100 - 61.20 = 38.80\%$$

44. (2) Single equivalent discount for 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \% = 28\%$$

Single equivalent discount for 28% and 5%

$$= \left(28 + 5 - \frac{28 \times 5}{100} \right) \% = 31.6\%$$

Aliter : Using Rule 4,

Here, $D_1 = 20\%$, $D_2 = 10\%$,
 $D_3 = 5\%$

Single equivalent discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 20}{100} \right) \left(\frac{100 - 10}{100} \right) \left(\frac{100 - 5}{100} \right) \times 100 \right]$$

$$= 100 - \frac{80}{100} \times \frac{90}{100} \times \frac{95}{100} \times 100$$

$$= 100 - 68.40 = 31.60\%$$

45. (3) Single equivalent discount

$$= \left(p + q - \frac{pq}{100} \right) \%$$

46. (1) Single equivalent discount

$$= \left(25 + 10 - \frac{25 \times 10}{100} \right) = 32.5\%$$

\therefore S.P. of chair

$$= \frac{350(100 - 32.5)}{100}$$

$$= \frac{350 \times 67.5}{100} = ₹ 236.25$$

Aliter : Using Rule 3,

Here, M.P. = ₹ 350,
 $D_1 = 25\%$, $D_2 = 10\%$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$= 350 \times \left(\frac{100 - 25}{100} \right) \left(\frac{100 - 10}{100} \right)$$

$$= 350 \times \frac{75}{100} \times \frac{90}{100} = ₹ 236.25$$

47. (4) Single equivalent discount

$$= \left(30 + 15 - \frac{30 \times 15}{100} \right) \% = 40.5\%$$

If the marked price be x , then

$$x \times \frac{100 - 40.5}{100} = 476$$

$$\Rightarrow x = \frac{476 \times 100}{59.5} = ₹ 800$$

Aliter :

Here, S.P. = Rs. 476, $D_1 = 30\%$,
 $D_2 = 15\%$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$476 = \text{M.P.} \left(\frac{100 - 30}{100} \right) \left(\frac{100 - 15}{100} \right)$$

$$\text{M.P.} = \frac{4760000}{70 \times 85}$$

$$\text{M.P.} = ₹ 800$$

48. (1) Using Rule 5,

Single equivalent discount

$$= \left(25 + 5 - \frac{25 \times 5}{100} \right) \%$$

$$= (30 - 1.25)\% = 28.75\%$$

49. (1) Using Rule 5,

C.P. of the table

$$= 800 \times \frac{90}{100} \times \frac{85}{100} = ₹ 612$$

$$\text{Actual C.P.} = 612 + 13 = ₹ 625$$

$$\text{Profit} = 875 - 625 = ₹ 250$$

\therefore Profit per cent

$$= \frac{250}{625} \times 100 = 40\%$$

50. (4) Using Rule 5,

Single equivalent discount

$$= \left(30 + 30 - \frac{30 \times 30}{100} \right) \% = 51\%$$

51. (2) Using Rule 5,

Single equivalent discount

$$= \left(25 + 15 - \frac{25 \times 15}{100} \right)$$

$$= 40 - 3.75 = 36.25$$

DISCOUNT

∴ C.P. for the retailer

$$= \frac{800 \times (100 - 36.25)}{100} = ₹ 510$$

52. (1) First discount

$$= 320 \times \frac{10}{100} = ₹ 32$$

∴ Price after first discount

$$= 320 - 32 = ₹ 288$$

If the second discount be $x\%$, then

$$\therefore \frac{288 \times x}{100} = 288 - 244.80$$

$$= 43.2$$

$$\Rightarrow x = \frac{43.2 \times 100}{288} = 15\%$$

Aliter : Using Rule 3,
Here, M.P. = Rs. 320, S.P. = Rs. 244.80, $D_1 = 10\%$, $D_2 = ?$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$244.80 = 320 \left(\frac{100 - 10}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$\frac{2448000}{320 \times 90} = 100 - D_2$$

$$100 - D_2 = 85$$

$$D_2 = 100 - 85$$

$$D_2 = 15\%$$

53. (1) Using Rule 5,

Single equivalent discount for 40% and 10%

$$= \left(40 + 10 - \frac{40 \times 10}{100} \right) \% = 46\%$$

Difference of percentage = 4%

∴ Savings = 4% of 10000

$$= \frac{10000 \times 4}{100} = ₹ 400$$

54. (2) Using Rule 5,

Single equivalent discount

$$= \left(70 + 30 - \frac{70 \times 30}{100} \right) \%$$

$$= (100 - 21)\% = 79\%$$

After a discount of 70%, remaining price is just 30. On this 30%, another discount of 30% is given which will be equal to 9 so, total discount = 70% + 9% = 79%.

55. (3) Using Rule 5,

C.P. for A

$$= 3000 \times \frac{90}{100} \times \frac{85}{100} = ₹ 2295$$

Actual C.P. = 2295 + 105

$$= ₹ 2400$$

$$\therefore \text{Gain per cent} = \frac{800}{2400} \times 100$$

$$= \frac{100}{3} = 33\frac{1}{3}\%$$

56. (1) Using Rule 5,

Single equivalent discount

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) = 28\%$$

$$\therefore \text{C.P. of table} = \frac{1500 \times 72}{100}$$

$$= ₹ 1080$$

Actual C.P. = 1080 + 20 = ₹ 1100

∴ Required S.P.

$$= 1100 \times \frac{120}{100} = ₹ 1320$$

57. (1) Single equivalent discount

$$= \left(5 + 5 - \frac{25}{100} \right) \%$$

$$= 9\frac{3}{4} = \frac{39}{4} \%$$

$$\therefore \text{S.P.} = 80 \times \frac{361}{400} = ₹ 72.2$$

Aliter : Using Rule 3,

Here, M.P. = ₹ 80, $D_1 = 5\%$,

$D_2 = 5\%$, S.P. = ?

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$\text{S.P.} = 80 \left(\frac{100 - 5}{100} \right) \left(\frac{100 - 5}{100} \right)$$

$$= 80 \times \frac{95}{100} \times \frac{95}{100} = ₹ 72.2$$

58. (2) (a) Single equivalent discount for 20% and 15%

$$= \left(20 + 15 - \frac{20 \times 15}{100} \right) \% = 32\%$$

Single equivalent discount for 32% and 10%

$$= \left(32 + 10 - \frac{32 \times 10}{100} \right) = 38.8\%$$

(b) Single equivalent discount for 25% and 12%

$$= \left(25 + 12 - \frac{25 \times 12}{100} \right) = 34\%$$

Single equivalent discount for 34% and 8%

$$= \left(34 + 8 - \frac{34 \times 8}{100} \right) \%$$

$$= 42 - 2.72 = 39.28\%$$

Aliter : Using Rule 4,

Case I. $D_1 = 20\%$,

$D_2 = 15\%$, $D_3 = 10\%$

Equivalent discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 20}{100} \right) \left(\frac{100 - 15}{100} \right) \left(\frac{100 - 10}{100} \right) \times 100 \right]$$

$$= 100 - \left[\frac{80}{100} \times \frac{85}{100} \times \frac{90}{100} \times 100 \right]$$

$$= 100 - 61.2 = 38.8\%$$

Case II.

$D_1 = 25\%$, $D_2 = 12\%$, $D_3 = 8\%$

Equivalent discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 25}{100} \right) \times \left(\frac{100 - 12}{100} \right) \times \left(\frac{100 - 8}{100} \right) \times 100 \right]$$

$$= 100 - \left[\frac{75}{100} \times \frac{88}{100} \times \frac{92}{100} \times 100 \right]$$

$$= 100 - 60.72 = 39.28\%$$

⇒ Case II is better than Case I.

59. (2) Using Rule 5,

Single equivalent discount

$$= \left(10 + 5 - \frac{10 \times 5}{100} \right) = 14.5\%$$

i.e. ₹ 14.50

60. (3) Using Rule 3,

Required S.P.

$$= 5000 \times \frac{(100 - x)}{100} \times \frac{(100 - y)}{100} \times \frac{(100 - z)}{100}$$

$$= ₹ \left(\frac{(100 - x)(100 - y)(100 - z)}{200} \right)$$

61. (1) C.P. of chair

$$= \left(600 - \frac{600 \times 15}{100} \right) \times \frac{80}{100}$$

DISCOUNT

$$= \frac{510 \times 80}{100} = ₹ 408$$

$$\text{Actual C.P.} = 408 + 28 = ₹ 436$$

Gain percent

$$= \frac{545 - 436}{436} \times 100 = 25\%$$

- 62.** (1) Single equivalent discount for 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) = 28\%$$

Single equivalent discount for 28% and 10%

$$= \left(28 + 10 - \frac{28 \times 10}{100} \right) = 35.2\%$$

∴ S.P. of Piano

$$= \frac{15000 \times (100 - 35.2)}{100}$$

$$= ₹ 9,720$$

Aliter : Using Rule 3,

Here, M.P. = ₹ 15000

S.P. = ?

$$D_1 = 20\%, D_2 = 10\%, D_3 = 10\%$$

S.P. =

$$\text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right)$$

$$= 15000 \left(\frac{100 - 20}{100} \right) \left(\frac{100 - 10}{100} \right) \left(\frac{100 - 10}{100} \right)$$

$$= 15000 \times \frac{80}{100} \times \frac{90}{100} \times \frac{90}{100}$$

$$= 15 \times 72 \times 9 = ₹ 9720$$

- 63.** (3) Using Rule 5,
Single equivalent discount

$$= \left(30 + 20 - \frac{30 \times 20}{100} \right) \%$$

$$= 50 - 6 = 44\%$$

- 64.** (1) Using Rule 5,
Single equivalent discount

$$= \left(10 + 5 - \frac{10 \times 5}{100} \right) \%$$

$$= 14.5 \%$$

∴ Amount to be paid

$$= (100 - 14.5)\% \text{ of } 110$$

$$= \frac{110 \times 85.5}{100} = ₹ 94.05$$

$$\approx ₹ 94$$

- 65.** (3) Single equivalent discount for two successive discounts

$$= \left(x + y - \frac{xy}{100} \right) \%$$

$$= \left(\frac{25}{2} + 10 - \frac{25 \times 10}{200} \right) \%$$

$$= (12.5 + 10 - 1.25) \%$$

$$= 21.25 \%$$

If the marked price of the plate be ₹ x, then

$$= (100 - 21.25) \% \text{ of } x = 6300$$

$$\Rightarrow x \times \frac{78.75}{100} = 6300$$

$$\Rightarrow x = \frac{6300 \times 100}{78.75} = ₹ 8000$$

Aliter : Using Rule 3,

Here, S.P. = ₹ 6300, M.P. = ?

$$D_1 = \frac{25}{2} \% \quad D_2 = 10\%$$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$6300 = \text{M.P.} \left(\frac{100 - \frac{25}{2}}{100} \right) \left(\frac{100 - 10}{100} \right)$$

$$6300 = \text{M.P.} \left(\frac{175}{200} \right) \left(\frac{90}{100} \right)$$

$$\text{M.P.} = \frac{6300 \times 200 \times 100}{175 \times 90}$$

$$\text{M.P.} = ₹ 8000$$

- 66.** (3) Single equivalent discount for 8% and 5%

$$= \left(8 + 5 - \frac{8 \times 5}{100} \right) \%$$

$$= (13 - 0.4) = 12.6 \%$$

Single equivalent discount for 12.6% and 2%

$$= \left(12.6 + 2 - \frac{12.6 \times 2}{100} \right) \%$$

$$= 14.6 - 0.252 = 14.348 \%$$

∴ Net S.P.

$$= (100 - 14.348)\% \text{ of } 7500$$

$$= \frac{7500 \times 85.652}{100} = ₹ 6423.90$$

Aliter : Using Rule 3,

$$\text{M.P.} = ₹ 7500$$

$$\text{S.P.} = ?, D_1 = 8\%, D_2 = 5\%,$$

$$D_3 = 2\%$$

S.P. =

$$\text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right)$$

$$= 7500 \left(\frac{100 - 8}{100} \right) \left(\frac{100 - 5}{100} \right) \left(\frac{100 - 2}{100} \right)$$

$$= 7500 \times \frac{92}{100} \times \frac{95}{100} \times \frac{98}{100}$$

$$= ₹ 6423.90$$

- 67.** (3) Using Rule 5,
Single equivalent discount

$$= \left(x + y - \frac{xy}{100} \right) \%$$

$$= \left(10 + 20 - \frac{10 \times 20}{100} \right) \%$$

$$= 28\%$$

- 68.** (1) Using Rule 5,
Let the marked price of article be Rs. x,
Single equivalent discount for 20% and 10%

$$= \left(x + y - \frac{xy}{100} \right) \%$$

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \% = 28\%$$

According to the question,
30% of x - 28% of x = 144

$$\Rightarrow \frac{x \times 2}{100} = 144$$

$$\Rightarrow x = \frac{144 \times 100}{2}$$

$$= \text{Rs. } 7200$$

- 69.** (1) Using Rule 5,
Single equivalent discount

$$= \left(x + y - \frac{xy}{100} \right) \%$$

$$= \left(10 + 20 - \frac{10 \times 20}{100} \right) \%$$

$$= (30 - 2)\% = 28\%$$

DISCOUNT

- 70.** (4) Marked price of article = Rs. x (let)

According to the question,

$$x \times \frac{80}{100} \times \frac{85}{100} = 3060$$

$$\Rightarrow x = \frac{3060 \times 100 \times 100}{80 \times 85}$$

= Rs. 4500

Aliter : Using Rule 3,

Here, S.P. = Rs. 3060

M.P. = ?, $D_1 = 20\%$, $D_2 = 15\%$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$3060 = \text{M.P.} \left(\frac{100 - 20}{100} \right) \left(\frac{100 - 15}{100} \right)$$

$$3060 = \text{M.P.} \left(\frac{80}{100} \times \frac{85}{100} \right)$$

$$\text{M.P.} = \frac{3060 \times 10000}{80 \times 85}$$

M.P. = Rs. 4500

- 71.** (4) Single equivalent discount for discounts of 10% and 20%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \%$$

$$= (30 - 2) \% = 28 \%$$

Single equivalent discounts for discounts of 28% and 25%

$$= \left(28 + 25 - \frac{28 \times 25}{100} \right) \%$$

$$= (53 - 7) \% = 46 \%$$

Aliter : Using Rule 4,

Here, $D_1 = 10\%$,

$D_2 = 20\%$, $D_3 = 25\%$

Single equivalent discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 10}{100} \right) \left(\frac{100 - 20}{100} \right) \left(\frac{100 - 25}{100} \right) \times 100 \right]$$

$$= 100 - \frac{90}{100} \times \frac{80}{100} \times \frac{75}{100} \times 100$$

$$= 100 - 54 = 46 \%$$

- 72.** (4) Using Rule 5,

Single equivalent discount for 40% and 30%

$$= \left(40 + 30 - \frac{40 \times 30}{100} \right) \%$$

$$= (70 - 12) \% = 58 \%$$

Single equivalent discount for 45% and 20%

$$= \left(45 + 20 - \frac{45 \times 20}{100} \right) \%$$

$$= (65 - 9) \% = 56 \%$$

Let the marked price be Rs. x .

According to the question,

$$x \times (58 - 56) \% = 12$$

$$\Rightarrow \frac{x \times 2}{100} = 12$$

$$\Rightarrow x = \frac{1200}{2} = \text{Rs. } 600$$

- 73.** (3) Using Rule 6,

Single equivalent discount for 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \%$$

$$= 28 \%$$

$$\therefore \text{C.P.} = (100 - 28) \% \text{ of } 1500$$

$$= \frac{1500 \times 72}{100} = \text{Rs. } 1080$$

Actual C.P. = Rs. (1080 + 20)

= Rs. 1100

$$\therefore \text{S.P. on } 20\% \text{ profit}$$

$$= \frac{1100 \times 120}{100} = \text{Rs. } 1320$$

- 74.** (1) Using Rule 3,

Price of article = Rs. x (let)

According to the question,

$$P = \frac{x(100 - 20)}{100} \times \frac{100 - 25}{100}$$

$$\Rightarrow P = x \times \frac{80}{100} \times \frac{75}{100}$$

$$\Rightarrow P = x \times \frac{4}{5} \times \frac{3}{4} = \frac{3x}{5}$$

$$\Rightarrow x = \text{Rs. } \frac{5}{3} P$$

- 75.** (3) Using Rule 3,

Net selling price of scooter.

$$= \text{Rs. } \left(18000 \times \frac{90}{100} \times \frac{95}{100} \times \frac{98}{100} \right)$$

$$= \text{Rs. } 15082.2$$

- 76.** (4) Single equivalent discount for $x\%$ and $y\%$.

$$= \left(x + y - \frac{xy}{100} \right) \%$$

\therefore Single equivalent discount for 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \% = 28 \%$$

Single equivalent discount for 28% and 5%

$$= \left(28 + 5 - \frac{28 \times 5}{100} \right) \%$$

$$= \left(33 - \frac{140}{100} \right) \%$$

$$= (33 - 1.4) \% = 31.6 \%$$

Aliter : Using Rule 4,

Here, $D_1 = 20\%$, $D_2 = 10\%$, $D_3 = 5\%$

Single equivalent discount

$$= 100 - \left[\left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right) \left(\frac{100 - D_3}{100} \right) \times 100 \right]$$

$$= 100 - \left[\left(\frac{100 - 20}{100} \right) \left(\frac{100 - 10}{100} \right) \left(\frac{100 - 5}{100} \right) \times 100 \right]$$

$$= 100 - \frac{80}{100} \times \frac{90}{100} \times \frac{95}{100} \times 100$$

$$= 31.6 \%$$

- 77.** (2) Using Rule 5,

Single equivalent discount

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \% = 28 \%$$

- 78.** (4) Single equivalent discount for 15% and 10%.

$$= \left(15 + 10 - \frac{15 \times 10}{100} \right) \%$$

$$= (25 - 1.5) \% = 23.5 \%$$

\therefore Required S.P.

$$= (100 - 23.5) \% \text{ of } 300$$

$$= \frac{300 \times 76.5}{100} = \text{Rs. } 229.5$$

Aliter : Using Rule 3,

Here, M.P. = Rs. 300, S.P. = ?

