12 Profit and Loss

IMPORTANT FACTS AND FORMULAE

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

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

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

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

I. Gain = (S.P.) – (C.P.)

II. Loss = (C.P.) – (S.P.)

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

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

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

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

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

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

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

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

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

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

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

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

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

XIV. If a trader professes to sell his goods at a profit of x% but uses false weight which is y% less than the actual weight, then

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

XV. If a trader professes to sell his goods at a loss of x% but uses false weight which is y% less than the actual weight, then

$$\text{Gain or Loss } \% = \left\{\left(\frac{y - x}{100 - y}\right) \times 100\right\}\%$$

according as the sign is + ve or – ve.

SOLVED EXAMPLES

Ex. 1. *Mansi purchased a car for ₹ 2,50,000 and sold it for ₹ 3,48,000. What is the percent profit she made on the car?* **(Bank P.O., 2010)**

Sol. C.P. = ₹ 250000 ; S.P. = ₹ 348000.

Profit = ₹ (348000 – 250000) = ₹ 98000.

$\therefore$ Profit % = $\left(\frac{98000}{250000}\times 100\right)\% = 39.2\%$.

Ex. 2. *If C.P. is ₹ 2516 and S.P. is ₹ 2272, find the percentage loss.* **(R.R.B., 2006)**

Sol. C.P. = ₹ 2516, S.P. = ₹ 2272. Loss = ₹ (2516 – 2272) = ₹ 244.

$\therefore$ Loss% = $\left(\frac{244}{2516}\times 100\right)\% = 9.69\%$.

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

(i) C.P. = ₹ 56.25, Gain = 20% ***(ii) C.P. = ₹ 80.40, Loss = 15%***

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

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

Ex. 4. A *gold bracelet is sold for ₹ 14500 at a loss of 20%. What is the cost price of the gold bracelet*? **(Bank Recruitment, 2008)**

Sol. C.P. = ₹ $\left(\frac{100}{80}\times 14500\right)$ = ₹ 18125.

Ex. 5. *The owner of a cell phone charges his customer 23% more than the cost price. If a customer paid ₹ 7011 for a cell phone, then what was the cost price of the cell phone?* **(Bank Recruitment, 2008)**

Sol. C.P. = ₹ $\left(\frac{100}{123}\times 7011\right)$ = ₹ 5700.

Ex. 6. *Shaloo sold a mobile phone at the cost of ₹ 1950 at a loss of 25%. At what cost will she have to sell it to get a profit of 30%?* **(Bank Recruitment, 2010)**

Sol. Case I. S.P. = 1950, Loss = 25%.

$\therefore$ C.P. = ₹ $\left(\frac{100}{75}\times 1950\right)$ = ₹ 2600.

Case II. C.P. = ₹ 2600, Profit = 30%.

$\therefore$ S.P. = ₹ $\left(\frac{130}{100}\times 2600\right)$ = ₹ 3380.

Another Method:

Let the new S.P. be ₹ x. Then,

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

$\Rightarrow$ (100 – 25) : 1950 = (100 + 30) : x

$\Rightarrow$ 75 : 1950 = 130 : $x \Rightarrow x = \left(\frac{1950\times 130}{75}\right)$ = 3380.

Ex. 7. *A television manufacturer earns 20% profit by selling each T.V. set for ₹ 14400. If the production cost is increased by 15%, what should be the new selling price of a set so as to gain 15%?* **(S.S.C., 2006)**

Sol. S.P. = ₹ 14400, Profit = 20%.

$\therefore$ C.P. = ₹ $\left(\frac{100}{120}\times 14400\right)$ = ₹ 12000.

New C.P. = ₹ $\left(\frac{115}{100}\times 12000\right)$ = ₹ 13800 ; Gain = 15%.

$\therefore$ Required S.P. = ₹ $\left(\frac{115}{100}\times 13800\right)$ = ₹ 15870.

Ex. 8. ***A book was sold for ₹ 27.50 with a profit of 10%. If it were sold for ₹ 25.75, then what would have been the percentage of profit or loss?***

Sol. S.P. = ₹ 27.50, Profit = 10%.

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

When S.P. = ₹ 25.75, profit = ₹ (25.75 – 25) = ₹ 0.75.