$D_1 = 15\%$, $D_2 = 10\%$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$= 300 \left(\frac{100 - 15}{100} \right) \left(\frac{100 - 10}{100} \right)$$

$$= 300 \times \frac{85}{100} \times \frac{90}{100} = 229.50$$

DISCOUNT

- 79.** (3) Single equivalent discount for 15% and 20%

$$= \left(15 + 20 - \frac{15 \times 20}{100} \right) \%$$

$$= (35 - 3) \% = 32 \%$$

Single equivalent discount for 32% and 25%

$$= \left(32 + 25 - \frac{32 \times 25}{100} \right) \%$$

$$= (57 - 8) \% = 49 \%$$

- 80.** (1) Single equivalent discount for 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \%$$

$$= (30 - 2) \% = 28 \%$$

Single equivalent discount for 28% and 5%

$$= \left(28 + 5 - \frac{28 \times 5}{100} \right) \%$$

$$= \left(33 - \frac{140}{100} \right) = 31.6 \%$$

- 81.** (3) Single equivalent discount

$$= \left(x + y - \frac{xy}{100} \right) \%$$

$$= \left(20 + 15 - \frac{20 \times 15}{100} \right) = 32 \%$$

∴ Required S.P.

$$= (100 - 32) \% \text{ of } 250$$

$$= 68 \% \text{ of } 250$$

- 82.** (2) Single equivalent discount for 15% and 20%

$$= \left(20 + 15 - \frac{20 \times 15}{100} \right) \%$$

$$= (35 - 3) \% = 32 \%$$

Single equivalent discount for 32% and 25%

$$= \left(32 + 25 - \frac{32 \times 25}{100} \right) \%$$

$$= (57 - 8) = 49 \%$$

- 83.** (2) Single equivalent discount for 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \% = 28 \%$$

Marked price of article

$$= \text{Rs. } 900$$

S.P. of article

$$= (100 - 28) \% \text{ of } 900$$

$$= \frac{900 \times 72}{100} = \text{Rs. } 648$$

- 84.** (3) Let marked price of article be Rs. x .

∴ S.P. at 25% discount

$$= \text{Rs. } \frac{75x}{100} = \text{Rs. } \frac{3x}{4}$$

S.P. at 15% discount

$$= \text{Rs. } \frac{85x}{100} = \text{Rs. } \frac{17x}{20}$$

$$\text{Increase} = \text{Rs. } \left(\frac{17x}{20} - \frac{3x}{4} \right)$$

$$= \text{Rs. } \left(\frac{17x - 15x}{20} \right) = \text{Rs. } \frac{x}{10}$$

∴ Percentage increase

$$= \frac{\frac{x}{10}}{\frac{3x}{4}} \times 100$$

$$= \frac{x}{10} \times \frac{4}{3x} \times 100$$

$$= \frac{40}{3} = 13\frac{1}{3} \%$$

- 85.** (1) Required selling price

$$= \text{Rs. } \left(700 \times \frac{80}{100} \times \frac{90}{100} \right)$$

$$= \text{Rs. } 504$$

- 86.** (1) Single equivalent discount

$$= \left(x + y - \frac{xy}{100} \right) \%$$

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \%$$

$$= (30 - 2) \% = 28 \%$$

- 87.** (2) Single equivalent discount for 10% and 10%

$$= \left(10 + 10 - \frac{10 \times 10}{100} \right) \% = 19 \%$$

∴ S.P. of chair

$$= (100 - 19) \% \text{ of Rs. } 500$$

$$= \text{Rs. } \left(\frac{500 \times 81}{100} \right) = \text{Rs. } 405$$

- 88.** (4) Single equivalent discount for consecutive discounts of $x\%$ and $y\%$

$$= \left(x + y - \frac{xy}{100} \right) \%$$

Illustration : Let the marked price of an article be Rs. 100.

Two consecutive discounts

= 20% and 10%

Price after a discount of 20%

$$= \text{Rs. } 80$$

Price after a discount of 10%

$$= \frac{80 \times 90}{100} = \text{Rs. } 72$$

$$\text{Discount} = \text{Rs. } (100 - 72)$$

$$= \text{Rs. } 28 \text{ i.e., } 28 \%$$

By formula,

Single equivalent discount

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \%$$

$$= 28 \%$$

- 89.** (1) For the first shopkeeper, Single equivalent discount for two successive discounts of 30% and 6%

$$= \left(30 + 6 - \frac{30 \times 6}{100} \right) \%$$

$$= (36 - 1.8) \% = 34.2 \%$$

∴ S.P. of sewing machine

$$= (100 - 34.2) \% \text{ of Rs. } 700$$

$$= \text{Rs. } \left(\frac{700 \times 65.8}{100} \right) = \text{Rs. } 460.6$$

For the second shopkeeper, Single equivalent discount

$$= \left(20 + 16 - \frac{20 \times 16}{100} \right) \%$$

$$= (36 - 3.2) \% = 32.8 \%$$

∴ S.P. of sewing machine

$$= 700 \times (100 - 32.8) \%$$

$$= \text{Rs. } \left(\frac{700 \times 67.2}{100} \right)$$

$$= \text{Rs. } 470.4$$

Required difference

$$= \text{Rs. } (470.4 - 460.6) = \text{Rs. } 9.8$$

OR

Difference between single equivalent discounts

$$= (34.2 - 32.8) \% = 1.4 \%$$

∴ Difference of S.P.

$$= \text{Rs. } \left(\frac{700 \times 1.4}{100} \right)$$

$$= \text{Rs. } 9.8$$

- 90.** (4) Let the C.P. of sweater be Rs. 100 and its marked price be Rs. x . According to the question,

$$x \times \frac{80}{100} = 128$$

$$\Rightarrow x \times \frac{4}{5} = 128$$

$$\Rightarrow x = \frac{128 \times 5}{4} = \text{Rs. } 160$$

When discount = 14%, then

S.P. of sweater

$$= 160 \times (100 - 14) \%$$

$$= \frac{160 \times 86}{100} = \text{Rs. } 137.6$$

$$\therefore \text{C.P.} = \text{Rs. } 100$$

$$\therefore \text{Profit per cent} = 37.6 \%$$

DISCOUNT

91. (3) The customer pays in cash.
Single equivalent discount for 15% and 4%

$$= \left(15 + 4 - \frac{15 \times 4}{100} \right) \%$$

$$= (19 - 0.6) \% = 18.4 \%$$

$$\therefore \text{Required S.P.}$$

$$= (100 - 18.4) \% \text{ of } 200$$

$$= \text{Rs. } \left(\frac{200 \times 81.6}{100} \right)$$

$$= \text{Rs. } 163.2$$

92. (4) According to the question,
First discount = 15%
S.P. of dinner set after first discount = (100 - 15)% of Rs. 1500

$$= \text{Rs. } \left(\frac{1500 \times 85}{100} \right)$$

$$= \text{Rs. } 1275$$

Second discount
= Rs. (1275 - 1173)
= Rs. 102

If second discount be $x\%$, then

$$\therefore \frac{1275 \times x}{100} = 102$$

$$\Rightarrow x = \frac{102 \times 100}{1275} = 8 \%$$

93. (1) Let the C.P. of article be Rs. 100.

\therefore Its marked price = Rs. 125

$$\text{SP} = \text{Rs. } \left(\frac{125 \times 90}{100} \right)$$

$$= \text{Rs. } 112.5$$

$$\therefore \text{Profit per cent} = 12.5 \%$$

OR

Profit per cent

$$= \left(x + y + \frac{xy}{100} \right) \%$$

where $x = 25\%$; $y = -10\%$

$$= \left(25 - 10 - \frac{25 \times 10}{100} \right) \%$$

$$= 12.5 \%$$

TYPE-II

1. (2) Required loss [As per Rule]

$$= \left(\frac{10 \times 10}{100} \right) \% = 1 \%$$

Aliter : Using Rule 8,

Here, $r = 10\%$ and $r_1 = 10\%$

\Rightarrow Required profit or loss

$$= \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{10 \times (100 - 10)}{100} - 10$$

$$= 9 - 10$$

$$= -1\% \text{ (-ve sign shows loss)}$$

$$= 1\% \text{ loss}$$

2. (2) Suppose C.P. = 100

On 20% above S.P. = 120

On discount of 8%

$$= 120 - 120 \times \frac{8}{100}$$

$$= 120 - \frac{48}{5} = 120 - 9.6 = 110.4$$

$$\text{Gain} = 110.4 - 100 = 10.4 \%$$

Aliter : Using Rule 8,

Here, $r = 20\%$, $r_1 = 8\%$

Profit or loss

$$= \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{20 \times (100 - 8)}{100} - 8$$

$$= \frac{20 \times 92}{100} - 8$$

$$= 18.4 - 8$$

$$= 10.4\% \text{ profit}$$

3. (3) Let the cost price be x
Mark Price

$$= \left(1 + \frac{20}{100} \right) x = 1.2x$$

$$\text{Cash price} = \left(1 - \frac{30}{100} \right) 1.2x$$

$$= 0.7 \times 1.2x = 0.84x$$

$$\text{Net Loss} = x - 0.84x = 0.16x$$

$$\therefore \text{Net loss\%}$$

$$= \frac{0.16x}{x} \times 100 = 16 \%$$

Aliter : Using Rule 8,

Here, $r = 20\%$, $r_1 = 30\%$

Profit or loss

$$= \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{20 \times (100 - 30)}{100} - 30$$

$$= 14 - 30 = -16 \%$$

$$= 16\% \text{ loss}$$

4. (4) Gain % = $20 - 10 - \frac{20 \times 10}{100}$

$$= 20 - 12 = 8 \%$$

Aliter : Using Rule 8,

Here, $r = 20\%$, $r_1 = 10\%$

Profit or loss

$$= \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{20 \times (100 - 10)}{100} - 10$$

$$= 18 - 10 = 8\% \text{ profit.}$$

5. (2) Let C.P. be 100

Marked price = 110

$$\therefore x\% \text{ of } 110 = 11$$

$$\Rightarrow x = \frac{11 \times 100}{110} = 10 \%$$

Aliter : Using Rule 8,

Here, loss % = 1%, $r = 10\%$, r_1

= $x\%$

$$\text{loss \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$-1 = \frac{100 \times (100 - x)}{100} - x$$

(-ve sign for loss)

$$-100 = 1000 - 10x - 100x$$

$$+110x = 1100$$

$$x = 10 \%$$

$$\Rightarrow r_1 = 10 \%$$

6. (4) Let the CP of the article be 100.

According to the question,

The marked price = ₹ 130

Discount = 10%

$$\therefore \text{SP} = 90\% \text{ of } 130$$

$$= \frac{130 \times 90}{100} = ₹ 117$$

$$\therefore \text{Gain} = 117 - 100 = ₹ 17$$

$$\therefore \text{Gain per cent} = 17\% \text{ since the CP} = ₹ 100$$

Aliter : Using Rule 8,

Here, $r = 30\%$, $r_1 = 10\%$

$$\text{gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{30 \times (100 - 10)}{100} - 10$$

$$= \frac{30 \times 90}{100} - 10 = 17 \%$$

7. (2) Let the cost price be ₹ 100.

$$\therefore \text{Marked price} = ₹ 120$$

$$\text{SP} = 87 \frac{1}{2} \% \text{ of } 120$$

$$= \frac{175}{200} \times 120 = ₹ 105$$

$$\therefore \text{Gain per cent} = 5 \%$$

Aliter : Using Rule 8,

$$\text{Here, } r = 20\%, r_1 = 12 \frac{1}{2} \%$$

$$\text{Profit \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

DISCOUNT

$$\begin{aligned}
 &= \frac{20 \times \left(100 - \frac{25}{2}\right)}{100} - \frac{25}{2} \\
 &= \frac{20 \times 175}{200} - 12.5 \\
 &= 17.5 - 12.5 = 5\% \\
 \text{8. (1) Let the C.P. be ₹ 100} \\
 \therefore \text{Marked price} &= ₹ 130 \\
 \text{S.P.} &= 85\% \text{ of ₹ 130} \\
 &= ₹ \left(\frac{85 \times 130}{100}\right) = ₹ 110.5 \\
 \therefore \text{Gain percent} &= 10.5\% \\
 \text{Aliter : Using Rule 8,} \\
 \text{Here, } r &= 30\%, r_1 = 15\% \\
 \text{Profit \%} &= \frac{r \times (100 - r_1)}{100} - r_1 \\
 &= \frac{30 \times (100 - 15)}{100} - 15 \\
 &= \frac{30 \times 85}{100} - 15 \\
 &= 25.5 - 15 = 10.5\% \\
 \text{9. (1) Let the cost price of article} \\
 &= ₹ 100 \\
 \therefore \text{Marked price} &= ₹ 125 \\
 \text{SP of the article} \\
 &= \left(100 - \frac{25}{2}\right)\% \text{ of } 125 \\
 &= \frac{175}{2}\% \text{ of } 125 \\
 &= \frac{125 \times 175}{2 \times 100} = \frac{875}{8} \\
 &= ₹ 109 \frac{3}{8} \\
 \therefore \text{Gain percent} \\
 &= \left(109 \frac{3}{8} - 100\right) = 9 \frac{3}{8}\% \\
 \text{Aliter : Using Rule 8,} \\
 \text{Here, } r &= 25\%, \\
 r_1 &= 12 \frac{1}{2}\% = 12.5\% \\
 \text{Profit \%} &= \frac{r \times (100 - r_1)}{100} - r_1 \\
 &= \frac{25 \times (100 - 12.5)}{100} - 12.5 \\
 &= \frac{25 \times 87.5}{100} - 12.5 \\
 &= 21.875 - 12.5 = 9.375 \\
 &= 9 \frac{3}{8}\%
 \end{aligned}$$

10. (4) Let the marked price be x .

$$\begin{aligned}
 \therefore \frac{x \times 75}{100} &= 200 \times \frac{135}{100} \\
 \Rightarrow x &= \frac{200 \times 135}{75} = ₹ 360 \\
 \text{Aliter : Using Rule 9,} \\
 \text{Here, } r &= 25\%, R = 35\%, \\
 \text{C.P.} &= ₹ 200 \\
 \text{Marked price} \\
 &= \text{Rs. } 200 + 200 \times \left(\frac{r + R}{100 - r} \times 100\right)\% \\
 &= 200 + 200 \times \left(\frac{25 + 35}{100 - 25}\right) \times 100\% \\
 &= 200 + \frac{200 \times 60}{75} \times 100\% \\
 &= 200 + \frac{200 \times 20 \times 4}{100} \\
 &= 200 + 160 = ₹ 360
 \end{aligned}$$

11. (3) Let the cost price be ₹ 100.
Marked price = ₹ 140

$$\text{S.P.} = \frac{75 \times 140}{100} = ₹ 105$$

\therefore Profit per cent = 5%

Aliter : Using Rule 8,
Here, $r = 40\%$, $r_1 = 25\%$

$$\begin{aligned}
 \text{Profit \%} &= \frac{r \times (100 - r_1)}{100} - r_1 \\
 &= \frac{40 \times (100 - 25)}{100} - 25 \\
 &= \frac{40 \times 75}{100} - 25 \\
 &= \frac{3000}{100} - 25 \\
 &= 30 - 25 = 5\%
 \end{aligned}$$

12. (4) Let cost price of article = ₹ 100

\therefore Marked price of article

$$= \frac{100 \times 120}{100} = ₹ 120$$

S.P. of article = ₹ 110

\therefore Discount = $120 - 110 = ₹ 10$

\therefore If discount = $x\%$, then

$$\frac{120 \times x}{100} = 10$$

$$\Rightarrow x = \frac{10 \times 100}{120} = \frac{25}{3} = 8 \frac{1}{3}\%$$

Aliter : Using Rule 8,

Here, $r = 20\%$, Profit = 10%

Let, discount $r_1 = x\%$

$$\text{Profit \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$\begin{aligned}
 10 &= \frac{20 \times (100 - x)}{100} - r_1 \\
 1000 &= 2000 - 20x - 100x \\
 -1000 &= -120x
 \end{aligned}$$

$$x = \frac{100}{12}$$

$$= \frac{25}{3} = 8 \frac{1}{3}\%$$

13. (2) Let the CP of each shirt be ₹ 100, then SP = ₹ 140.

$$\therefore \text{New SP} = \frac{140 \times 90}{100} = ₹ 126$$

\therefore When S.P. is ₹ 126,
CP = ₹ 100

$$\therefore \text{When S.P. is ₹ } \frac{13608}{72},$$

then C.P.

$$= \frac{100}{126} \times \frac{13608}{72} = ₹ 150$$

14. (2) C.P. of article = ₹ 100
Marked price = ₹ 150

$$\text{S.P.} = \frac{150 \times 60}{100} = ₹ 90$$

Loss = $100 - 90 = ₹ 10$ i.e. 10%

Aliter : Using Rule 8,
Here, $r = 50\%$, $r_1 = 40\%$

$$\text{His loss \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{50 \times (100 - 40)}{100} - 40$$

$$= \frac{50 \times 60}{100} - 40$$

$$= -10\%$$

(-ve sign shows loss)

= 10% loss

15. (4) Let the CP of article be ₹ 100.

\therefore Marked price = ₹ 140

$$\text{S.P.} = \frac{140 \times 80}{100} = ₹ 112$$

\therefore Gain per cent = 12%

Aliter : Using Rule 8,

Here, $r = 40\%$, $r_1 = 20\%$

Required profit or loss %

$$= \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{40 \times (100 - 20)}{100} - 20$$

$$= \frac{40 \times 80}{100} - 20$$

$$= 32 - 20 = 12\% \text{ profit}$$

DISCOUNT

- 16.** (4) Let the C.P. of article be ₹ 100
 \Rightarrow Marked price = ₹ 145

$$\Rightarrow \text{S.P.} = \frac{145 \times 80}{100} = ₹ 116$$

$$\Rightarrow \text{Profit percent} = 16\%$$

Aliter : Using Rule 8,

$$\text{Here, } r = 45\%, r_1 = 20\%$$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{45 \times (100 - 20)}{100} - 20$$

$$= \frac{3600}{100} - 20$$

$$= 36 - 20 = 16\%$$

- 17.** (2) Let the cost price be ₹ 100.
 \therefore Marked price = ₹ 150

$$\text{S.P.} = \frac{150 \times 80}{100} = ₹ 120$$

$$\text{when S.P.} = 120, \text{C.P.} = 100$$

$$\text{when S.P.} = 840$$

$$\text{C.P.} = \frac{100}{120} \times 840 = ₹ 700$$

Aliter : Using Rule 8,

$$\text{Here, } r = 50\%, r_1 = 20\%,$$

$$\text{S.P.} = ₹ 840$$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{50 \times (100 - 20)}{100} - 20$$

$$= \frac{50 \times 80}{100} - 20$$

$$= 20\%$$

We know that

$$\text{Gain \%} = \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100$$

$$20 = \left(\frac{840 - x}{x} \right) \times 100$$

$$20x = 84000 - 100x$$

$$120x = 84000$$

$$\boxed{x = 700}$$

$$\therefore \text{C.P.} = ₹ 700$$

- 18.** (3) Let the C.P. of each article be ₹ 100.

$$\therefore \text{Marked price} = ₹ 140$$

$$\therefore \text{S.P.} = \frac{140 \times 85}{100} = ₹ 119$$

$$\therefore \text{Gain per cent} = 19\%$$

Aliter : Using Rule 8,

$$\text{Here, } r = 40\%, r_1 = 15\%$$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{40 \times (100 - 15)}{100} - 15$$

$$= \frac{40 \times 85}{100} - 15$$

$$= \frac{3400}{100} - 15$$

$$= 19\%$$

- 19.** (3) Let C.P. be ₹ 100.

$$\text{Marked price} = ₹ 120$$

$$\text{S.P.} = \frac{120 \times 95}{100} = ₹ 114$$

$$\text{Gain per cent} = 14\%$$

Aliter : Using Rule 8,

$$\text{Here, } r = 20\%, r_1 = 5\%$$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{20 \times (100 - 5)}{100} - 5$$

$$= 19 - 5 = 14\%$$

- 20.** (1) Let Cost price = ₹ 100

$$\text{Marked price} = ₹ 120$$

$$\text{Selling price} = \frac{120 \times 80}{100} = ₹ 96$$

$$\therefore \text{Loss} = ₹ 4 \text{ and loss per cent} = 4\%$$

Aliter : Using Rule 8,

$$\text{Here, } r = 20\%, r_1 = 20\%$$

$$\text{Loss \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{20 \times (100 - 20)}{100} - 20$$

$$= \frac{20 \times 80}{100} - 20$$

$$= -4\% \text{ (-ve sign shows loss)}$$

$$= 4\% \text{ loss}$$

- 21.** (3) Let Cost price of article = ₹ 100

$$\text{Marked price} = ₹ 125$$

$$\therefore \text{S.P.} = \frac{125 \times 90}{100} = ₹ 112.5$$

$$\therefore \text{Gain} = 112.5 - 100 = 12.5$$

$$\Rightarrow \text{Gain percent} = 12.5\%$$

Aliter : Using Rule 8,

$$\text{Here, } r = 25\%, r_1 = 10\%$$

$$\text{Profit \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{25 \times (100 - 10)}{100} - 10$$

$$= \frac{25 \times 90}{100} - 10$$

$$= 22.5 - 10 = 12.5\%$$

- 22.** (4) Let the cost price be ₹ 100 and marked price be x.

$$\therefore \frac{x \times 90}{100} = 108$$

$$\Rightarrow \frac{9x}{10} = 108$$

$$\Rightarrow x = \frac{108 \times 10}{9} = 120$$

$$\text{Required Percent} = 20\%$$

Aliter : Using Rule 8,

$$\text{Here, Gain \%} = 8\%, r_1 = 10\%, r = ?$$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$8 = \frac{r \times (100 - 10)}{100} - 10$$

$$8 = \frac{r \times 90}{100} - 10$$

$$18 = \frac{r \times 9}{10} = 20\%$$

- 23.** (1) Let the C.P. be ₹ 100 and the marked price be ₹ x.

$$\therefore x \times \frac{88}{100} = 132$$

$$\Rightarrow x = \frac{132 \times 100}{88}$$

$$= 150 \text{ i.e., more by } 50\%$$

$$\therefore \text{Required percentage} = 50\%$$

Aliter : Using Rule 8,

$$\text{Here, Gain \%} = 32\%,$$

$$r_1 = 12\%, r = ?$$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$32 = \frac{r \times (100 - 12)}{100} - 12$$

$$44 = \frac{r \times 88}{100}$$

$$r = 50\%$$

DISCOUNT

- 24.** (4) C.P. of article = ₹ 100
Let marked price of article x .

$$\therefore x \times \frac{90}{100} = 117$$

$$\Rightarrow x = \frac{117 \times 100}{90}$$

= ₹ 130 or 30% above the cost price.

Aliter : Using Rule 8,

Here, $r_1 = 10\%$, gain % = 17%,
 $r = ?$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$17 = \frac{r \times (100 - 10)}{100} - 10$$

$$27 = \frac{r \times 90}{100}$$

$$r = 30\%$$

- 25.** (3) Let marked price of the wrist watch be x

$$\therefore \frac{90x}{100} = \frac{450 \times 120}{100}$$

$$\Rightarrow 90x = 450 \times 120$$

$$\therefore x = \frac{450 \times 120}{90} = ₹ 600$$

Aliter : Using Rule 8,

Here, $r_1 = 10\%$, profit = 20%,
 $r = ?$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$20 = \frac{r \times (100 - 10)}{100} - 10$$

$$20 = \frac{9r}{10} - 10$$

$$30 = \frac{9r}{10}$$

$$r = \frac{300}{9}\%$$

$$\therefore \text{List price} = 450 + 450 \times \frac{300}{9}\%$$

$$= 450 + 450 \times \frac{300}{900}$$

$$= 450 + 150 = ₹ 600$$

- 26.** (3) For Anand,

Cost price = ₹ x

Marked price = ₹ $\frac{3}{2}x$

Selling price = $\frac{3x}{2} \times \frac{80}{100}$

$$= ₹ \frac{6x}{5}$$

For Balaji,

Cost price = ₹ $\frac{6x}{5}$

Selling price = ₹ $\left(\frac{6x}{5} + 20\right)$

$$\therefore \frac{6x}{5} + 20 = \frac{x \times 130}{100}$$

$$\Rightarrow \frac{13x}{10} - \frac{6x}{5} = 20$$

$$\Rightarrow \frac{13x - 12x}{10} = 20$$

$$\Rightarrow \frac{x}{10} = 20$$

$$\Rightarrow x = ₹ 200$$

\therefore Required gain percent

$$= \frac{20}{\frac{6x}{5}} \times 100$$

$$= \frac{20 \times 5 \times 100}{6 \times 200} = \frac{25}{3} = 8.33\%$$

- 27.** (4) Cost price of the shirt = ₹ x

$$\therefore x \times \frac{120}{100} = \frac{850 \times 96}{100}$$

$$\Rightarrow x \times 120 = 850 \times 96$$

$$\Rightarrow x = \frac{850 \times 96}{120} = ₹ 680$$

Aliter : Using Rule 6,

Here $r = 20\%$, $D = 4\%$,

M.P. = ₹ 850, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{850}{\text{C.P.}} = \frac{100 + 20}{100 - 4}$$

$$\text{C.P.} = \frac{850 \times 96}{120}$$

$$\text{C.P.} = ₹ 680$$

- 28.** (2) Cost price of the article = ₹ x

$$\therefore x \times \frac{125}{100} = \frac{500 \times 95}{100}$$

$$\Rightarrow x = \frac{500 \times 95}{125} = ₹ 380$$

Aliter : Using Rule 6,

Here, $R = 25\%$, $D = 5\%$,

M.P. = ₹ 500, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{500}{\text{C.P.}} = \frac{100 + 25}{100 - 5}$$

$$\text{C.P.} = \frac{500 \times 95}{125} = ₹ 380$$

- 29.** (2) Marked price = ₹ x

Discount = ₹ $\frac{x}{5}$

$$\text{S.P.} = x - \frac{x}{5} = ₹ \frac{4x}{5}$$

$$\text{Loss} = ₹ \frac{x}{10}$$

$$\therefore \text{C.P.} = \frac{4x}{5} + \frac{x}{10}$$

$$= \frac{8x + x}{10} = ₹ \frac{9x}{10}$$

$$\therefore \text{Loss per cent} = \frac{\frac{x}{10}}{\frac{9x}{10}} \times 100$$

$$= \frac{100}{9} = 11\frac{1}{9}\%$$

- 30.** (2) Marked price of article

= ₹ x (let)

\therefore S.P. of article

$$= ₹ \left(x \times \frac{90}{100} \times \frac{108}{100} \right)$$

$$\therefore x \times \frac{90}{100} \times \frac{108}{100} = 3402$$

$$\Rightarrow x = \frac{3402 \times 100 \times 100}{90 \times 108}$$

$$= ₹ 3500$$

DISCOUNT

- 31.** (1) Let the marked price of table be ₹ x .

$$\begin{aligned}\therefore \frac{x \times 80}{100} &= \frac{3200 \times 125}{100} \\ \Rightarrow x \times 80 &= 3200 \times 125 \\ \Rightarrow x &= \frac{3200 \times 125}{80} = ₹ 5000\end{aligned}$$

Aliter : Using Rule 6,
Here, $r = 25\%$, $D = 20\%$,
C.P. = ₹ 3200, M.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{\text{M.P.}}{3200} = \frac{100 + 25}{100 - 20}$$

$$\text{M.P.} = \frac{125 \times 3200}{80} = ₹ 5000$$

- 32.** (4) Marked price of article = ₹ x

$$\begin{aligned}\therefore \frac{x \times (100 - 12.5)}{100} &= \frac{210 \times 120}{100} \\ \Rightarrow x \times 87.5 &= 210 \times 120 \\ \Rightarrow x &= \frac{210 \times 120}{87.5} = ₹ 288\end{aligned}$$

Aliter : Using Rule 6,
Here, $R = 20\%$, $D = 12.5\%$,
C.P. = ₹ 210, M.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{\text{M.P.}}{210} = \frac{100 + 20}{100 - 12.5}$$

$$\text{M.P.} = \frac{120}{87.5} \times 210 = ₹ 288$$

- 33.** (3) C.P. of article = ₹ 100
and marked price of article = ₹ x (let)

$$\therefore x \times \frac{90}{100} = 117$$

$$\Rightarrow x = \frac{117 \times 100}{90} = ₹ 130$$

i.e. 30% above the cost price.

Aliter : Using Rule 6,
Let, C.P. = ₹ 100, $r = 17\%$,
 $D = 10\%$, M.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{\text{M.P.}}{100} = \frac{100 + 17}{100 - 10}$$

$$\text{M.P.} = \frac{117}{90} \times 100$$

$$\text{M.P.} = ₹ 130$$

\Rightarrow 30% above cost price.

- 34.** (4) Production cost of radio = ₹ x

$$\therefore \frac{x \times 130}{100} = 286$$

$$\Rightarrow x = \frac{286 \times 100}{130} = ₹ 220$$

\therefore Selling price = 90% of 286

$$= \frac{286 \times 90}{100} = ₹ 257.40$$

$$\begin{aligned}\text{Profit} &= ₹ (257.40 - 220) \\ &= ₹ 37.40\end{aligned}$$

- 35.** (1) C.P. of cycle = Rs. x

$$\therefore 840 \times \frac{90}{100} = \frac{x \times 126}{100}$$

$$\Rightarrow x \times 126 = 840 \times 90$$

$$\Rightarrow x = \frac{840 \times 90}{126} = ₹ 600$$

Aliter : Using Rule 6,
Here, $r = 26\%$, $D = 10\%$,

$$\text{M.P.} = ₹ 840$$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{840}{\text{M.P.}} = \frac{100 + 26}{100 - 10}$$

$$\text{C.P.} = \frac{840 \times 90}{126} = \text{Rs. } 600$$

- 36.** (4) C.P. of article = ₹ 100

Marked price = ₹ 110

$$\text{S.P.} = \frac{110 \times 90}{100} = ₹ 99$$

$$\text{Loss} = 100 - 99 = ₹ 1 = 1\%$$

Aliter : Using Rule 8,
Here, $r = 10\%$, $r_1 = 10\%$

\Rightarrow Gain or Loss %

$$= \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{10 \times (100 - 10)}{100} - 10$$

$$= 9 - 10$$

$$= -1 \text{ (-ve sign shows loss)}$$

$$\Rightarrow \text{Loss} = 1\%$$

- 37.** (3) Marked price of article

$$= \text{Rs. } x$$

$$\therefore \text{S.P. of article} = \frac{90x}{100}$$

$$= \text{Rs. } \frac{9x}{10}$$

$$\therefore \text{C.P.} = \frac{80 \times 9x}{100 \times 10} = \frac{36x}{50}$$

$$\therefore \text{Gain} = \frac{9x}{10} - \frac{36x}{50}$$

$$= \frac{45x - 36x}{50} = \text{Rs. } \frac{9x}{50}$$

$$\therefore \text{Gain\%} = \frac{\frac{9x}{50}}{\frac{36x}{50}} \times 100 = 25\%$$

- 38.** (4) Marked price of instrument

$$= \text{Rs. } x \text{ (let)}$$

$$\therefore \text{Its S.P.} = \text{Rs. } \frac{80x}{100}$$

$$= \text{Rs. } \frac{4x}{5}$$

$$\therefore \text{C.P.} = \text{Rs. } \left(\frac{4x}{5} - 150 \right)$$

$$\therefore \frac{4x}{5} = \left(\frac{4x}{5} - 150 \right) \times \frac{125}{100}$$

$$\Rightarrow \frac{4x}{5} = \left(\frac{4x}{5} - 150 \right) \times \frac{5}{4}$$

$$\Rightarrow \frac{4x}{5} \times \frac{4}{5} = \frac{4x}{5} - 150$$

$$\Rightarrow \frac{4x}{5} - \frac{16x}{25} = 150$$

$$\Rightarrow \frac{20x - 16x}{25} = 150$$

$$\Rightarrow \frac{4x}{25} = 150 \Rightarrow 4x = 150 \times 25$$

$$\Rightarrow x = \frac{150 \times 25}{4} = \text{Rs. } 937.5$$

DISCOUNT

- 39.** (2) Marked price of TV

= Rs. x (let)

According to question,

$$\frac{x \times 80}{100} - \frac{x \times 70}{100} = 800$$

$$\Rightarrow \frac{10x}{100} = 800$$

$$\Rightarrow x = \frac{800 \times 100}{10} = \text{Rs. } 8000$$

- 40.** (4) Profit per cent

$$= \left(x + y + \frac{xy}{100} \right) \%$$

$$= \left(25 - 10 - \frac{25 \times 10}{100} \right) \%$$

$$= (15 - 2.5)\% = 12.5 \%$$

Aliter : Using Rule 8,

Here $r = 25\%$, $r_1 = 10\%$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{25 \times (100 - 10)}{100} - 10$$

$$= \frac{25 \times 90}{100} - 10$$

$$= 22.5 - 10 = 12.5\%$$

- 41.** (1) Let the C.P. of article be Rs. 100,

According to the questions

Marked price of article = Rs. 120

After a discount of 8%,

$$\text{S. P.} = \left(\frac{120 \times 92}{100} \right)$$

$$= \text{Rs. } 110.4 \text{ Gain}$$

$$= \text{Rs. } (110.4 - 100) = \text{Rs. } 10.4$$

$$\therefore \text{Gain \%} = 10.4\%$$

Aliter : Using Rule 8,

Here, $r = 20\%$

$$r_1 = 8\%$$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{20 \times (100 - 8)}{100} - 8$$

$$= \frac{20 \times 92}{100} - 8$$

$$= 18.4 - 8 = 10.4\%$$

- 42.** (1) C.P. of article = Rs. 100 (let).

M.P. of article = Rs. x (let)

According to the question,

$$\frac{x \times 90}{100} = 117$$

$$\Rightarrow x = \frac{117 \times 100}{90} = \text{Rs. } 130$$

= marked price

\therefore On allowing no discount profit = 30%

- 43.** (4) Let the marked price of the camera be Rs. x .

According to the question,

$$\frac{x \times 90}{100} = \frac{600 \times 120}{100}$$

$$\Rightarrow x \times 90 = 600 \times 120$$

$$\Rightarrow x = \frac{600 \times 120}{90} = \text{Rs. } 800$$

Aliter : Using Rule 6

Here, $r = 20\%$

$$D = 10\%$$

$$\text{C.P.} = \text{Rs. } 600$$

$$\text{M.P.} = ?$$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{\text{M.P.}}{600} = \frac{100 + 20}{100 - 10}$$

$$\text{M.P.} = \frac{120 \times 600}{90} = 800$$

- 44.** (3) Let the C.P. of article be Rs. 100 and the marked price be Rs. x .

Case I

$$\frac{x \times 90}{100} = 120$$

$$\Rightarrow x = \frac{120 \times 100}{90}$$

$$= \text{Rs. } \frac{400}{3}$$

Case II

$$\text{S.P.} = \frac{x \times 80}{100} = \text{Rs. } \frac{4x}{5}$$

$$= \text{Rs. } \left(\frac{4}{5} \times \frac{400}{3} \right) = \text{Rs. } \frac{320}{3}$$

$$\therefore \text{Profit} = \text{Rs. } \left(\frac{320}{3} - 100 \right)$$

$$= \text{Rs. } \left(\frac{320 - 300}{3} \right)$$

$$= \text{Rs. } \frac{20}{3}$$

$$\therefore \text{Profit percent} = \frac{20}{3} \%$$

$$= 6\frac{2}{3} \%$$

- 45.** (2) Let the marked price of article be Rs. x and its C.P. be Rs. 100. According to the question,

$$x \times \frac{80}{100} = \frac{100 \times 120}{100}$$

$$\Rightarrow x = \frac{120 \times 100}{80} = \text{Rs. } 150$$

S.P. after a discount of 30%

$$= \frac{150 \times 70}{100}$$

$$= \text{Rs. } 105 \text{ i.e. gain} = 5\%$$

- 46.** (1) C.P. of article

$$= \text{Rs. } \left(\frac{100}{130} \times 286 \right) = \text{Rs. } 220$$

S.P. of article

$$= \frac{286 \times 90}{100} = \text{Rs. } 257.40$$

\therefore Profit

$$= \text{Rs. } (257.40 - 220)$$

$$= \text{Rs. } 37.40$$

\therefore Profit percent

$$= \frac{37.40 \times 100}{220} = 17\%$$

- 47.** (3) Marked price of toy = Rs. x
A discount of 20% is given.

$$\therefore \frac{80x}{100} = 300$$

$$\Rightarrow x = \frac{300 \times 100}{80}$$

$$= \text{Rs. } 375$$

\therefore Profit percent

$$= \left(\frac{405 - 375}{375} \right) \times 100 = 8\%$$

DISCOUNT

- 48.** (4) C.P. of article = Rs. 100

Its marked price = Rs. 120

$$\therefore \text{S.P.} = \frac{120 \times 95}{100}$$

$$= \text{Rs. } 114$$

$$\therefore \text{Profit percent} = 14\%$$

- 49.** (4) Let the marked price of radio be Rs. x .

According to the question,

$$85\% \text{ of } x = 255$$

$$\Rightarrow \frac{x \times 85}{100} = 255$$

$$\Rightarrow x = \frac{255 \times 100}{85} = \text{Rs. } 300$$

- 50.** (1) Let the C.P. of article be Rs. 100.

\therefore Its marked price = Rs. 130

Its S.P. = 90% of 130

$$= \frac{130 \times 90}{100} = \text{Rs. } 117$$

$$\therefore \text{Profit per cent} = 17\%$$

- 51.** (3) Let the production cost of article be Rs. x .