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

Ex. 9. ***If the cost price is 96% of the selling price, then what is the profit percent?***

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

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

Ex. 10. ***A manufacturer makes 800 articles at a cost of ₹ 1.50 per article. He fixes the selling price such that if only 600 articles are sold, he would make a profit of 30% on his outlay. However, he sold 620 articles at this price. Find his actual profit percent of the total outlay, assuming that the unsold articles are useless.***

(P.C.S., 2006)

Sol. C.P. of 800 articles = ₹ (1.50 × 800) = ₹ 1200.

S.P. of 600 articles = ₹ $\left(\frac{130}{100}\times 1200\right)$ = ₹ 1560.

S.P. of 620 articles = ₹ $\left(\frac{1560}{600}\times 620\right)$ = ₹ 1612.

Profit = ₹ (1612 – 1200) = ₹ 412.

$\therefore$ Profit % = $\left(\frac{412}{1200}\times 100\right)$ % = $34\frac{1}{3}$%.

Ex. 11. ***The selling price of 30 items is equal to the purchase price of 25 items. What is the profit or loss percent?***

(Bank Recruitment, 2007)

Sol. Let C.P. of each article be ₹ 1.

Then, C.P. of 30 items = ₹ 30, S.P. of 30 items = ₹ 25.

Loss = ₹ (30 – 25) = ₹ 5.

$\therefore$ Loss% = $\left(\frac{5}{30}\times 100\right)\% = 16\frac{2}{3}\%$.

Ex. 12. ***By selling 33 metres of cloth, one gains the selling price of 11 metres. Find the gain percent.***

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

$\therefore$ S.P. of 22 m = C.P. of 33 m.

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

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

Ex. 13. ***A vendor bought bananas at 6 for ₹ 10 and sold them at 4 for ₹ 6. Find his gain or loss percent.***

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

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

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

Ex. 14. A ***vendor sells 10 clips for a rupee gaining thereby 40%. How many clips did he buy for a rupee?***

Sol. S.P. of 10 clips = ₹ 1, Gain = 40%. C.P. of 10 clips = ₹ $\left(\frac{100}{140}\times 1\right) = ₹\frac{5}{7}$.

For ₹ $\frac{5}{7}$, clips bought = 10. For ₹ 1, clips bought = $\left(10\times\frac{7}{5}\right) = 14$.

Ex. 15. ***A vendor bought buttons at 6 for a rupee. How many for a rupee must he sell to gain 20%?***

Sol. C.P. of 6 buttons = ₹ 1, Gain = 20%. S.P. of 6 buttons = ₹ $\left(\frac{120}{100}\times 1\right) = ₹\ \frac{6}{5}$.

For ₹ $\frac{6}{5}$, buttons sold = 6. For ₹ 1, buttons sold = $\left(6\times\frac{5}{6}\right) = 5$.

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

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

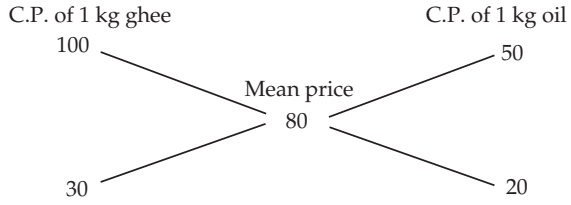
S.P. = 116% of ₹ 3000 = ₹ $\left(\frac{116}{100}\times 3000\right) = ₹\ 3480$.

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

Ex. 17. ***Pure ghee costs ₹ 100 per kg. After adulterating it with vegetable oil costing ₹ 50 per kg, a shopkeeper sells the mixture at the rate of ₹ 96 per kg, thereby making a profit of 20%. In what ratio does he mix the two?***

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

By the rule of alligation:



∴ Required ratio = 30 : 20 = 3 : 2.

Ex. 18. ***A dishonest dealer professes to sell his goods at cost price but uses a weight of 960 gms for a kg. weight. Find his gain percent.***

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

Ex. 19. ***A shopkeeper advertises for selling cloth at 4% loss. However, by using a false metre scale he actually gains 25%. What is the actual length of the scale?*** **(R.R.B., 2008)**

Sol. Let C.P. of 1 m of cloth be ₹ 1.

Professed S.P. of 1 m cloth = ₹ $\left(\frac{96}{100}\right)$ = ₹ 0.96. Gain = 25%.