Effective percentage

$$= \left(x + y + \frac{xy}{100} \right) \%$$

$$= \left(40 - 20 - \frac{40 \times 20}{100} \right) \%$$

$$= (20 - 8)\% = 12\%$$

According to the question,

$$12\% \text{ of } x = 48$$

$$\Rightarrow \frac{12x}{100} = 48$$

$$\Rightarrow x = \frac{48 \times 100}{12} = \text{Rs. } 400$$

- 52.** (3) Let the marked price of watch be Rs. x .

Actual C.P. of watch

= 110% of 500

$$= \text{Rs. } \left(\frac{500 \times 110}{100} \right) = \text{Rs. } 550$$

According to the question,

$$x \times \frac{75}{100} = \frac{550 \times 120}{100}$$

$$\Rightarrow x = \frac{550 \times 120}{75} = \text{Rs. } 880$$

- 53.** (2) C.P. of laptop = Rs. x

According to the question,

$$x \times \frac{96}{100} = \frac{12000 \times 85}{100}$$

$$= 120 \times 85$$

$$\Rightarrow x = \frac{120 \times 85 \times 100}{96}$$

$$= \text{Rs. } 10625$$

- 54.** (2) Let the C.P. of article be Rs. 100.

According to the question,

Marked price of article

= Rs. 120

$$\text{S.P. of article} = \text{Rs. } \left(\frac{120 \times 80}{100} \right)$$

$$= \text{Rs. } 96$$

$$\therefore \text{Loss} = \text{Rs. } 4 \text{ i.e. } 4\%$$

- 55.** (2) C.P. of article = Rs. 100

\therefore Marked price = Rs. 120

$$\text{S.P.} = \frac{120 \times 80}{100} = \text{Rs. } 96$$

$$\therefore \text{Loss} = \text{Rs. } 4 \text{ i.e. } 4\%$$

- 56.** (2) Marked price of gift box = Rs. x

According to the question,

$$\frac{90x}{100} = \frac{150 \times 110}{100}$$

$$\Rightarrow 90x = 150 \times 110$$

$$\Rightarrow x = \frac{150 \times 110}{90} = \text{Rs. } 183.3$$

- 57.** (2) Let the marked price of article be Rs. x .

According to the question,

$$95\% \text{ of } x = 950$$

$$\Rightarrow x \times \frac{95}{100} = 950$$

$$\Rightarrow x = \frac{950 \times 100}{95} = \text{Rs. } 1000$$

- 58.** (1) Let the marked price of article be Rs. x and its cost price be Rs. 100.

According to the question.

$$(100 - 20)\% \text{ of } x = 125$$

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

$$\Rightarrow x = \text{Rs. } \left(\frac{125 \times 100}{80} \right)$$

$$= \text{Rs. } 156.25$$

- 59.** (1) C.P. of article = Rs. 100 (let)

\therefore Its marked price = Rs. 140

Discount = 25%

\therefore S.P. of article

$$= \text{Rs. } \left(\frac{140 \times 75}{100} \right)$$

$$= \text{Rs. } 105$$

$$\therefore \text{Profit per cent} = 5\%$$

- 60.** (3) C.P. of article = Rs. 100 (let)

\therefore Marked price = Rs. 120

Its S.P. = Rs. 108

\therefore Discount = Rs. (120 - 108)

= Rs. 12

\therefore If discount be $x\%$, then,

$$120 \times \frac{x}{100} = 12$$

$$\Rightarrow x = \frac{12 \times 100}{120} = 10\%$$

- 61.** (2) Let the marked price of watch be Rs. x .

According to the question,

$$(20 - 10)\% \text{ of } x = 125$$

$$\Rightarrow x \times \frac{10}{100} = 125$$

$$\Rightarrow x = \text{Rs. } 1250$$

- 62.** (3) Single equivalent discount for 15% and 20%

$$= \left(20 + 15 - \frac{20 \times 15}{100} \right) \%$$

$$= (35 - 3)\% = 32\%$$

\therefore Net rate of cloth

$$= (100 - 32)\% \text{ of Rs. } 50$$

$$= \text{Rs. } \left(\frac{50 \times 68}{100} \right) \text{ per metre}$$

$$= \text{Rs. } 34 \text{ per metre}$$

- 63.** (2) Let the C.P. of article be Rs. 100.

\therefore Its marked price = Rs. 120

Let the rate of discount be $x\%$

According to the question,

$$x\% \text{ of } 120 = 120 - 108$$

$$\Rightarrow \frac{120 \times x}{100} = 12$$

$$\Rightarrow x = \frac{12 \times 100}{120} = 10\%$$

- 64.** (1) Let the marked price of article be Rs. x .

According to the question,

$$90\% \text{ of } x = 720 \times 115\%$$

$$\Rightarrow x \times \frac{90}{100} = 720 \times \frac{115}{100}$$

$$\Rightarrow x = \frac{115 \times 720}{90} = \text{Rs. } 920$$

DISCOUNT

- 65.** (3) Let the marked price of article be Rs. x .

According to the question,

$$(9 - 7)\% \text{ of } x = 15$$

$$\Rightarrow x \times \frac{2}{100} = 15$$

$$\Rightarrow x = \frac{15 \times 100}{2} = \text{Rs. } 750$$

- 66.** (2) Let the marked price of book be Rs. 100.

C.P. for the retailer

$$= \text{Rs. } (100 - 30) = \text{Rs. } 70$$

S.P. for the retailer = Rs. 90

\therefore Profit per cent

$$= \left(\frac{90 - 70}{70} \right) \times 100$$

$$= \frac{200}{7} = 28\frac{4}{7}\%$$

- 67.** (1) Let the C.P. of article be Rs. x .

$$\therefore \text{Marked price} = \text{Rs. } \frac{112x}{100}$$

According to the question,

$$\frac{112x}{100} \times \frac{95}{100} = 532$$

$$\Rightarrow x = \frac{532 \times 10000}{112 \times 95} = \text{Rs. } 500$$

- 68.** (4) Percentage effect

$$= \left(40 - 25 - \frac{40 \times 25}{100} \right)\%$$

$$= (15 - 10)\% = 5\%$$

If the C.P. of article be Rs. x ,

$$\text{then, } x \times \frac{105}{100} = 2100$$

$$\Rightarrow x = \frac{2100 \times 100}{105} = \text{Rs. } 2000$$

- 69.** (3) Let the marked price of the article be Rs. 100.

\therefore C.P. for the retailer

$$= \text{Rs. } \left(\frac{100 \times 60}{100} \right) = \text{Rs. } 60$$

Its S.P. = Rs. 100

\therefore Profit = Rs. $(100 - 60)$

= Rs. 40

$$\therefore \text{Profit per cent} = \frac{40}{60} \times 100$$

$$= \frac{200}{3} = 66\frac{2}{3}\%$$

- 70.** (2) Single equivalent discount for 20% and 10%

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right)\%$$

$$= (30 - 2)\% = 28\%$$

\therefore S.P. of article

$$= (100 - 28)\% \text{ of Rs. } 900$$

$$= \text{Rs. } \left(\frac{900 \times 72}{100} \right) = \text{Rs. } 648$$

- 71.** (3) Let C.P. of article be Rs. 100.

\therefore Marked price = Rs. 150

S.P. of article

$$= \text{Rs. } \left(\frac{150 \times 75}{100} \right)$$

$$= \text{Rs. } 112.5$$

\therefore Profit = Rs. $(112.5 - 100)$

$$= \text{Rs. } 12.5$$

\therefore C.P. = Rs. 100

\therefore Profit per cent = 12.5%

TYPE-III

- 1.** (4) S.P. of that article

$$= 800 \times \frac{90}{100} = \text{₹ } 720$$

He still makes 20% profit

\therefore C.P. of the article

$$= 720 \times \frac{100}{120} = \text{₹ } 600$$

Aliter : Using Rule 6,

Here, $r = 20\%$, $D = 10\%$,

M.P. = ₹ 800, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{800}{\text{C.P.}} = \frac{100 + 20}{100 - 10}$$

$$\text{C.P.} = \frac{800 \times 90}{120}$$

$$\text{C.P.} = \text{₹ } 600$$

- 2.** (4) Discount

$$= 12\frac{1}{2}\% = \frac{25}{2}\%$$

After discount S.P.

$$= \text{₹ } 200 \times 87.5 = \text{₹ } 175$$

Gain % = 25%

$$\text{Required C.P.} = \text{₹ } \frac{100}{125} \times 175$$

$$= \text{₹ } 140$$

Aliter : Using Rule 6,

Here, $r = 25\%$, $D = 12.5\%$,

M.P. = ₹ 200, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{200}{\text{C.P.}} = \frac{100 + 25}{100 - 12.5}$$

$$\text{C.P.} = \frac{200 \times 87.5}{125}$$

$$\text{C.P.} = \text{₹ } 140$$

- 3.** (2) SP of article

$$= (100 - 20)\% \text{ of } 880$$

$$= 80\% \text{ of } 880$$

$$= 880 \times \frac{80}{100} = \text{₹ } 704$$

Let CP be x

Again, 110% of $x = 704$

$$x = \frac{704}{110} \times 100 = \text{₹ } 640$$

\therefore Original cost = ₹ 640

Aliter : Using Rule 6,

Here, $r = 10\%$, $D = 20\%$,

M.P. = ₹ 880, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{880}{\text{C.P.}} = \frac{100 + 10}{100 - 20}$$

$$\text{C.P.} = \frac{880 \times 80}{110}$$

$$\text{C.P.} = \text{₹ } 640$$

- 4.** (2) Selling Price

$$= \text{₹ } (1100 - 10\% \text{ of } 1100)$$

$$= \text{₹ } (1100 - 110) = \text{₹ } 990$$

Let the cost price = x

$\therefore x + 10\% \text{ of } x = 990$

$$\Rightarrow \frac{11x}{10} = 990$$

$$\Rightarrow x = \frac{990 \times 10}{11} = \text{₹ } 900$$

Aliter : Using Rule 6,

Here, $r = 10\%$, $D = 10\%$,

M.P. = ₹ 1100, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{1100}{\text{C.P.}} = \frac{100 + 10}{100 - 10}$$

$$\text{C.P.} = \frac{1100 \times 90}{110} = \text{₹ } 900$$

DISCOUNT

5. (1) Marked price = ₹ 690
∴ Discount = 10%

$$SP = \frac{690 \times 90}{100} = ₹ 621$$

$$\text{Profit} = 8\%$$

$$\therefore CP = \frac{621}{108} \times 100 = ₹ 575$$

$$\text{Profit without discount} = 690 - 575 = ₹ 115$$

$$\text{Profit per cent}$$

$$= \frac{115}{575} \times 100 = 20\%$$

Aliter (1) : Using Rule 9,

$$\text{Here, } r = 10\%$$

$$R = 20\%$$

Required percentage

$$= \frac{(r + R)}{100 - r} \times 100\%$$

$$= \frac{10 + 20}{100 - 10} \times 100\%$$

$$= \frac{30}{90} \times 100\%$$

$$= 33\frac{1}{3}\%$$

$$\text{Gain \%} = \frac{S.P. - C.P.}{C.P.} \times 100$$

(without discount)

$$= \frac{480 - 400}{400} \times 100$$

$$= \frac{80}{400} \times 100 = 20\%$$

Aliter (2) : Using Rule 6,
Here, M.P. = ₹ 690, D = 10%,
r = 8%

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{690}{C.P.} = \frac{100 + 8}{100 - 10}$$

$$C.P. = \frac{690 \times 90}{108}$$

$$C.P. = ₹ 575$$

Gain % (without discount)

$$= \frac{690 - 575}{575} \times 100\%$$

$$= \frac{115}{575} \times 100\%$$

$$= 20\%$$

6. (2) Let the CP be ₹ 100. Then SP = ₹ 120

Let the marked price be x.

Then, 90% of x = ₹ 120

$$\Rightarrow x = \frac{120 \times 100}{90} = \frac{400}{3}$$

$$= 133\frac{1}{3}$$

It is $33\frac{1}{3}\%$ higher than the CP.

7. (2) $SP = 180 \times \frac{120}{100} = ₹ 216$

$$\therefore 90\% = 216$$

$$100\% = \frac{216}{90} \times 100 = ₹ 240$$

8. (2) CP = ₹ 900

$$\therefore S.P. = 125\% \text{ of } 900$$

$$= \left(\frac{900 \times 125}{100} \right) = ₹ 1125$$

Let the marked price be x

$$\therefore 90\% \text{ of } x = ₹ 1125$$

$$\Rightarrow x = \frac{1125 \times 100}{90} = ₹ 1250$$

9. (4) Let the cost price of article be x

$$\therefore 500 \times \frac{90}{100} = \frac{120}{100} \times x$$

$$\Rightarrow 450 = \frac{6x}{5}$$

$$\Rightarrow x = \frac{450 \times 5}{6} = ₹ 375$$

Aliter : Using Rule 6,

C.P. = ?, M.P. = ₹ 500, r = 20%,
D = 10%

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{500}{C.P.} = \frac{100 + 20}{100 - 10}$$

$$C.P. = \frac{500 \times 90}{120} = ₹ 375$$

10. (2) SP of electric iron = 88% of 300

$$= ₹ \frac{300 \times 88}{100} = ₹ 264$$

Profit = 10%

∴ CP of electric iron

$$= \frac{100}{110} \times 264 = ₹ 240$$

After no discount,

$$\text{Gain} = 300 - 240 = ₹ 60$$

$$\text{Gain per cent} = \frac{60}{240} \times 100 = 25\%$$

Aliter : Using Rule 6,

Here, M.P. = ₹ 300,

r = 10%, D = 12%.

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{300}{C.P.} = \frac{100 + 10}{100 - 12}$$

$$C.P. = \frac{300 \times 88}{110}$$

Gain % (without discount)

$$= \frac{300 - 240}{240} \times 100 = 25\%$$

11. (3) Marked price = ₹ 50

S.P. after discount = 80% of 50 = ₹ 40

If the CP of article be x, then

$$\frac{125 \times x}{100} = 40$$

$$\Rightarrow x = \frac{40 \times 100}{125} = ₹ 32$$

Aliter : Using Rule 6,

Here, M.P. = ₹ 50, C.P. = ?,

r = 25%, D = 20%

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{50}{C.P.} = \frac{100 + 25}{100 - 20}$$

$$C.P. = \frac{50 \times 80}{125} = ₹ 32$$

12. (1) Let the CP be ₹ 100.

$$\therefore SP = ₹ 112$$

If the marked price be x, then

$$90\% \text{ of } x = 112$$

$$\Rightarrow x = \frac{112 \times 100}{90} = ₹ \frac{1120}{9}$$

$$\therefore \text{Required ratio} = 100 : \frac{1120}{9}$$

$$= 900 : 1120 = 45 : 56$$

Aliter : Using Rule 6,

Here, r = 12%

D = 10%

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

DISCOUNT

$$\frac{M.P.}{C.P.} = \frac{100 + 12}{100 - 10}$$

$$\frac{M.P.}{C.P.} = \frac{112}{90}$$

$$\frac{C.P.}{M.P.} = \frac{90}{112}$$

$$\frac{C.P.}{M.P.} = \frac{45}{56}$$

$$C.P. : M.P. = 45 : 56$$

13. (4) If the CP of radio be x , then

$$\frac{108}{100} \text{ of } x = \frac{480 \times 90}{100}$$

$$\Rightarrow \frac{x \times 108}{100} = 432$$

$$\Rightarrow x = \frac{432 \times 100}{108} = ₹ 400$$

Gain per cent (if no discount is

$$\text{allowed}) = \frac{80}{400} \times 100 = 20\%$$

Aliter : Using Rule 6,
Here, $r = 8\%$, $D = 10\%$,
 $M.P. = ₹ 480$

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{480}{C.P.} = \frac{100 + 8}{100 - 10}$$

$$C.P. = \frac{480 \times 90}{108} = ₹ 400$$

$$\text{Gain \%} = \frac{S.P. - C.P.}{C.P.} \times 100$$

(without discount)

$$= \frac{480 - 400}{400} \times 100$$

$$= \frac{80}{400} \times 100 = 20\%$$

14. (1) Let C.P. of article be x

$$\therefore \frac{x \times 104.5}{100} = \frac{275 \times 95}{100}$$

$$\Rightarrow x \times 104.5 = 275 \times 95$$

$$\Rightarrow x = \frac{275 \times 95}{104.5} = ₹ 250$$

Aliter : Using Rule 6,
 $M.P. = ₹ 275$, $D = 5\%$,
 $r = 4.5\%$, $C.P. = ?$

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{275}{C.P.} = \frac{100 + 4.5}{100 - 5}$$

$$C.P. = \frac{275 \times 95}{104.5}$$

$$C.P. = ₹ 250$$

15. (3) Let the marked price be x .

$$\therefore x \times \frac{84}{100} = \frac{1200 \times 112}{100}$$

$$\Rightarrow x \times \frac{84}{100} = 112 \times 12$$

$$\Rightarrow x = \frac{112 \times 1200}{84} = ₹ 1600$$

Aliter : Using Rule 6,
 $C.P. = ₹ 1200$, $r = 12\%$,
 $D = 16\%$

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{M.P.}{1200} = \frac{100 + 12}{100 - 16}$$

$$M.P. = \frac{112 \times 1200}{84} = ₹ 1600$$

16. (1) Let the marked price be ₹100.

$$\therefore S.P. = 90\% \text{ of } 100 = ₹ 90$$

$$\text{Profit} = 17\%$$

$$C.P. = ₹ 90 \times \frac{100}{117}$$

$$= ₹ \frac{1000}{13}$$

If no discount is allowed,
 $S.P. = ₹ 100$

$$\text{Profit} = ₹ \left(100 - \frac{1000}{13} \right)$$

$$= ₹ \frac{300}{13}$$

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

$$= \frac{\frac{300}{13}}{\frac{1000}{13}} \times 100 = 30\%$$

Aliter : Using Rule 6,
Here, $D = 10\%$, $r = 17\%$,
Let the $M.P. = ₹ 100$

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{100}{C.P.} = \frac{100 + 17}{100 - 10}$$

$$\frac{100}{C.P.} = \frac{117}{90}$$

$$C.P. = \frac{100 \times 90}{117}$$

$$= \frac{1000}{13}$$

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

$$= 100 - \frac{1000}{13}$$

$$= \text{Rs. } \frac{300}{13}$$

$$\text{Profit \%} = \frac{\frac{300}{13}}{\frac{1000}{13}} \times 100\%$$

$$= 30\%$$

17. (1) Let the marked price = ₹ 100

$$\therefore S.P. = ₹ 80$$

$$\text{Profit} = 25\%$$

$$\therefore CP = ₹ \left(\frac{100}{125} \times 80 \right) = ₹ 64$$

Profit after selling on marked
price = $100 - 64 = ₹ 36$

$$\therefore \text{Gain \%} = \frac{36}{64} \times 100 = 56.25\%$$

Aliter : Using Rule 6,
Here, $D = 20\%$
 $r = 25\%$

Let, $M.P.$ be ₹ 100

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{100}{C.P.} = \frac{100 + 25}{100 - 20}$$

$$C.P. = \frac{100 \times 80}{125}$$

$$C.P. = ₹ 64$$

$$\text{Profit} = 100 - 64 = 36$$

$$\text{Gain \%} = \frac{36}{64} \times 100\%$$

$$= 56.25\%$$

18. (4) Let the C.P. of article be ₹100 and its marked price be x .