Actual C.P. of the cloth sold for ₹ 0.96 = ₹ $\left(\frac{100}{125}\times 0.96\right)$ = ₹ 0.768.

Actual length of the scale = Length bought for ₹ 0.768 = 76.8 cm.

Ex. 20. ***A dishonest dealer sells the goods at $6\frac{1}{4}\%$ loss on cost price but uses $12\frac{1}{2}\%$ less weight. What is his percentage profit or loss?***

Sol. Let the C.P. of 1 kg goods be ₹ 1.

Then, S.P. of $\left[\left(100 - 12\frac{1}{2}\right)\%\text{ of }1\text{ kg}\right]$ *i.e.*, 875 g goods = ₹ 0.9375.

S.P. of 1 kg goods = ₹ $\left(\frac{0.9375}{875}\times 1000\right)$ = ₹ $1\frac{1}{14}$.

∴ Profit % = $\left(\frac{1}{14}\times 100\right)\% = 7\frac{1}{7}\%$.

Ex. 21. ***If the manufacturer gains 10%, the wholesale dealer 15% and the retailer 25%, then find the cost of production of a table, the retail price of which is ₹ 1265?*** **(G.B.O., 2007)**

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

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

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

Ex. 22. ***Monika purchased a pressure cooker at $\frac{9}{10}$th of its selling price and sold it at 8% more than its S.P. Find her gain percent.***

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

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

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

Ex. 23. ***An article is sold at a certain price. By selling it at $\frac{2}{3}$ of that price one loses 10%. Find the gain percent at original price.***

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

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

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

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

Ex. 24. ***A tradesman sold an article at a loss of 20%. If the selling price had been increased by ₹ 100, there would have been a gain of 5%. What was the cost price of the article?*** **(S.S.C., 2004)**

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

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

So, C.P. = ₹ 400.

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

Sol. Let the C.P. be ₹ x.

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

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

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

Hence, C.P. = ₹ 50.

Ex. 26. ***The price of a jewel, passing through three hands, rises on the whole by 65%. If the first and the second sellers earned 20% and 25% profit respectively, find the percentage profit earned by the third seller.***

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

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

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

Ex. 27. ***A man sold two flats for ₹ 6,75,958 each. On one he gains 16% while on the other he loses 16%. How much does he gain or lose in the whole transaction?***

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

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

Ex. 28. ***Two-thirds of a consignment was sold at a profit of 5% and the remainder at a loss of 2%. If the total profit was ₹ 400, find the value of the consignment.*** **(M.A.T., 2009)**

Sol. Let the value of the consignment be ₹ x.

C.P. of $\frac{2}{3}$rd $= ₹\ \frac{2x}{3}$; C.P. of $\frac{1}{3}$rd $= ₹\ \frac{x}{3}$.

Total S.P. $= ₹\ \left[\left(105\% \text{ of } \frac{2x}{3}\right) + \left(98\% \text{ of } \frac{x}{3}\right)\right] = ₹\ \left(\frac{7x}{10} + \frac{49x}{150}\right) = ₹\left(\frac{154x}{150}\right) = ₹\left(\frac{77x}{75}\right)$.

Gain $= ₹\ \left(\frac{77x}{75} - x\right) = ₹\ \frac{2x}{75}$.

$$\therefore \quad \frac{2x}{75} = 400 \Rightarrow x = \left(\frac{400 \times 75}{2}\right) = 15000.$$

Hence, value of the consignment = ₹ 15000.

Ex. 29. ***A man bought a horse and a carriage for ₹ 3000. He sold the horse at a gain of 20% and the carriage at a loss of 10%, thereby gaining 2% on the whole. Find the cost of the horse.***

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

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

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

Hence, C.P. of the horse = ₹ 1200.

Ex. 30. ***Find the single discount equivalent to a series discount of 10%, 20% and 30%.*** **(S.S.C., 2010)**

Sol. Let marked price be ₹ 100.

Then, Net S.P. = (100 – 30)% of (100 – 20)% of (100 – 10)% of ₹ 100

= 70% of 80% of 90% of ₹ 100

$$= ₹\ \left(\frac{70}{100} \times \frac{80}{100} \times \frac{90}{100} \times 100\right) = ₹\ 50.40.$$

$\therefore$ Required discount = (100 – 50.40)% = 49.6%.