$$\therefore x \times \frac{84}{100} = 105$$

$$\Rightarrow x = \frac{105 \times 100}{84} = 125$$

$$\therefore \text{Required percentage} = 25\%$$

DISCOUNT

Aliter : Using Rule 6,

Here, $r = 5\%$

$D = 16\%$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$= \frac{100 + 5}{100 - 16} = \frac{105}{84}$$

Required Percentage

$$= \frac{105 - 84}{84} \times 100 = 25\%$$

19. (2) Let CP of radio be Rs. x .
According to the question,

$$\frac{108x}{100} = 4800 \times \frac{90}{100} = 4320$$

$$\Rightarrow x = \frac{4320 \times 100}{108} = ₹ 4000$$

If no discount is allowed,
Gain per cent

$$= \frac{800}{4000} \times 100 = 20\%$$

Aliter : Using Rule 6,

M.P. = ₹ 4800, $D = 10\%$, $r = 8\%$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{4800}{\text{C.P.}} = \frac{100 + 8}{100 - 10}$$

$$\text{C.P.} = \frac{4800 \times 90}{108}$$

$$\text{C.P.} = 4000$$

Gain % (without discount)

$$= \frac{4800 - 4000}{4000} \times 100$$

$$= \frac{800}{4000} \times 100$$

$$= 20\%$$

20. (2) S.P. for a profit of 12%

$$= \frac{8000 \times 112}{100} = ₹ 8960$$

$$\therefore \text{Discount} = 11200 - 8960 = ₹ 2240$$

If the discount per cent be x ,
then

$$\frac{11200 \times x}{100} = 2240$$

$$x = \frac{2240 \times 100}{11200} = 20\%$$

Aliter : Using Rule 6,

Here, M.P. = ₹ 11200

C.P. = ₹ 8000

$r = 12\%$

$D = x\%$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{11200}{8000} = \frac{100 + 12}{100 - x}$$

$$= \frac{11200}{8000} = \frac{112}{100 - x}$$

$$100 - x = 80$$

$$\Rightarrow x = 20\%$$

21. (3) Let C.P. of article = ₹ 100

Marked price = x

Single equivalent discount

$$= \left(20 + \frac{25}{4} - \frac{20 \times 25}{400} \right) \%$$

$$= 25\%$$

$$\therefore x \times \frac{75}{100} = 120$$

$$\Rightarrow x = \frac{120 \times 100}{75} = ₹ 160$$

$$\Rightarrow 160 - 100 = 60\%$$

22. (1) If the marked price be x , then

$$x \times \frac{85}{100} = \frac{170 \times 120}{100}$$

$$\Rightarrow x \times 85 = 170 \times 120$$

$$\Rightarrow x = \frac{170 \times 120}{85} = ₹ 240$$

Aliter : Using Rule 6,

Here, $D = 15\%$

$r = 20\%$

C.P. = ₹ 170

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{\text{M.P.}}{170} = \frac{100 + 20}{100 - 15}$$

$$\frac{\text{M.P.}}{170} = \frac{120}{85}$$

$$\text{M.P.} = \frac{120 \times 170}{85}$$

$$\text{M.P.} = ₹ 240$$

23. (1) Let the C.P. be 100 and the marked price be x .

$$\therefore x \times \frac{88}{100} = 132$$

$$\Rightarrow x = \frac{132 \times 100}{88}$$

$$= 150 \text{ i.e., more by } 50\%$$

Aliter : Using Rule 9,

Here, $r = 12\%$

$R = 32\%$

Required percentage

$$= \left(\frac{r + R}{100 - r} \times 100 \right) \%$$

$$= \left(\frac{12 + 32}{100 - 12} \right) \times 100\%$$

$$= \frac{44}{88} \times 100 = 50\%$$

24. (3) C.P. of article = ₹ 100

Marked price be x

$$\therefore \frac{x \times 88}{100} = 121$$

$$\Rightarrow x = \frac{121 \times 100}{88} = ₹ 137.5$$

i.e. 37.5% above C.P.

Aliter : Using Rule 9,

Here, $r = 12\%$

$R = 21\%$

Required percentage

$$= \left(\frac{r + R}{100 - r} \times 100 \right) \%$$

$$= \left(\frac{12 + 21}{100 - 12} \right) \times 100\%$$

$$= \frac{33}{88} \times 100\%$$

$$= \frac{3}{8} \times 100$$

$$= \frac{300}{8} \% = 37.5\%$$

25. (1) Let the C.P. of TV be x , then

$$\frac{x \times 110}{100} = 2640 \times \frac{95}{100}$$

$$\Rightarrow x = \frac{2640 \times 95}{110} = ₹ 2280$$

Aliter : Using Rule 6,

Here, $r = 10\%$, $D = 5\%$,

DISCOUNT

M.P. = ₹ 264000, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{2640}{\text{C.P.}} = \frac{100 + 10}{100 - 5}$$

$$\text{C.P.} = \frac{2640 \times 95}{110}$$

$$= 24 \times 95 = 2280$$

26. (1) If the C.P. of grinder be x , then

$$\frac{x \times 108}{100} = \frac{3600 \times 90}{100} = 3240$$

$$\Rightarrow x = \frac{3240 \times 100}{108} = ₹ 3000$$

Aliter : Using Rule 6,

M.P. = ₹ 3600, $D = 10\%$,

$r = 8\%$, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{3600}{\text{C.P.}} = \frac{100 + 8}{100 - 10}$$

$$\text{C.P.} = \frac{3600 \times 90}{108}$$

$$= \frac{3600 \times 10}{12}$$

$$= ₹ 3000$$

27. (3) Let C.P. of article = ₹ 100

If the marked price of article be x , then

$$x \times \frac{75}{100} = 120$$

$$\Rightarrow x = \frac{120 \times 100}{75} = 160$$

i.e. 60% above the cost price

Aliter : Using Rule 9,

$r = 25\%$, $R = 20\%$

Required percentage

$$= \left(\frac{r + R}{100 - r} \times 100 \right) \%$$

$$= \left(\frac{25 + 20}{100 - 25} \times 100 \right) \%$$

$$= \frac{45}{75} \times 100$$

$$= 60\%$$

28. (3) If the C.P. of goods be ₹ 100, then

Marked price = ₹ 120

$$\therefore \text{S.P.} = \frac{120 \times 85}{100} = ₹ 102$$

Hence, Profit per cent = 2%

Aliter : Using Rule 8,

Here, $r = 20\%$, $r_1 = 15\%$

$$\text{Gain \%} = \frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{20 \times (100 - 15)}{100} - 15$$

$$= \frac{20 \times 85}{100} - 15$$

$$= 17 - 15 = 2\%$$

29. (4) Cost price of article = ₹ x

$$\therefore x \times \frac{140}{100} \times \frac{95}{100} = 1064$$

$$\Rightarrow x = \frac{1064 \times 100 \times 100}{140 \times 95}$$

$$= ₹ 800$$

30. (2) Present worth = 1860 - 60

$$= ₹ 1800$$

$$\text{Time} = \frac{100 \times \text{True Discount}}{\text{Present worth} \times \text{Rate}}$$

$$= \frac{100 \times 60}{1800 \times 5} = \frac{2}{3} \text{ year}$$

$$= \left(\frac{2}{3} \times 12 \right) \text{ months} = 8 \text{ months}$$

31. (4) Marked price of the article = ₹ x

$$\text{Discount} = 24 \frac{1}{2} \% = \frac{49}{2} \%$$

$$\therefore \left(100 - \frac{49}{2} \right) \% \text{ of } x = 1510$$

$$\Rightarrow x \times \left(\frac{200 - 49}{200} \right) = 1510$$

$$\Rightarrow x \times \frac{151}{200} = 1510$$

$$\Rightarrow x = \frac{1510 \times 200}{151} = ₹ 2000$$

$$\therefore \text{C.P. of article} = \frac{1510 \times 100}{90}$$

$$= ₹ \frac{15100}{9}$$

$$\therefore \text{Gain} = 2000 - \frac{15100}{9}$$

$$= \frac{18000 - 15100}{9} = \frac{2900}{9}$$

$$= ₹ 322 \frac{2}{9}$$

32. (3) Original marked price of goods = ₹ 100

$$\text{C.P.} = \frac{100 \times 80}{100} = ₹ 80$$

Case II,

If the marked price be ₹ x , then

$$x \times \frac{80}{100}$$

$$= \frac{80 \times 125}{100}$$

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

Percent = 125 - 100 = 25 %

33. (3) Marked price = ₹ x and cost price = ₹ y .

$\therefore 50\% \text{ of } x = 90\% \text{ of } y$

$$\Rightarrow \frac{x \times 50}{100} = \frac{y \times 90}{100}$$

$$\Rightarrow y = \frac{x \times 50}{90} = ₹ \frac{5}{9} x$$

$$= \frac{5}{9} \text{ th of marked price.}$$

34. (2) Marked price

$$= ₹ (7710 + 1285)$$

$$= ₹ 8995$$

If discount = $x\%$, then

$x\% \text{ of } 8995 = 1285$

$$\Rightarrow \frac{8995 \times x}{100} = 1285$$

$$\Rightarrow x = \frac{1285 \times 100}{8995} = \frac{100}{7} = 14 \frac{2}{7} \%$$

35. (2) Let the marked price be ₹ x .

$$\therefore x \times \frac{90}{100} = 2700$$

$$\Rightarrow x = \frac{2700 \times 100}{90} = ₹ 3000$$

36. (1) S.P. of saree

= (100 - 20)% of 200

$$= \frac{200 \times 80}{100} = ₹ 160$$

$\therefore \text{C.P. of saree} = 160 - 16$

DISCOUNT

$$= ₹ 144$$

$$\therefore \text{Profit percent} = \frac{16}{144} \times 100$$

$$= \frac{100}{9} = 11\frac{1}{9}\%$$

37. (2) C.P. of article = ₹ x
According to question,
92% of marked price

$$= \frac{115}{100} \times \text{C.P.}$$

$$\therefore \frac{250 \times 92}{100} = \frac{115x}{100}$$

$$\Rightarrow 115x = 250 \times 92$$

$$\Rightarrow x = \frac{250 \times 92}{115} = ₹ 200$$

Aliter : Using Rule 6,

Here, $r = 15\%$, $D = 8\%$,

M.P. = ₹ 250, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{250}{\text{C.P.}} = \frac{100 + 15}{100 - 8}$$

$$\text{C.P.} = \frac{250 \times 92}{115}$$

$$\text{C.P.} = ₹ 200$$

38. (3) Greatest possible original price will be when discount be maximum

If the price be Rs. x , then

$$\frac{75}{100} \text{ of } x = 270$$

$$\Rightarrow x = \frac{270 \times 100}{75} = \text{Rs. } 360$$

39. (3) C.P. of article = Rs. x (let)
According to the question,

$$x \times \frac{120}{100} = \frac{40 \times 90}{100}$$

$$\Rightarrow x = \frac{40 \times 90}{120} = \text{Rs. } 30$$

Aliter : Using Rule 6,

Here, $D = 10\%$, $r = 20\%$,

M.P. = Rs. 40, C.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{40}{\text{C.P.}} = \frac{100 + 20}{100 - 10}$$

$$\text{C.P.} = \frac{40 \times 90}{120}$$

$$\text{C.P.} = \text{Rs. } 30$$

40. (1) Let the C.P. of article be Rs. x and its marked price be Rs. y .
According to the question,
90% of $y = 112\%$ of x
 $\Rightarrow 90 \times y = 112 \times x$

$$\Rightarrow \frac{x}{y} = \frac{90}{112} = 45 : 56$$

41. (4) Let the marked price of article be Rs. x .

According to the question,

$$\left(100 - \frac{50}{3}\right)\% \text{ of } x = 450$$

$$\Rightarrow x \times \left(\frac{300 - 50}{3}\right)\% = 450$$

$$\Rightarrow x \times \frac{250}{300} = 450$$

$$\Rightarrow x \times \frac{5}{6} = 450$$

$$\Rightarrow x = \frac{450 \times 6}{5} = \text{Rs. } 540$$

42. (3) Let the marked price of article be Rs. x .

According to the question,

90% of $x = 120\%$ of 1900

$$\Rightarrow x \times \frac{90}{100} = \frac{900 \times 120}{100}$$

$$\Rightarrow x = \frac{900 \times 120}{90} = \text{Rs. } 1200$$

TYPE-IV

1. (3) Suppose printed price = ₹ 100
 \therefore S.P. = ₹ $(100 - 2.5) = ₹ 97.5$

$$\therefore \text{Marked Price} = \frac{100 \times 39}{97.5}$$

$$= ₹ 40$$

2. (3) Printed price = ₹ 900
On 40% discount

$$= 900 - \frac{900 \times 40}{100} = 900 - 360$$

$$\text{C.P. for retailer} = 540$$

$$\text{S.P.} = 900$$

$$\text{Profit} = 900 - 540 = 360$$

$$\text{Gain \%} = \frac{360 \times 100}{540}$$

$$= \frac{200}{3} = 66\frac{2}{3}\%$$

3. (2) Let the marked price of each pen be x
Total cost price of 40 pens = Total

marked price of 36 pens = $36x$
Selling price of 1 pen after 1% discount = $(1 - 0.01)x = 0.99x$
Selling price of 40 pens
 $= 40 \times 0.99x = 39.6x$

$$\text{Profit} = \frac{39.6 - 36}{36} \times 100$$

$$= \frac{3.6}{36} \times 100 = 10\%$$

4. (1) First discount = 20%
Price after first discount

$$= ₹ \left(1500 - \frac{20}{100} \times 1500\right)$$

$$= ₹ (1500 - 300) = ₹ 1200$$

Let the additional discount be $x\%$

$$\therefore \left(1200 - \frac{x \times 1200}{100}\right) = 1104$$

$$\Rightarrow 1200 - 12x = 1104$$

$$\Rightarrow 12x = 1200 - 1104 = 96$$

$$\Rightarrow x = \frac{96}{12} = 8\%$$

5. (3) Let the printed price of the article be ₹ 100

Discount = 40%

$$\text{C.P.} = ₹ (100 - 40) = ₹ 60$$

$$\text{S.P.} = ₹ 100$$

$$\therefore \text{Gain \%} = \frac{40}{60} \times 100$$

$$= \frac{200}{3} = 66\frac{2}{3}\%$$

6. (4) Discount

$$= 120 \times \frac{40}{100} = ₹ 48$$

$$\therefore \text{S.P.} = ₹ (120 - 48) = ₹ 72$$

$$\text{Loss} = 80 - 72 = ₹ 8$$

$$\therefore \text{Loss \%} = \frac{8}{80} \times 100 = 10\%$$

Aliter : Using Rule 6,

Here, C.P. = Rs. 80, M.P. =

Rs. 120, $D = 40\%$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{120}{80} = \frac{100 + r}{100 - 40}$$

$$\frac{3}{2} = \frac{100 + r}{60}$$

$$90 = 100 + r$$

$$r = -10\% \text{ (-ve sign shows loss)}$$

$$\Rightarrow \text{Loss} = 10\%$$

DISCOUNT

7. (1) Let the marked price be x
 $\therefore 86\%$ of $x = 387$

$$\therefore x = \frac{387 \times 100}{86} = ₹ 450$$

Aliter : Using Rule 2,
 Here, $D = 14\%$, $S.P. = ₹ 387$,
 $M.P. = ?$

$$\begin{aligned} M.P. &= \frac{S.P. \times 100}{100 - D} \\ &= \frac{387 \times 100}{100 - 14} \\ &= \frac{38700}{86} = ₹ 450 \end{aligned}$$

8. (4) C.P. = ₹ 900
 Gain = 10%

$$\therefore S.P. = ₹ \left(\frac{110}{100} \times 900 \right) = ₹ 990$$

Let the marked price be x .

$$\therefore \frac{90}{100}x = 990$$

$$\therefore x = \frac{990 \times 100}{90} = ₹ 1100$$

Aliter : Using Rule 6,
 Here, $D = 10\%$, C.P. = ₹ 900,
 $R = 10\%$, $M.P. = ?$

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$\frac{M.P.}{900} = \frac{100 + 10}{100 - 10}$$

$$M.P. = \frac{110}{90} \times 900$$

$$M.P. = ₹ 1100$$

9. (3) Let the C.P. of each article be ₹ 1

For 15 books, the tradesman gives 1 book free.

$$\therefore \text{C.P. of 15 books} = ₹ 16$$

$$\therefore \text{S.P. of 15 books}$$

$$= 16 \times \frac{135}{100} = ₹ \frac{108}{5}$$

$$\therefore \text{S.P. of 1 book} = \frac{108}{5 \times 15}$$

$$= ₹ \frac{36}{25}$$

$$\text{Now, } 96\% \text{ of marked price} = \frac{36}{25}$$

$$\therefore \text{Marked price} = \frac{36 \times 100}{25 \times 96} = \frac{3}{2}$$

$$= ₹ 1.5$$

$$\therefore \text{The required \% increase}$$

$$= \frac{0.5}{1} \times 100 = 50\%$$

10. (3) Discount on ₹ 36000

$$= \frac{36000 \times 7}{100} = ₹ 2520$$

Discount on first ₹ 20,000

$$= \frac{20000 \times 8}{100} = ₹ 1600$$

Discount on next ₹ 10,000

$$= \frac{10,000 \times 5}{100} = ₹ 500$$

$$\therefore \text{Discount on remaining ₹ 6,000}$$

$$= 2520 - (1600 + 500) = ₹ 420$$

\therefore Required percent

$$= \frac{420 \times 100}{6000} = 7\%$$

11. (1) Let the C.P. be ₹ 100

$$\therefore \text{Marked price} = ₹ 125$$

$$S.P. = 8\% \text{ of } 125$$

$$= \frac{84 \times 125}{100} = ₹ 105$$

$$\therefore \text{Profit} = ₹ (105 - 100) = ₹ 5$$

$$\therefore \text{Profit \%} = 5\%$$

12. (1) Let the marked price of the shirt be Rs. x .

According to the question,

$$x \times \frac{20}{100} = 150$$

$$\Rightarrow x = \frac{150 \times 100}{20} = 750$$

$$\therefore \text{Price paid} = ₹ (750 - 150)$$

$$= ₹ 600$$

13. (3) CP of the article for Ravi

$$= 660 \times \frac{100}{110} = ₹ 600$$

Ravi bought the article at the discount of 25%

$$\therefore 75\% \text{ of marked price} = ₹ 600$$

$$\text{Marked price} = \frac{600 \times 100}{75} = ₹ 800$$

14. (1) Let the marked price of the article be x .