Ex. 31. ***After getting two successive discounts, a shirt with a list price of ₹ 150 is available at ₹ 105. If the second discount is 12.5%, find the first discount.***

Sol. Let the first discount be x%.

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

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

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

$\therefore$ First discount = 20%.

Ex. 32. ***An uneducated retailer marks all his goods at 50% above the cost price and thinking that he will still make 25% profit, offers a discount of 25% on the marked price. What is his actual profit on the sales?***

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

S.P. = 75% of ₹ 150 = ₹ 112.50.

$\therefore$ Gain% = 12.50%.

Ex. 33. ***A retailer buys 40 pens at the marked price of 36 pens from a wholesaler. If he sells these pens giving a discount of 1%, what is the profit percent?***

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

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

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

Ex. 34. ***By how much above the cost should the goods be marked for sale so that after allowing a trade discount of 20% and a cash discount of $6\frac{1}{4}\%$, a net gain of 20% on the cost is made?*** **(A.A.O., 2009)**

Sol. Let C.P. = ₹ 100. Then, S.P. = ₹ 120.

Let M.P. be ₹ x.

Then, $\left(100 - 6\frac{1}{4}\right)\%$ of (100 – 20)% of x = 120

$\Rightarrow \quad 93\frac{3}{4}\%$ of 80% of x = 120

$\Rightarrow \quad \left(\frac{375}{4} \times \frac{1}{100} \times \frac{80}{100} x\right) = 120 \Rightarrow \frac{3}{4}x = 120 \Rightarrow x = \left(\frac{120 \times 4}{3}\right) = 160.$

$\therefore$ Marked price = 60% above C.P.

Ex. 35. ***When a producer allows 36% commission on the retail price of his product, he earns a profit of 8.8%. What would be his profit percent if the commission is reduced by 24%?***

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

$\therefore$ S.P. = ₹ (100 – 36) = ₹ 64. But, profit = 8.8%.

$\therefore$ C.P. $= ₹\left(\frac{100}{108.8} \times 64\right) = ₹\frac{1000}{17}.$

New commission = ₹ 12. New S.P. = ₹ (100 – 12) = ₹ 88.

$$\text{Gain} = ₹\left(88 - \frac{1000}{17}\right) = ₹\frac{496}{17}.$$

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

EXERCISE

(OBJECTIVE TYPE QUESTIONS)

Directions: ***Mark*** **(3)** ***against the correct answer:***

1. Mr Kashyap purchased an airconditioner for ₹ 12000 and sold it for ₹ 15000. What was the profit percentage? **(Bank Recruitment, 2010)**

(*a*) 15 (*b*) 20
(*c*) 25 (*d*) 35
(*e*) None of these

2. In terms of percentage profit, which is the best transaction?

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

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

(*a*) ₹ 400 (*b*) ₹ 600
(*c*) Cannot be determined (*d*) None of these

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

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

5. The cost price of an article is ₹ 7840. What should be the selling price of the article so that there is a profit of 7%? **(R.R.B., 2008)**

(*a*) ₹ 8000 (*b*) ₹ 8300
(*c*) ₹ 8388.80 (*d*) ₹ 8500.50

6. Rakesh purchased a mobile phone for ₹ 5400 and a refrigerator for ₹ 9600. He sold the mobile phone at three-fourths of its cost price and the refrigerator at $1\frac{1}{3}$ of its cost price. What was the profit/loss? **(Bank Recruitment, 2010)**

(*a*) ₹ 1580 (*b*) ₹ 1750
(*c*) ₹ 1850 (*d*) ₹ 1870
(*e*) None of these

7. Rajni purchased a mobile phone and a refrigerator for ₹ 12000 and ₹ 10000 respectively. She sold the refrigerator at a loss of 12 percent and the mobile phone at a profit of 8 percent. What is her overall loss/profit? **(Bank P.O., 2010)**

(*a*) Loss of ₹ 280 (*b*) Loss of ₹ 240
(*c*) Profit of ₹ 2060 (*d*) Profit of ₹ 2160
(*e*) None of these

8. Mohanlal purchased a TV set for ₹ 12500 and spent ₹ 300 on transportation and ₹ 800 on installation. At what price should he sell it so as to earn an overall profit of 15%? **(Specialist Officers, 2009)**

(*a*) ₹ 14375 (*b*) ₹ 14560
(*c*) ₹ 15375 (*d*) ₹ 15460
(*e*) None of these

9. Harshad bought 15 pieces of DVD players @ ₹ 4500 each and sold all of them at the total price of ₹ 81000. What is the percent profit earned in the deal? **(Bank P.O., 2009)**

(*a*) $16\frac{2}{3}$ (*b*) 20
(*c*) $20\frac{1}{2}$ (*d*) 25
(*e*) None of these

10. Alfred buys an old scooter for ₹ 4700 and spends ₹ 800 on its repairs. If he sells the scooter for ₹ 5800, his gain percent is

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

11. A shopkeeper purchased 70 kg of potatoes for ₹ 420 and sold the whole lot at the rate of ₹ 6.50 per kg. What will be his gain percent? **(S.S.C., 2007)**

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

12. Sam purchased 20 dozens of toys at the rate of ₹ 375 per dozen. He sold each one of them at the rate of ₹ 33. What was his percentage profit?

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

13. 100 oranges are bought at the rate of ₹ 350 and sold at the rate of ₹ 48 per dozen. The percentage of profit or loss is **(B.Ed Entrance, 2008)**

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

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

(*a*) ₹ 472 (*b*) ₹ 476
(*c*) ₹ 528 (*d*) ₹ 532

15. By selling an article for ₹ 100, a man gains ₹ 15. Then, his gain % is **(R.R.B., 2010)**

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

16. A trader buys some goods for ₹ 150. If the overhead expenses be 12% of cost price, then at what price should it be sold to earn 10%? **(R.R.B., 2007)**

(*a*) ₹ 184.80 (*b*) ₹ 185.80
(*c*) ₹ 187.80 (*d*) ₹ 188.80

17. A man buys 10 articles for ₹ 8 and sells them at the rate of ₹ 1.25 per article. His profit is

(*a*) $19\frac{1}{2}\%$ (*b*) 20%
(*c*) 50% (*d*) $56\frac{1}{4}\%$

18. If an article is sold at 200 percent profit, then the ratio of its cost price to its selling price will be **(S.S.C., 2010)**

(*a*) 1 : 2 (*b*) 2 : 1
(*c*) 1 : 3 (*d*) 3 : 1

19. If the ratio of cost price and selling price of an article be 10 : 11, the percentage of profit is **(S.S.C., 2010)**

(*a*) 8 (*b*) 10
(*c*) 11 (*d*) 15

20. A trader sells an article and loses $12\frac{1}{2}\%$. The ratio of cost price to the selling price is **(Hotel Management, 2007)**

(*a*) 7 : 8 (*b*) 9 : 8
(*c*) 8 : 7 (*d*) 8 : 9

21. A person buys an article for ₹ p and sells it for ₹ q thereby gaining r%. The selling price in terms of cost price may be written as **(R.R.B., 2005)**

(*a*) $\frac{pr}{100}$ (*b*) $\frac{r(100+p)}{100}$
(*c*) $\frac{p(100+r)}{100}$ (*d*) $\frac{p(100-r)}{100}$

22. The owner of a furniture shop charges his customer 28% more than the cost price. If a customer paid ₹ 23680 for a dining table set, then what was the original price of the dining set? **(Bank Recruitment, 2009)**

(*a*) ₹ 15700 (*b*) ₹ 16250
(*c*) ₹ 17500 (*d*) ₹ 18500
(*e*) None of these

23. A gold bracelet is sold for ₹ 14500 at a loss of 20%. What is the cost price of the gold bracelet? **(Bank Recruitment, 2007)**

(*a*) ₹ 15225 (*b*) ₹ 16800
(*c*) ₹ 17400 (*d*) ₹ 18125
(*e*) None of these

24. A shopkeeper expects a gain of $22\frac{1}{2}\%$ on his cost price. If in a week, his sale was of ₹ 392, what was his profit?