Equivalent discount for successive discounts of 30% and 20%

$$= \left(30 + 20 - \frac{30 \times 20}{100} \right) \%$$

$$= (50 - 6)\% = 44\%$$

$$\Rightarrow (100 - 44)\% \text{ of } x = 2240$$

$$\Rightarrow \frac{x \times 56}{100} = 2240$$

$$\Rightarrow x = \frac{2240 \times 100}{56} = ₹ 4000$$

15. (4) Let the market price of the cooler be x ,

According to the question,
 $(12 - 10)\%$ of $x = 35$

$$\Rightarrow \frac{x \times 2}{100} = 35$$

$$\Rightarrow x = \frac{3500}{2} = ₹ 1750$$

16. (1) Let the CP of article be x and its marked price be y .

According to the question,
 90% of $y = 115\%$ of x

$$\Rightarrow \frac{y \times 90}{100} = \frac{x \times 115}{100}$$

$$\Rightarrow \frac{x}{y} = \frac{90}{115} = \frac{18}{23} \Rightarrow 18:23$$

Aliter : Using Rule 6,
 Here, $r = 15\%$, $D = 10\%$

$$\frac{M.P.}{C.P.} = \frac{100 + r}{100 - D}$$

$$= \frac{100 + 15}{100 - 10}$$

$$\frac{M.P.}{C.P.} = \frac{115}{90}$$

$$\frac{C.P.}{M.P.} = \frac{90}{115}$$

$$\frac{C.P.}{M.P.} = \frac{18}{23}$$

$$\Rightarrow C.P. : M.P. = 18 : 23$$

17. (1) Let the marked price of the shirt be x .

Difference of discounts = 2%

$$\therefore 2\% \text{ of } x = 15$$

$$\Rightarrow \frac{x \times 2}{100} = 15$$

$$\Rightarrow x = \frac{15 \times 100}{2} = ₹ 750$$

18. (2) If the marked price of the article be x , then

$$96\% \text{ of } x = 1920$$

$$\Rightarrow \frac{x \times 96}{100} = 1920$$

$$\Rightarrow x = \frac{1920 \times 100}{96} = ₹ 2000$$

DISCOUNT

Aliter : Using Rule 2,

$$\text{S.P.} = ₹ 1920$$

$$D = 4\%$$

$$\text{M.P.} = ?$$

$$\begin{aligned}\text{M.P.} &= \frac{\text{S.P.} \times 100}{100 - D} \\ &= \frac{1920 \times 100}{100 - 4} \\ &= \frac{1920 \times 100}{96} = ₹ 2000\end{aligned}$$

19. (1) Discount = 650 - 572 = ₹ 78

If the discount be $x\%$ then

$$\frac{650 \times x}{100} = 78$$

$$\Rightarrow x = \frac{78 \times 100}{650} = 12\%$$

Aliter : Using Rule 1,

Here, M.P. = ₹ 650

S.P. = ₹ 572

$$\text{Discount \%} = \frac{\text{M.P.} - \text{S.P.}}{\text{M.P.}} \times 100$$

$$= \frac{650 - 572}{650} \times 100$$

$$= \frac{7800}{650} = 12\%$$

20. (1) Let marked price of article = ₹ 100

∴ C.P. of article = ₹ 64

∴ S.P. of article = ₹ 88

∴ Profit per cent

$$= \frac{88 - 64}{64} \times 100 = 37.5\%$$

21. (3) Let the marked price of watch be x .

$$\therefore \frac{x \times 95}{100} - \frac{x \times 94}{100} = 15$$

$$\Rightarrow x = 15 \times 100 = ₹ 1500$$

22. (3) Discount = 15%

SP of racket = 85% of ₹ 30

= ₹ 25.50

One shuttle cock of ₹ 1.50 is free.

∴ Actual SP

= ₹ (25.50 - 1.50) = ₹ 24

He still gains 20%

$$\therefore \text{CP} = \frac{100}{120} \times 24 = ₹ 20$$

23. (3) Let the marked price of the article be x

According to the question,

$$96\% \text{ of } x = 120\% \text{ of } 100$$

$$\Rightarrow x \times \frac{96}{100} = \frac{100 \times 120}{100}$$

$$\Rightarrow x = \frac{100 \times 120}{96} = ₹ 125$$

Aliter : Using Rule 6,

Here, $r = 20\%$, $D = 4\%$,

C.P. = ₹ 100, M.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{\text{M.P.}}{100} = \frac{100 + 20}{100 - 4}$$

$$\text{M.P.} = \frac{120 \times 100}{96}$$

$$= \frac{1000}{8}$$

$$\text{M.P.} = ₹ 125$$

24. (1) Let the marked price be x .

$$\therefore \frac{x \times 85}{100} = 629$$

$$\Rightarrow x = \frac{629 \times 100}{85} = ₹ 740$$

Aliter : Using Rule 2,

M.P. = ? , S.P. = ₹ 629,

$D = 15\%$

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$= \frac{629 \times 100}{100 - 15}$$

$$= \frac{62900}{85} = ₹ 740$$

25. (1) Let the cost price of toy be ₹ 100 and the marked price be x .

$$\therefore \frac{x \times 90}{100} = 120$$

$$\Rightarrow x = \frac{120 \times 100}{90} = ₹ \frac{400}{3}$$

S.P. after a discount of 20%

$$= 80\% \text{ of } \frac{400}{3}$$

$$= \frac{400 \times 80}{300} = \frac{320}{3} = 106\frac{2}{3}$$

∴ Profit percent

$$= 106\frac{2}{3} - 100 = 6\frac{2}{3}\%$$

26. (3) If the marked price of article be x , then

$$\frac{x \times 76}{100} = 342$$

$$\Rightarrow x = \frac{342 \times 100}{76} = ₹ 450$$

Aliter : Using Rule 2,

Here, $D = 24\%$, S.P. = ₹ 342,

M.P. = ?

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$= \frac{342 \times 100}{100 - 24}$$

$$= \frac{34200}{76} = ₹ 450$$

27. (4) If the marked price of T.V. be x , then,

$$\frac{x \times 5}{100} = 500$$

$$\Rightarrow x = \frac{500 \times 100}{5}$$

$$= ₹ 10000$$

∴ Initial S.P. of T.V.

$$= \frac{10000 \times 80}{100} = ₹ 8000$$

28. (2) Let marked price of toy be x

$$\therefore \text{S.P.} = x \times \frac{77}{100} = \frac{77x}{100}$$

$$\text{C.P.} = x \times \frac{77}{100} \times \frac{100}{110} = \frac{7x}{10}$$

$$\therefore \frac{77x}{100} - \frac{7x}{10} = 56$$

$$\Rightarrow \frac{7x}{100} = 56$$

$$\Rightarrow x = \frac{100 \times 56}{7} = ₹ 800$$

29. (1) Let the amount paid (s.p.) be x

$$\therefore 16\% \text{ of } x = 80$$

$$\Rightarrow x = \frac{80}{16} \times 100$$

$$\therefore x = ₹ 500$$

30. (3) Marked price

$$= \frac{100}{100 - 12} \times 880 = ₹ 1000$$

Aliter : Using Rule 2,

Here, S.P. = ₹ 880, $D = 12\%$,

M.P. = ?

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$= \frac{880 \times 100}{100 - 12} = ₹ 1000$$

DISCOUNT

31. (1) Marked price

$$= \frac{846 \times 100}{94} = ₹ 900$$

32. (1) Difference of discounts

$$= \left(25 - \frac{50}{3} \right) \% = \frac{25}{3} \%$$

Let the marked price be x , then

$$x \times \frac{25}{300} = 600$$

$$\Rightarrow x = ₹ 7200$$

\therefore Required S.P.

$$= 7200 \times \left(100 - \frac{50}{3} \right) \%$$

$$= \frac{7200 \times 250}{300} = ₹ 6000$$

33. (3) Marked price

$$= \frac{100}{(100 - 7.5)} \times 740$$

$$= \frac{740 \times 100}{92.5} = ₹ 800$$

Aliter : Using Rule 2,

Here, S.P. = ₹ 740, D = 7.5%,
M.P. = ?

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$= \frac{740 \times 100}{100 - 7.5}$$

$$= \frac{74000}{92.5}$$

$$\text{M.P.} = ₹ 800$$

34. (3) S.P. of the fan = $\frac{150 \times 80}{100}$

$$= ₹ 120$$

Aliter : Using Rule 2,

M.P. = ₹ 150, D = 20%, S.P. = ?

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$150 = \frac{\text{S.P.} \times 100}{100 - 20}$$

$$\text{S.P.} = \frac{150 \times 80}{100}$$

$$\text{S.P.} = ₹ 120$$

35. (3) Discount = 6000 - 5500
= ₹ 500

If discount = $x\%$, then

$$\frac{6000 \times x}{100} = 500$$

$$\Rightarrow x = \frac{500}{60} = \frac{25}{3} = 8\frac{1}{3} \%$$

Aliter : Using Rule 1,

M.P. = ₹ 6000

S.P. = ₹ 5500

$$\text{Discount \%} = \frac{\text{M.P.} - \text{S.P.}}{\text{M.P.}} \times 100$$

$$= \frac{6000 - 5500}{6000} \times 100$$

$$= \frac{500 \times 100}{6000}$$

$$= 8\frac{1}{3} \%$$

36. (3) Marked price

$$= \frac{6580 \times 100}{70} = ₹ 9400$$

Aliter : Using Rule 2,

D = 30%, S.P. = 6580,

M.P. = ?

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$= \frac{6580 \times 100}{100 - 30}$$

$$= \frac{658000}{70} = ₹ 9400$$

37. (4) Using Rule 1,

Discount = 800 - 736 = ₹ 64

\therefore Discount percent

$$= \frac{64}{800} \times 100 = 8 \%$$

38. (2) Using Rule 1,

Required discount

$$= \frac{475 \times 15}{100} = ₹ 71.25$$

39. (3) Price after discount of 10%

$$= \frac{6800 \times 90}{100} = ₹ 6120$$

If the seasonal discount be $x\%$,
then

$$\frac{6120 \times x}{100} = 6120 - 5202 = 918$$

$$\Rightarrow x = \frac{918 \times 100}{6120} = 15 \%$$

40. (3) Marked price of the article = ₹ x .

$$\therefore \frac{x \times 90}{100} = \frac{360 \times 125}{100}$$

$$\Rightarrow \frac{9x}{10} = 90 \times 5$$

$$\Rightarrow x = \frac{90 \times 5 \times 10}{9} = ₹ 500$$

Aliter : Using Rule 6,

C.P. = ₹ 360

$r = 25\%$, $D = 10\%$, M.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{\text{M.P.}}{360} = \frac{100 + 25}{100 - 10}$$

$$\text{M.P.} = \frac{125 \times 360}{90}$$

$$\text{M.P.} = ₹ 500$$

41. (2) Rate of discount = $x\%$

$$\therefore 1200 \times \frac{x}{100} = 1200 - 1100$$

$$\Rightarrow 12x = 100$$

$$\Rightarrow x = \frac{100}{12} = \frac{25}{3} = 8\frac{1}{3} \%$$

Aliter : Using Rule 1,

Here, M.P. = ₹ 1200,

S.P. = ₹ 1100

$$\text{Discount \%} = \frac{\text{M.P.} - \text{S.P.}}{\text{M.P.}} \times 100$$

$$= \frac{1200 - 1100}{1200} \times 100$$

$$= \frac{100 \times 100}{1200} = 8\frac{1}{3} \%$$

42. (4) C.P. of item = ₹ 100 (let)

\therefore Marked price of item = ₹ 200

S.P. for a gain of 15% = ₹ 115

\therefore Discount = 200 - 115 = ₹ 85

If discount percent be $x\%$, then

$$\frac{200 \times x}{100} = 85$$

$$\Rightarrow 2x = 85 \Rightarrow x = \frac{85}{2} = 42.5 \%$$

Aliter : Using Rule 6,

Let, C.P. = ₹ x ,

M.P. = ₹ $2x$, $r = 15\%$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{2x}{x} = \frac{100 + 15}{100 - D}$$

$$200 - 2D = 115$$

$$2D = 85$$

$$D = 42.5 \%$$

DISCOUNT

43. (2) Discount = 270 - 237.60
= Rs. 32.4

If the rate of discount be $x\%$, then

$$270 \times \frac{x}{100} = 32.4$$

$$\Rightarrow x = \frac{32.4 \times 100}{270} = 12\%$$

Aliter : Using Rule 1,
Here, S.P. = Rs. 237.60,
M.P. = Rs. 270
Discount %

$$= \frac{\text{M.P.} - \text{S.P.}}{\text{M.P.}} \times 100\%$$

$$= \frac{270 - 237.60}{270} \times 100\%$$

$$= \frac{32.40 \times 100}{270}\%$$

$$= 12\%$$

44. (2) Let the marked price of article be Rs. x

According to the question,

$$\frac{x \times 75}{100} = \frac{1440 \times 125}{100}$$

$$\Rightarrow x = \frac{1440 \times 125}{75} = \text{Rs. } 2400$$

Aliter : Using Rule 6,
Here, $D = 25\%$, $r = 25\%$, C.P.
= Rs. 1440, M.P. = ?

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{\text{M.P.}}{1440} = \frac{100 + 25}{100 - 25}$$

$$\text{M.P.} = \frac{125 \times 1440}{75}$$

$$= \text{Rs. } 2400$$

45. (4) Marked price = Rs. 720

Discount = 10%

\therefore After a discount of 10%,

$$\text{S.P.} = \text{Rs. } \left(\frac{720 \times 90}{100} \right)$$

$$= \text{Rs. } 648$$

$$\text{Final S.P.} = \text{Rs. } 550.80$$

$$\therefore \text{Discount} = \text{Rs. } (648 - 550.80)$$

$$= \text{Rs. } 97.2$$

If the second discount be $x\%$, then

$$\frac{648 \times x}{100} = 97.2$$

$$\Rightarrow x = \frac{97.2 \times 100}{648} = 15\%$$

Aliter : Using Rule 3,

$$\text{S.P.} = \text{Rs. } 550.80, \text{ M.P.} = \text{Rs. } 720$$

$$D_1 = 10\%, D_2 = ?$$

$$\text{S.P.} = \text{M.P.} \left(\frac{100 - D_1}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$550.80 = 720 \left(\frac{100 - 10}{100} \right) \left(\frac{100 - D_2}{100} \right)$$

$$\frac{550.80 \times 100 \times 100}{720 \times 90}$$

$$= 100 - D_2$$

$$85 = 100 - D_2$$

$$D_2 = 100 - 85$$

$$D_2 = 15\%$$

46. (3) C.P. of article = Rs. x (let).

According to the question,

$$\frac{x \times 75}{100} = 3600$$

$$\Rightarrow x = \frac{3600 \times 100}{75} = \text{Rs. } 4800$$

Aliter : Using Rule 2,

Here, S.P. = Rs. 3600

$$D = 25\%$$

$$\text{M.P.} = ?$$

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$\text{M.P.} = \frac{3600 \times 100}{100 - 25}$$

$$\text{M.P.} = \frac{360000}{75}$$

$$= \text{M.P.} = \text{Rs. } 4800$$

47. (2) Rate of discount = 12%

\therefore S.P. of TV set

$$= 6500 \times (100 - 12)\%$$

$$= \frac{6500 \times 88}{100} = \text{Rs. } 5720$$

Aliter : Using Rule 2,

Here, $D = 12\%$,

$$\text{M.P.} = \text{Rs. } 6500, \text{ S.P.} = ?$$

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$6500 = \frac{\text{S.P.} \times 100}{100 - 12}$$

$$\text{S.P.} = \frac{6500 \times 88}{100}$$

$$\text{S.P.} = \text{Rs. } 5720$$

48. (2) S.P. of TV set

$$= \text{Rs. } \left(\frac{120}{20} \times 750 \right)$$

$$= \text{Rs. } 4500$$

If the marked price be Rs. x , then

$$\frac{x \times 90}{100} = 4500$$

$$\Rightarrow x = \frac{4500 \times 100}{90}$$

$$= \text{Rs. } 5000$$

49. (3) Let the C.P. of each article be Rs. 100.

$$\therefore \text{Marked price} = \text{Rs. } 125$$

On giving discount,

$$\text{S.P.} = \text{Rs. } 112.5$$

\therefore Discount

$$= 125 - 112.5 = \text{Rs. } 12.5$$

$$\text{i.e., } 12\frac{1}{2}\%$$

50. (2) Let the marked price of radio be Rs. x .

According to the question,

$$80\% \text{ of } x = 1200$$

$$\Rightarrow \frac{x \times 80}{100} = 1200$$

$$\Rightarrow x = \frac{1200 \times 100}{80} = \text{Rs. } 1500$$

Aliter : Using Rule 2,

Here, $D = 20\%$,

$$\text{S.P.} = \text{Rs. } 1200, \text{ M.P.} = ?$$

$$\text{M.P.} = \frac{\text{S.P.} \times 100}{100 - D}$$

$$= \frac{1200 \times 100}{100 - 20}$$

$$\text{M.P.} = \frac{120000}{80}$$

$$\text{M.P.} = \text{Rs. } 1500$$

51. (2) Marked price = Rs. 250

$$\text{S.P.} = \text{Rs. } 225$$

$$\text{Discount} = 250 - 225 = \text{Rs. } 25$$

If the rate of discount be $x\%$, then

$$\frac{250 \times x}{100} = 25$$

$$\Rightarrow x = \frac{25 \times 100}{250} = 10\%$$

Aliter : Using Rule 1,

Here, M.P. = Rs. 250,

$$\text{S.P.} = \text{Rs. } 225$$

DISCOUNT

$$\text{Discount \%} = \frac{\text{M.P.} - \text{S.P.}}{\text{M.P.}} \times 100\%$$

$$= \frac{250 - 225}{250} \times 100\% \\ = 10\%$$

- 52.** (3) Let the C.P. of article be Rs. 100.

∴ Marked price = Rs. 130

$$\text{S.P.} = \frac{130 \times 90}{100} = \text{Rs. } 117$$

∴ Profit% = 17%

OR

Required profit percent

$$= \left(x + y + \frac{xy}{100} \right) \%$$

$$= \left(30 - 10 - \frac{30 \times 10}{100} \right) \% = 17\%$$

Aliter : Using Rule 8,

Here, $r = 30\%$

$r_1 = 10\%$

Profit % =

$$\frac{r \times (100 - r_1)}{100} - r_1$$

$$= \frac{30 \times (100 - 10)}{100} - 10$$

$$= \frac{30 \times 90}{100} - 10 = 17\%$$

- 53.** (3) Let the marked price of article be Rs. x .

According to the question,

$$x \times \frac{80}{100} = 740$$

$$\Rightarrow x = \text{Rs. } \left(\frac{740 \times 100}{80} \right)$$

= Rs. 925

- 54.** (2) Let the marked price of the shirt be Rs. x .

According to the question,

$(100 - 15)\%$ of $x = 119$

$$\Rightarrow x \times \frac{85}{100} = 119$$

$$\Rightarrow x = \frac{119 \times 100}{85} = \text{Rs. } 140$$

- 55.** (3) Discount on marked price

$$= \text{Rs. } \left(\frac{3600 \times 2.5}{100} \right) = \text{Rs. } 90$$

∴ S.P. of cycle

= Rs. $(3600 - 90)$

= Rs. 3510

- 56.** (3) Let the C.P. of article be Rs. 100.

∴ Its marked price = Rs. 110

S.P. after a discount of 10%

$$= \text{Rs. } \left(\frac{110 \times 90}{100} \right)$$

= Rs. 99

∴ Loss = Rs. $(100 - 99)$

= Re. 1 i.e., 1%

- 57.** (4) Marked price of shirt

= Rs. $(576 + 109)$

= Rs. 685

Let the rate of discount be $x\%$.

∴ $x\%$ of 685 = 109

$$\Rightarrow \frac{685 \times x}{100} = 109$$

$$\Rightarrow x = \frac{109 \times 100}{685} = 16\%$$

- 58.** (1) Let the C.P. of article be Rs. 100 and the marked price be Rs. x .

According to the question,

$$95\% \text{ of } x = \frac{100 \times 133}{100}$$

$$\Rightarrow \frac{x \times 95}{100} = 133$$

$$\Rightarrow x = \frac{133 \times 100}{95} = \text{Rs. } 140 \text{ i.e.,}$$

40% above than C.P.

- 59.** (3) S.P. of ceiling fan = $(100 - 5)\%$ of Rs. 1200

$$= \text{Rs. } \left(\frac{1200 \times 95}{100} \right)$$

= Rs. 1140

- 60.** (2) Let the marked price of article be Rs. x .

According to the question,

$x \times (100 - 86)\% = 42$

$$\Rightarrow \frac{x \times 14}{100} = 42$$

$$\Rightarrow x = \frac{42 \times 100}{14} = \text{Rs. } 300$$

- 61.** (3) Let the marked price of watch be Rs. x .

According to the question,

$(7 - 5)\%$ of $x = 15$

$$\Rightarrow \frac{x \times 2}{100} = 15$$

$$\Rightarrow x = \frac{15 \times 100}{2} = \text{Rs. } 750$$

- 62.** (1) Let the marked price of article be Rs. x .

According to the question,

$$x \times \frac{80}{100} = \frac{200 \times 120}{100}$$

$$\Rightarrow x = \text{Rs. } \left(\frac{200 \times 120}{80} \right) = \text{Rs. } 300$$

- 63.** (2) Let the marked price of article be Rs. x and the C.P. be Rs. 100.

According to the question,

$(100 - 32)\%$ of $x = 100$

$$\Rightarrow \frac{x \times 68}{100} = 100$$

$$\Rightarrow x \times 68 = 100 \times 100$$

$$\Rightarrow x = \frac{100 \times 100}{68} = \frac{2500}{17}$$

= Rs. 147.05

i.e., 47.05% above the cost price.

- 64.** (3) Discount = Rs. $(1200 - 960)$ = Rs. 240

If the rate of discount be $x\%$, then

$x\%$ of 1200 = 240

$$\Rightarrow \frac{1200 \times x}{100} = 240$$

$$\Rightarrow 12x = 240$$

$$\Rightarrow x = \frac{240}{12} = 20\%$$

- 65.** (2) Let the marked price of camera be Rs. x .

According to the question,

$(100 - 10)\%$ of $x = 120\%$ of 600

$\Rightarrow x \times 90 = 600 \times 120$

$$\Rightarrow x = \frac{600 \times 120}{90} = \text{Rs. } 800$$

- 66.** (3) Discount

= Rs. $(30000 - 28000)$

= Rs. 2000

If the rate of discount be $x\%$, then

$$30000 \times \frac{x}{100} = 2000$$

$$\Rightarrow 300x = 2000$$

$$\Rightarrow x = \frac{2000}{300} = \frac{20}{3} = 6\frac{2}{3}\%$$

- 67.** (4) Let the original price of item be Rs. 100.

C.P. for Peter = Rs. 80

$$\text{S.P. for Peter} = \text{Rs. } \left(\frac{80 \times 140}{100} \right)$$

= Rs. 112

∴ Required per cent

$$= \frac{(112 - 100) \times 100}{100} = 12\%$$

DISCOUNT

TYPE-V

1. (4) Check through options

$$15\% \text{ of } 80 = \frac{80 \times 15}{100} = 12$$

$$\text{and } 20\% \text{ of } 60 = \frac{60 \times 20}{100} = ₹ 12$$

Therefore, 15% of 80 and 20% of 60 are same. Hence the cost prices should be ₹ 80 and ₹ 60.

2. (3) Let the salesman's total sales be ₹ (10000 + x)

According to the question,

$$10000 \times \frac{11}{2}\% + x \times 6\% = 1990$$

$$\Rightarrow 5000 \times 11\% + 6x\% = 1990$$

$$\Rightarrow 5000 \times 11 + 6x = 199000$$

$$\Rightarrow 6x = 199000 - 55000$$

$$\Rightarrow 6x = 144000$$

$$\Rightarrow x = \frac{144000}{6} = 24000$$

∴ The required sales

$$= 24000 + 10000 = ₹ 34,000$$

3. (2) The housewife spends ₹ 25 and saves ₹ 2.50.

i.e., She pays ₹ 25 for a dress of ₹ 27.50.

∴ % Saving

$$= \frac{2.50}{27.50} \times 100 \approx 9\% (\text{app.})$$

4. (1) Let the C.P. of total goods be ₹ 100.

∴ Marked price = ₹ 120

$$\text{S.P. of } \frac{1}{2} \text{ stock} = ₹ 60$$

$$\text{Gain} = ₹ 10$$

$$\text{S.P. of } \frac{1}{4} \text{ stock}$$

$$= (80\% \text{ of } 120) \times \frac{1}{4} = ₹ 24$$

$$\therefore \text{Loss} = ₹ (25 - 24) = ₹ 1$$

$$\text{S.P. of remaining } \frac{1}{4} \text{ stock}$$

$$= (60\% \text{ of } 120) \times \frac{1}{4} = ₹ 18$$

$$\therefore \text{Loss} = ₹ (25 - 18) = ₹ 7$$

$$\therefore \text{Gain} = 10 - 1 - 7$$

$$= ₹ 2 \text{ i.e., } 2\%$$

5. (1) After a discount of 20%,
Listed price = 80% of ₹1500

$$= ₹ \left(1500 \times \frac{80}{100} \right) = ₹ 1200$$

Difference

$$= ₹ (1200 - 1104) = ₹ 96$$

$$\text{Let } x\% \text{ of } 1200 = 96$$

$$\Rightarrow x = \frac{96 \times 100}{1200} = 8$$

∴ Second discount = 8%

6. (4) Let the marked price of the radio be x.

According to the question,

$$x \times \frac{80}{100} \times \frac{88}{100} = 704$$

$$\therefore x = \frac{704 \times 100 \times 100}{80 \times 88} = ₹ 1000$$

7. (2) Using Rule 5,
Equivalent discount

$$= \left(20 + 5 - \frac{20 \times 5}{100} \right) \% = 24\%$$

∴ CP of article

$$= ₹ \left(25000 \times \frac{76}{100} \right) = ₹ 19000$$

Repairs cost = ₹ 1000

$$\therefore \text{Actual CP} = 19000 + 1000$$

$$= ₹ 20000$$

$$\text{SP} = ₹ 25000$$

$$\text{Profit} = 25000 - 20000 = ₹ 5000$$

∴ Gain%

$$= \frac{5000}{20000} \times 100 = 25\%$$

8. (3) Let the marked price of shirt be x and that of trousers be 2x.
Let the discount on the trousers be y%. Then,

$$x \times \frac{40}{100} + 2x \times \frac{y}{100} = 3x \times \frac{30}{100}$$

$$\Rightarrow 40x + 2xy = 90x$$

$$\Rightarrow 2y = 90 - 40$$

$$\Rightarrow y = \frac{50}{2} = 25\%$$

9. (3) Let the marked price of the grinder be ₹100

SP after a discount of 15%

$$= ₹ 85$$

$$\text{SP to gain } 15\% = \frac{85 \times 115}{100}$$

$$= ₹ 97.75$$

If ₹ 97.75 is the SP, the marked price = ₹ 100

∴ If ₹ 1955 is the SP, the marked

$$\text{price} = \frac{100}{97.75} \times 1955 = ₹ 2000$$

Amount of discount received by the retailer = 15% of 2000

$$= \frac{2000 \times 15}{100} = ₹ 300$$

10. (1) SP of 12 pairs of socks = 90% of 80

$$= \frac{80 \times 90}{100} = \text{Rs. } 72 = ₹ 72$$

∴ Number of pairs bought for ₹

$$24 = \frac{12 \times 24}{72} = 4$$

11. (3) Let the amount of the bill be x.

$$\therefore \frac{4x}{100} = 13$$

$$\Rightarrow x = \frac{1300}{4} = ₹ 325$$

12. (2) True discount

$$= \frac{\text{Amount} \times R \times T}{100 + (R \times T)}$$

$$\Rightarrow 15 = \frac{A \times 5 \times 2}{100 + 10}$$

$$\Rightarrow A = 11 \times 15 = ₹ 165$$

13. (3) Let the S.P. be x (without tax).

$$\therefore x + x \times \frac{10}{100} = 500$$

$$\Rightarrow \frac{11x}{10} = 500 \Rightarrow x = ₹ \frac{5000}{11}$$

$$\therefore \text{Discount} = 500 - \frac{5000}{11}$$

$$= \frac{500}{11}$$

Discount per cent

$$= \frac{500}{11 \times 500} \times 100$$

$$= \frac{100}{11} \% \text{ or } 9\frac{1}{11} \%$$

14. (4) Using Rule 5,

Let the original S.P. of sugar be x per kg.

S.P. after discount

$$= ₹ \frac{95x}{100} \text{ per kg}$$

DISCOUNT

$$= ₹ \frac{19x}{20} \text{ per kg}$$

$$\therefore \frac{608}{\frac{19x}{20}} - \frac{608}{x} = 2$$

$$\Rightarrow 608 \left(\frac{20}{19x} - \frac{1}{x} \right) = 2$$

$$\Rightarrow \frac{608}{19x} = 2 \Rightarrow x = \frac{608}{19 \times 2} = ₹ 16$$

15. (3) Single equivalent discount

$$= \left(50 + 40 - \frac{50 \times 40}{100} \right) \%$$

$$= 70\%$$

$$\therefore \text{Required price of shirt} = 30\% \text{ of } x$$

16. (4) Total actual C.P.

$$= ₹ (500 \times 10 + 2000) = ₹ 7000$$

$$\text{Total S.P.}$$

$$= ₹ (5 \times 750 + 5 \times 550)$$

$$= ₹ (3750 + 2750) = ₹ 6500$$

$$\text{Loss} = 7000 - 6500 = ₹ 500$$

$$\text{Loss percent}$$

$$= \frac{500}{7000} \times 100 = \frac{50}{7} = 7\frac{1}{7}\%$$

17. (3) Marked price of the fan

$$= ₹ 1400$$

$$\text{SP after allowing a discount of } 10\% = 90\% \text{ of } 1400$$

$$= \frac{1400 \times 90}{100} = ₹ 1260$$

$$\text{Second discount}$$

$$= ₹ (1260 - 1200) = ₹ 60$$

$$\text{Let the second discount be } x\%.$$

$$\therefore x\% \text{ of } 1260 = 60$$

$$\Rightarrow x = \frac{60 \times 100}{1260} = \frac{100}{21} = 4\frac{16}{21}\%$$

18. (4) True discount

$$= \frac{\text{Banker's discount} \times 100}{100 + \text{Rate} \times \text{Time}}$$

$$= \frac{216 \times 100}{100 + 16 \times \frac{6}{12}}$$

$$= \frac{216 \times 100}{108} = ₹ 200$$

19. (4) Marked price of tape recorder

$$= \frac{1500 \times 120}{100} = ₹ 1800$$

$$\text{Gain} = \frac{1500 \times 8}{100} = ₹ 120$$

$$\text{Discount} = 1800 - (1500 + 120)$$

$$= ₹ 180$$

$$\text{Let Discount per cent} = x\%, \text{ then}$$

$$\frac{1800 \times x}{100} = 180 \Rightarrow x = 10\%$$

Method 2 :

Quicker Method

$$\text{If the discount be } x\%, \text{ then}$$

$$20 - x - \frac{20x}{100} = 8$$

$$\Rightarrow 20 - \frac{6x}{5} = 8$$

$$\Rightarrow \frac{6x}{5} = 20 - 8 = 12$$

$$\Rightarrow x = \frac{12 \times 5}{6} = 10\%$$

20. (3) Required S.P.

$$= 250 \times \frac{90}{100} \times \frac{88}{100} = ₹ 198$$

21. (1) Sum

$$= \frac{\text{S.I.} \times \text{True discount}}{\text{S.I.} - \text{True discount}}$$

$$= \frac{22 \times 20}{22 - 20} = ₹ 220$$

22. (2) Price after discount of 10%

$$= \frac{1500 \times 90}{100} = ₹ 1350$$

$$\text{Second discount}$$

$$= 1350 - 1242 = ₹ 108$$

$$\text{If the rate of second discount be } x\% \text{ then,}$$

$$\frac{1350 \times x}{100} = 108$$

$$\Rightarrow x = \frac{108 \times 100}{1350} = 8\%$$

23. (2) Let original price of rice

$$= x / \text{kg}$$

$$\text{New price} = \frac{4x}{5} \text{ per kg}$$

$$\therefore \frac{800}{\frac{4x}{5}} - \frac{800}{x} = 12.5$$

$$\Rightarrow 800 \left(\frac{5}{4x} - \frac{1}{x} \right) = 12.5$$

$$\Rightarrow 800 \left(\frac{5 - 4}{4x} \right) = 12.5$$

$$\Rightarrow \frac{800}{4x} = 12.5$$

$$\Rightarrow x = \frac{200}{12.5} = ₹ 16/\text{kg}.$$

24. (2) Original price of article be x/kg .

$$\text{New price} = \frac{9x}{10} / \text{kg}.$$

$$\therefore \frac{225}{\frac{9x}{10}} - \frac{225}{x} = 25$$

$$\Rightarrow \frac{225 \times 10}{9x} - \frac{225}{x} = 25$$

$$\Rightarrow \frac{250}{x} - \frac{225}{x} = 25$$

$$\Rightarrow \frac{25}{x} = 25 \Rightarrow x = ₹ 1/\text{kg}.$$

25. (1) Let the marked price be x and cost price be ₹ 100, then

$$\frac{x \times 75}{100} = 125$$

$$\Rightarrow x = \frac{125 \times 100}{75} = ₹ \frac{500}{3}$$

$$\text{S.P. after a discount of } 10\%$$

$$= \frac{500}{3} \times \frac{90}{100} = ₹ 150$$

$$\therefore \text{Gain per cent} = 50\%$$

Aliter : Using Rule 6,

$$\text{Here, } r = 25\%, D = 25\%.$$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + 25}{100 - 25}$$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{125}{75} = \frac{5}{3}$$

$$\text{Now, } D = 10\%$$

$$\text{Profit} = ?$$

$$\frac{\text{M.P.}}{\text{C.P.}} = \frac{100 + r}{100 - D}$$

$$\frac{5}{3} = \frac{100 + r}{100 - 10}$$

$$100 + r = \frac{5}{3} \times 90$$

$$r = 150 - 100$$

$$r = 50\%$$

DISCOUNT

- 26.** (1) Single equivalent discount for successive discounts of 8% and 8%

$$= \left(8 + 8 - \frac{8 \times 8}{100} \right) \%$$

$$= (16 - 0.64) \%$$

$$\therefore \text{Difference} = 0.64 \%$$

$$\therefore \text{Loss} = 400 \times 0.64 \%$$

Amount he will lose

$$= \frac{400 \times 64}{100 \times 100} = ₹ 2.56$$

- 27.** (4) If the rate of discount be $x\%$, then

$$\frac{60 \times x}{100} = 60 - 45 = 15$$

$$\Rightarrow x = \frac{15 \times 100}{60} = 25 \%$$

Aliter : Using Rule 1.

$$\text{M.P.} = ₹ 60$$

$$\text{S.P.} = ₹ 45$$

$$\text{Discount \%} = \frac{\text{M.P.} - \text{S.P.}}{\text{M.P.}} \times 100$$

$$\text{Discount \%} = \frac{60 - 45}{60} \times 100$$

$$= \frac{15}{60} \times 100 = 25 \%$$

- 28.** (1) Let the rate of second discount be $x \%$

After 15% discount,

$$\text{Price of pen} = \frac{85}{100} \times 12 = ₹ 10.20$$

$$\text{Now, } 10.20 - 8.16 = ₹ 2.04$$

It is second discount.

$$\therefore \frac{x}{100} \times 10.20 = 2.04$$

$$\Rightarrow 10.2x = 204$$

$$\Rightarrow x = \frac{204}{10.2} = 20 \%$$

- 29.** (3) $\therefore 20\% \equiv ₹ 25$

$$\therefore 80\% \equiv \frac{80}{20} \times 25 = ₹ 100$$

- 30.** (*) If the rate = 5% p.a.; then

Present worth

$$= \frac{\text{Amount} \times 100}{100 + (R \times T)}$$

$$= \frac{600 \times 100}{100 + (5 \times 4)} = \frac{600 \times 100}{120}$$

$$= ₹ 500$$

$$\text{Discount} = 600 - 500 = ₹ 100$$

Note : No rate is mentioned in the question.