(*a*) ₹ 18.20 (*b*) ₹ 70
(*c*) ₹ 72 (*d*) ₹ 88.25

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

(*a*) ₹ 500 (*b*) ₹ 515
(*c*) ₹ 550 (*d*) ₹ 600

26. A shopkeeper buys 144 eggs at 90 paise each. On the way 20 eggs were broken. He sold the remaining eggs at ₹ 1.20 each. The percentage gain or loss is **(R.R.B., 2006)**

(*a*) 4.8% loss (*b*) 8.5% loss
(*c*) 12.9% gain (*d*) 14.8% gain

27. Abhishek purchased 140 shirts and 250 trousers @ ₹ 450 and @ ₹ 550 respectively. What should be the overall average selling price of shirts and trousers so that 40% profit is earned? (rounded off to next integer) **(Specialist Officers', 2009)**

(*a*) ₹ 700 (*b*) ₹ 710
(*c*) ₹ 720 (*d*) ₹ 725
(*e*) None of these

28. A person purchased 10 dozen pens at the rate of ₹ 4 per dozen. On checking, he found that 20 pens were not working. In order to earn 25% profit, he should sell the remaining pens each at **(P.C.S., 2008)**

(*a*) 40 paise (*b*) 44 paise
(*c*) 50 paise (*d*) 55 paise

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

(*a*) ₹ 86 (*b*) ₹ 87.48
(*c*) ₹ 89 (*d*) ₹ 90

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

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

31. Jacob bought a scooter for a certain sum of money. He spent 10% of the cost on repairs and sold the scooter for a profit of ₹ 1100. How much did he spend on repairs if he made a profit of 20%?

(*a*) ₹ 400 (*b*) ₹ 440
(*c*) ₹ 500 (*d*) ₹ 550

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

(*a*) ₹ 12,000 (*b*) ₹ 13,000
(*c*) ₹ 14,000 (*d*) ₹ 15,000

33. Ronit and Vinit purchased a scooter for ₹ 25000 and sold the same for ₹ 26250. If at the time of purchase Ronit paid $1\frac{1}{2}$ times as much as Vinit, how much did Vinit receive out of profit? **(P.C.S., 2004)**

(*a*) ₹ 400 (*b*) ₹ 500
(*c*) ₹ 600 (*d*) ₹ 700

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

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

35. By selling a bicycle for ₹ 2850, a shopkeeper gains 14%. If the profit is reduced to 8% then the selling price will be **(S.S.C., 2010)**

(*a*) ₹ 2600 (*b*) ₹ 2700
(c) ₹ 2800 (*d*) ₹ 3000

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

(*a*) ₹ 21,000 (*b*) ₹ 22,500
(*c*) ₹ 25,300 (*d*) ₹ 25,800

37. A fruitseller sells mangoes at the rate of ₹ 9 per kg and thereby loses 20%. At what price per kg, he should have sold them to make a profit of 5%?

(*a*) ₹ 11.81 (*b*) ₹ 12
(*c*) ₹ 12.25 (*d*) ₹ 12.31

38. Raju purchased an item for ₹ 8200 and sold it at a gain of 25%. From that amount he purchased another item and sold it at a loss of 20%. What is his overall gain/loss? **(Bank Recruitment, 2010)**

(*a*) Loss of ₹ 120 (*b*) Gain of ₹ 120

(*c*) Loss of ₹ 140 (*d*) Neither loss nor gain

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

(*a*) $2\frac{1}{4}\%$ gain (*b*) 10% loss

(*c*) $12\frac{1}{2}\%$ loss (*d*) $16\frac{2}{3}\%$ loss

40. A shopkeeper sells one transistor for ₹ 840 at a gain of 20% and another for ₹ 960 at a loss of 4%. His total gain or loss percent is

(*a*) $5\frac{15}{17}\%$ loss (*b*) $5\frac{15}{17}\%$ gain

(*c*) $6\frac{2}{3}\%$ gain (*d*) None of these

41. If selling price of an article is $\frac{4}{3}$ of its cost price, the profit in the transaction is **(M.B.A., 2006)**

(*a*) $16\frac{2}{3}\%$ (*b*) $20\frac{1}{2}\%$

(*c*) $25\frac{1}{2}\%$ (*d*) $33\frac{1}{3}\%$

42. The ratio between the sale price and the cost price of an article is 7 : 5. What is the ratio between the profit and the cost price of that article?