- 31.** (3) Original number of visitors = 100

$$\text{Total revenue} = 100 \times 25$$

$$= 2500 \text{ paise}$$

$$= ₹ 25$$

Case II,

$$\text{Cost of each ticket} = \frac{25 \times 80}{100}$$

$$= 20 \text{ paise} = ₹ 0.2$$

$$\text{Total revenue} = \frac{25 \times 128}{100} = ₹ 32$$

If the number of visitors be x , then

$$x \times 0.2 = 32$$

$$\Rightarrow x = \frac{32}{0.2} = \frac{320}{2} = 160$$

$$\therefore \text{Required percentage} = 60$$

- 32.** (1) Discount = 440 - 396 = ₹ 44
If the rate of discount be $x \%$, then

$$\frac{440 \times x}{100} = 44$$

$$\Rightarrow x = \frac{44 \times 100}{440} = 10 \%$$

Aliter : Using Rule 1,

$$\text{Here, M.P.} = ₹ 440$$

$$\text{S.P.} = ₹ 396$$

$$\text{Discount \%} = \frac{\text{M.P.} - \text{S.P.}}{\text{M.P.}} \times 100 \%$$

$$= \frac{440 - 396}{440} \times 100 \%$$

$$= \frac{44}{440} \times 100 \%$$

$$= 10 \%$$

- 33.** (1) C.P. of articles = ₹ 100 (let)

Marked price of articles

$$= \frac{100 \times 130}{100} = ₹ 130$$

S.P. of half of articles

$$= \frac{130}{2} = ₹ 65$$

S.P. of one-fourth of articles at

$$15\% \text{ discount} = \frac{65}{2} \times \frac{85}{100}$$

$$= ₹ 27.625$$

S.P. of remaining articles

$$= \frac{65}{2} \times \frac{70}{100} = ₹ 22.75$$

Total S.P.

$$= ₹ (65 + 27.625 + 22.75)$$

$$= ₹ 115.375$$

$$\therefore \text{Profit \%} = 15.375\% = 15\frac{3}{8} \%$$

- 34.** (2) Sum = $\frac{\text{discount} \times 100}{\text{time} \times \text{rate}}$

$$= \frac{78 \times 100}{\frac{9}{4} \times \frac{8}{3}} = \frac{78 \times 100}{6}$$

$$= ₹ 1300$$

- 35.** (4) Marked price of article = ₹ x

$$\text{C.P. for X} = \frac{90x}{100} = ₹ \frac{9x}{10}$$

$$\text{C.P. for Y} = \frac{9x \times 110}{100} = ₹ \frac{99x}{100}$$

$$\therefore \text{Required ratio} = x : \frac{99x}{100}$$

$$= 100 : 99$$

- 36.** (4) Let C.P. of article be = ₹ x

$$\therefore \text{S.P.} = ₹ \frac{85x}{100}$$

$$\therefore \text{Required ratio} = x : \frac{85x}{100}$$

$$= 100 : 85 = 20 : 17$$

- 37.** (3) Required discount

$$= \left(50 - 20 - \frac{50 \times 20}{100} \right) \%$$

$$= 20 \%$$

Detailed Method

C.P. of article = Rs. 100

Marked price = Rs. 150

$$\text{S.P.} = \frac{150 \times 80}{100} = \text{Rs. } 120$$

Gain per cent = 20%

DISCOUNT

- 38.** (3) Marked price of sewing machine = Rs. x

C.P. for the retailer

$$= \frac{1955 \times 100}{115}$$

$$= \text{Rs. } 1700$$

$$\therefore x \times \frac{85}{100} = 1700$$

$$\Rightarrow x = \frac{1700 \times 100}{85} = \text{Rs. } 2000$$

$$\therefore \text{Discount} = 2000 - 1700$$

$$= \text{Rs. } 300$$

- 39.** (3) Marked price = Rs. x and cost price = Rs. y (let)

According to question,

$$\frac{x \times 90}{100} = \frac{y \times 115}{100}$$

$$\Rightarrow \frac{x}{y} = \frac{115}{90} = \frac{23}{18} = 23 : 18$$

- 40.** (2) Price of motor cycle = Rs. a (let)

For Mr. x

C.P. of motor cycle

$$= \text{Rs. } \left(\frac{90a}{100} \times \frac{108.5}{100} \right)$$

For Mr. y

C.P. of motor cycle

$$= \text{Rs. } \left(\frac{108.5a}{100} \times \frac{90}{100} \right)$$

- 41.** (4) Percentage decrease

$$= \left(x + y + \frac{xy}{100} \right) \%$$

$$= \left(-20 - 10 + \frac{20 \times 10}{100} \right) \%$$

$$= -28\%$$

Aliter : Using Rule 5,

Here, $D_1 = 20\%$

$$D_2 = 10\%$$

Net reduction

$$= \left(D_1 + D_2 - \frac{D_1 D_2}{100} \right) \%$$

$$= \left(20 + 10 - \frac{20 \times 10}{100} \right) \%$$

$$= (30 - 2)\% = 28\%$$

- 42.** (1) C.P. of 25 windows

$$= \frac{120000 \times 75}{100} = \text{Rs. } 90,000$$

After additional discount,

C.P. for builder

$$= \text{Rs. } (90000 - 7500)$$

$$= \text{Rs. } 82500$$

\therefore Cost of each window

$$= \frac{82500}{25} = \text{Rs. } 3300$$

- 43.** (2) Total marked price of three books = Rs. 300

Their S.P. = Rs. 244.50

Discount = Rs. (300 - 244.50)

$$= \text{Rs. } 25.50$$

If the rate of discount be $x\%$, then

$$\frac{300 \times x}{100} = 25.50$$

$$\Rightarrow 300x = 25.50 \times 100$$

$$\Rightarrow x = \frac{25.50 \times 100}{300} = 8.5\%$$

Aliter : Using Rule 1,

M.P. = Rs. 300 (for three books)

S.P. = Rs. 244.50

Discount%

$$= \left(\frac{\text{M.P.} - \text{S.P.}}{\text{M.P.}} \right) \times 100\%$$

$$= \left(\frac{300 - 244.50}{300} \right) \times 100\%$$

$$= \frac{25.50}{300} \times 100$$

$$= 8.5\%$$

- 44.** (3) Using Rule 5,

Single equivalent discount =

$$\left(10 + 20 - \frac{10 \times 20}{100} \right) \%$$

$$= (30 - 2)\% = 28\%$$

\therefore C.P. of article = 100 - 28

$$= \text{Rs. } 72$$

Actual cost price of article

$$= \frac{72 \times 110}{100} = \text{Rs. } 79.2$$

\therefore For a profit of 15%,

$$\text{Required S.P.} = \frac{79.2 \times 115}{100}$$

$$= \text{Rs. } 91.08$$

- 45.** (1) Using Rule 5,

Required single discount

$$= \left(x + y - \frac{xy}{100} \right) \%$$

$$= \left(20 + 15 - \frac{20 \times 15}{100} \right) \%$$

$$= (35 - 3)\% = 32\%$$

- 46.** (3) Let 5 kg of mixture be prepared.

\therefore C.P. of 5 kg of mixture

$$= \text{Rs. } (2 \times 35 + 3 \times 40)$$

$$= \text{Rs. } (70 + 120)$$

$$= \text{Rs. } 190$$

Total S.P. of this mixture

$$= \text{Rs. } (46 + 4 \times 55)$$

$$= \text{Rs. } (46 + 220) = \text{Rs. } 266$$

\therefore Profit per cent

$$= \left(\frac{266 - 190}{190} \right) \times 100$$

$$= \frac{7600}{190} = 40\% = 1$$

- 47.** (2) Required time

$$= \frac{60 \times 100}{1800 \times 5} = \frac{2}{3} \text{ year}$$

$$= \left(\frac{2}{3} \times 12 \right) \text{ months}$$

$$= 8 \text{ months}$$

- 48.** (3) Let the amount of actual bill be Rs. x .

According to the question,

$$\frac{x \times 15}{100} = 54$$

$$\Rightarrow x = \frac{54 \times 100}{15} = \text{Rs. } 360$$

- 49.** (1) Let the marked price of building be Rs. z .

\therefore According to the question,

$$z \times (100 - x)\% = y$$

$$\Rightarrow z \times \frac{100 - x}{100} = y$$

$$\Rightarrow z = \text{Rs. } \frac{100y}{100 - x}$$

Aliter : Using Rule 2,

S.P. = Rs. y , D = $x\%$

DISCOUNT

$$\text{M.P.} = \frac{\text{SP} \times 100}{100 - D}$$

$$\text{M.P.} = \frac{y \times 100}{100 - x}$$

- 50.** (2) Profit on outlay = Rs. 6000

According to the question,

25% of outlay = Rs. 6000

$$\therefore \text{Outlay} = \frac{6000 \times 100}{25}$$

$$= \text{Rs. } 24000$$

Again, if the advertised price be Rs. x , then

$$x \times \frac{80}{100} = \text{Rs. } (24000 + 6000)$$

$$\Rightarrow x = \frac{30000 \times 100}{80}$$

$$= \text{Rs. } 37500$$

- 51.** (1) C.P. of article = Rs. x .

$$\therefore \text{Marked price} = \frac{130x}{100}$$

$$= \text{Rs. } \frac{13x}{10}$$

According to the question,

$$\frac{13x}{10} \times \frac{85}{100} = 910$$

$$\Rightarrow 13x \times 85 = 910 \times 1000$$

$$\Rightarrow x = \frac{910000}{13 \times 85} = \text{Rs. } 823.5$$

- 52.** (4) Marked price of article

$$= 80 + 40 = \text{Rs. } 120$$

If the discount be $x\%$, then

$$x\% \text{ of } 120 = \text{Rs. } 40$$

$$\Rightarrow \frac{120 \times x}{100} = 40$$

$$\Rightarrow x = \frac{40 \times 100}{120} = \frac{100}{3} = \frac{100}{3}$$

$$= 33.33\%$$

- 53.** (2) Price of T.V. set after discount

$$= 80\% \text{ of Rs. } 6000$$

$$= \text{Rs. } \left(\frac{6000 \times 80}{100} \right)$$

$$= \text{Rs. } 4800$$

S.P. of T.V. set with service con-

$$\text{tract} = \text{Rs. } \left(\frac{4800 \times 110}{100} \right)$$

$$= \text{Rs. } 5280$$

- 54.** (4) Actual price charged by A

$$= \text{Rs. } \left(\frac{20000 \times 92}{100} + \frac{16000 \times 95}{100} \right)$$

$$= \text{Rs. } (18400 + 15200)$$

$$= \text{Rs. } 33600$$

Actual price charged by B

$$= \text{Rs. } \left(\frac{36000 \times 93}{100} \right)$$

$$= \text{Rs. } 33480$$

- 55.** (2) Length of cloth bought

$$= x \text{ metre (let)}$$

$$\text{Its cost} = \text{Rs. } 32x$$

According to the question,

$$25\% \text{ of } 32x = 40$$

$$\Rightarrow 32x \times \frac{1}{4} = 40$$

$$\Rightarrow 8x = 40$$

$$\Rightarrow x = \frac{40}{8} = 5 \text{ metre}$$

- 56.** (3) Discount given

$$= \text{Rs. } (540 - 496.80)$$

$$= \text{Rs. } 43.20$$

If the rate of discount be $x\%$, then

$$x\% \text{ of } 540 = 43.20$$

$$\Rightarrow \frac{540 \times x}{100} = 43.20$$

$$\Rightarrow x = \frac{43.20 \times 100}{540} = 8\%$$

- 57.** (3) Cost of books = Rs. 1500

$$\text{Discount per cent} = 15\%$$

$$\therefore \text{Their S.P.} = 85\% \text{ of } 1500$$

$$= \text{Rs. } \left(\frac{1500 \times 85}{100} \right)$$

$$= \text{Rs. } 1275$$

- 58.** (3) Single equivalent discount for 25% and 10%

$$= \left(25 + 10 - \frac{25 \times 10}{100} \right)\%$$

$$= (35 - 2.5)\% = 32.5\%$$

$$\therefore \text{S.P. of Television}$$

$$= (100 - 32.5)\% \text{ of Rs. } 2300$$

$$= \text{Rs. } \left(\frac{2300 \times 67.5}{100} \right)$$

$$= \text{Rs. } 1552.50$$

- 59.** (3) Marked price of watch

$$= \text{Rs. } 230$$

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

$$\therefore \text{S.P. of watch} = (100 - 12)\% \text{ of Rs. } 230$$

$$= \text{Rs. } \left(\frac{230 \times 88}{100} \right)$$

$$= \text{Rs. } 202.4$$

- 60.** (2) Let the marked price of article be Rs. x .

According to the question,

$$(100 - 15)\% \text{ of } x = 318.75$$

$$\Rightarrow x \times \frac{85}{100} = 318.75$$

$$\Rightarrow x = \frac{318.75 \times 100}{85} = \text{Rs. } 375$$

- 61.** (4) After a discount of 20%,

$$\text{Price of fan} = \text{Rs. } \left(\frac{150 \times 80}{100} \right)$$

$$= \text{Rs. } 120$$

Again, discount

$$= \text{Rs. } (120 - 108) = \text{Rs. } 12$$

$$\therefore x\% \text{ of } 120 = 12$$

$$\Rightarrow x \times \frac{120}{100} = 12$$

$$\Rightarrow x = \frac{1200}{120} = 10\%$$

- 62.** (2) S.P. of washing machine

$$= (100 - 6)\% \text{ of Rs. } 7500$$

$$= \text{Rs. } \left(\frac{7500 \times 94}{100} \right)$$

$$= \text{Rs. } 7050$$

- 63.** (4) Single equivalent discount for two successive discounts of 7% each.

$$= \left(7 + 7 - \frac{7 \times 7}{100} \right)\%$$

$$= (14 - 0.49)\% = 13.51\%$$

Marked price of article

$$= \text{Rs. } 20000$$

\therefore Required S.P.

$$= (100 - 13.51)\% \text{ of Rs. } 20000$$

$$= \text{Rs. } \left(\frac{20000 \times 86.49}{100} \right)$$

$$= \text{Rs. } 17298$$

□□□

TEST YOURSELF

1. A merchant allows 5% discount on the marked price of an article to his customers. What price should he mark on an article the cost price of which is 712.50, so as to make a clear profit of

$$33\frac{1}{3}\% \text{ on his outlay ?}$$

- (1) ₹ 1000 (2) ₹ 1200
(3) ₹ 980 (4) ₹ 960

2. Sunder purchased an office bag with a price tag of ₹ 600 in a sale where 25% discount was being offered on the tag price. He was given a further discount of 10% on the amount arrived at after giving usual 25% discount. What was the final amount paid by Sunder ?

- (1) ₹ 210 (2) ₹ 540
(3) ₹ 405 (4) ₹ 450

3. A bicycle originally costs ₹ 100 and was discounted 10%. After three months, it was sold after being discounted 15%. How much was the bicycle sold for ?

- (1) ₹ 55.5 (2) ₹ 95.25
(3) ₹ 76.5 (4) None of these

4. A shopkeeper sold a TV set for ₹ 17940, with a discount of 8% and gained 19.6%. If no discount is allowed, then what will be his gain per cent ?

- (1) 25% (2) 26.4 %
(3) 24.8% (4) 30%

5. A cash payment that will settle a bill for 250 chairs at ₹ 50 per chair less 20% and 15% with a further discount of 5% on cash payment is :

- (1) ₹ 8075 (2) ₹ 7025
(3) ₹ 8500 (4) ₹ 7125

6. A shopkeeper marks the prices of his goods at 25% higher than the original price. After that, he allows a discount of 12% discount. What profit or loss did he get ?

- (1) 15% profit (2) 10% profit
(3) 10% loss (4) 15% loss

7. A shopkeepers announce the same price of ₹ 700 for a shirt. 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 is more of

- (1) ₹ 22.40 (2) ₹ 16.80
(3) ₹ 9.80 (4) ₹ 36.40

8. A tradesman gives 4% discount on the marked price and 1 article free with every 15 articles bought and still gains 35%. The marked price is more than the cost price by—

- (1) 40% (2) 39%
(3) 20% (4) 50%

9. What is the maximum percentage discount that a merchant can offer on her marked price so that she ends up selling at no profit or loss, if she had initially marked her goods up by 50% ?

- (1) 16.67% (2) 20%
(3) 50% (4) 33.33%

10. An article is listed at ₹ 65. A customer bought this article for ₹ 56.16 with two successive discounts of which one is 10%. The other discount of this discount scheme that was allowed by the shopkeeper is

- (1) 4% (2) 3%
(3) 6% (4) 2.5%

SHORT ANSWERS

1. (1)	2. (3)	3. (3)	4. (4)
5. (1)	6. (2)	7. (3)	8. (4)
9. (4)	10. (1)		

EXPLANATIONS

1. (1) Let the marked price be ₹ x .

$$\therefore \frac{95x}{100} = 712.50 \times \frac{400}{300}$$

$$\Rightarrow \frac{95x}{100} = \frac{712.5 \times 4}{3}$$

$$\Rightarrow x = \frac{712.5 \times 4 \times 100}{3 \times 95} = ₹ 1000$$

2. (3) Final amount after giving successive discounts of 25% and 10%

$$= 600 \times 0.75 \times 0.9 = ₹ 405$$

3. (3) According to question, SP of bicycle = $100 \times 0.9 \times 0.85 = ₹ 76.50$

4. (4) SP = 17940, Discount = 8%

$$\therefore \text{MP} = \frac{17940}{0.92} = ₹ 19500$$

$$\therefore \text{Gain} = 19.6\% \text{ (given)}$$

$$\therefore \text{CP} = \frac{17940}{1.196} = ₹ 15000$$

$$\text{New SP without discount} = ₹ 19500$$

$$\text{Gain} = (19500 - 15000) = ₹ 4500$$

$$\therefore \text{Gain per cent} = \frac{4500}{15000} \times 100 = 30\%$$

5. (1) By question, original price of 250 chairs

$$= 250 \times 50 = ₹ 12500$$

Price after discount

$$= 12500 \times \frac{80}{100} \times \frac{85}{100} \times \frac{95}{100} = ₹ 8075$$

6. (2) By question, Profit per cent or loss per cent.

$$= +25 - 12 - \frac{25 \times 12}{100} = +10\%$$

As the sign is +ve so, there is a profit of 10%.

7. (3) According to question, selling price of first shopkeeper.

$$= 700 \times \frac{70}{100} \times \frac{94}{100} = ₹ 460.60$$

Selling price of second shopkeeper

$$= 700 \times \frac{80}{100} \times \frac{84}{100} = ₹ 470.40$$

Required difference

$$= 470.40 - 460.60 = ₹ 9.80$$

8. (4) According to question, Discount on articles

$$\frac{1}{16} \times 100 = 6.25\%$$

Overall discount

$$= -4 - 6.25 + \frac{4 \times 6.25}{100} = -10\%$$

Let cost price = ₹ 100, then

selling price = ₹ 135

So, 90% of marked price = 135

$$\text{Marked price} = \frac{135 \times 100}{90} = ₹ 150$$

Marked price is increased by

$$= \frac{150 - 100}{100} \times 100 = 50\%$$

9. (4) Let cost price = ₹ 100

Marked price = ₹ 150

\therefore Discount per cent

$$= \frac{50}{150} \times 100 = 33.33\%$$

10. (1) Let the other discount be $x\%$.

$$65 \times \frac{90}{100} \times \frac{(100 - x)}{100} = 56.16$$

$$\Rightarrow 100 - x = \frac{56.16 \times 100 \times 100}{65 \times 90}$$

$$\Rightarrow 100 - x = 96$$

$$\Rightarrow x = 4\%$$