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

(*c*) 7 : 2 (*d*) Data inadequate

(*e*) None of these

43. If an article is sold for ₹ x, there is a loss of 15%. If the same article is sold for ₹ y, there is a profit of 15%. The ratio of $(y - x)$ to $(y + x)$ is **(Hotel Mgmt, 2010)**

(*a*) 3 : 20 (*b*) 20 : 3

(*c*) 17 : 23 (*d*) 20 : 23

44. By selling an article at some price, a man gains 10%. If the article is sold at twice of the price, the gain percent will be **(R.R.B., 2006)**

(*a*) 20% (*b*) 60%

(*c*) 100% (*d*) 120%

45. If selling price is doubled, the profit triples. Find the profit percent.

(*a*) $66\frac{2}{3}$ (*b*) 100

(*c*) $105\frac{1}{3}$ (*d*) 120

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

(*a*) 25% (*b*) 36%

(*c*) 40% (*d*) 42%

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

(*a*) 250 (*b*) 240

(*c*) 60 (*d*) 40

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

(*a*) ₹ 16 (*b*) ₹ 18

(*c*) ₹ 20 (*d*) ₹ 21

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

(*a*) ₹ 281.75 (*b*) ₹ 300

(*c*) ₹ 312.50 (*d*) ₹ 350

50. 10% loss on selling price is what percent loss on the cost price?

(*a*) $9\frac{1}{11}\%$ (*b*) $9\frac{2}{11}\%$

(*c*) 10% (*d*) 11%

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

(*a*) $16\frac{2}{3}\%$ (*b*) 20%

(*c*) 25% (*d*) $33\frac{1}{3}\%$

52. In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit?

(*a*) 30% (*b*) 70%

(*c*) 100% (*d*) 250%

53. Ashok buys a car at 20% discount of the price and sells it at 20% higher price. His percentage gain is **(R.R.B., 2006)**

(*a*) 20% (*b*) 40%

(*c*) 50% (*d*) $66\frac{2}{3}\%$

54. The profit earned after selling an article for ₹ 1754 is the same as loss incurred after selling the article for ₹ 1492. What is the cost price of the article? **(Bank P.O., 2009)**

(*a*) ₹ 1523 (*b*) ₹ 1589

(*c*) ₹ 1623 (*d*) ₹ 1689

(*e*) None of these

55. The profit earned by selling an article for ₹ 832 is equal to the loss incurred when the same article is sold for ₹ 448. What should be the sale price for making 50% profit?
(*a*) ₹ 920 (*b*) ₹ 960
(*c*) ₹ 1060 (*d*) ₹ 1200
(*e*) None of these

56. The profit earned by selling an article for ₹ 900 is double the loss incurred when the same article is sold for ₹ 450. At what price should the article be sold to make 25% profit?
(*a*) ₹ 600 (*b*) ₹ 750
(*c*) ₹ 800 (*d*) Data inadequate

57. The percentage profit earned by selling an article for ₹ 1920 is equal to the percentage loss incurred by selling the same article for ₹ 1280. At what price should the article be sold to make 25% profit?
(*a*) ₹ 2000 (*b*) ₹ 2200
(*c*) ₹ 2400 (*d*) Data inadequate
(*e*) None of these

58. Profit earned by selling an article for ₹ 1060 is 20% more than the loss incurred by selling the article for ₹ 950. At what price should the article be sold to earn 20% profit?
(*a*) ₹ 980 (*b*) ₹ 1080
(*c*) ₹ 1800 (*d*) None of these

59. When an article is sold for ₹ 116, the profit percent is thrice as much as when it is sold for ₹ 92. The cost price of the article is **(S.S.C., 2005)**
(*a*) ₹ 68 (*b*) ₹ 72
(*c*) ₹ 78 (*d*) ₹ 80

60. If the cost price of 15 books is equal to the selling price of 20 books, the loss percent is **(S.S.C., 2010)**
(*a*) 16 (*b*) 20
(*c*) 24 (*d*) 25

61. If the cost price of 10 articles is equal to the selling price of 7 articles, then the gain or loss percent is **(C.P.O., 2005)**
(*a*) 35% loss (*b*) $42\frac{6}{7}\%$ loss
(*c*) $42\frac{6}{7}\%$ gain (*d*) 51% gain

62. A wholeseller buys 20 pens at the marked price of 16 pens to a retailer. The retailer in turn sells them at the marked price. Determine the gain or loss percent to the retailer.
(*a*) 20% (*b*) 23%
(*c*) 25% (*d*) 30%

63. A farmer bought 749 sheep. He sold 700 of them for the price paid for the 749 sheep. The remaining 49 sheep were sold at the same price per head as the other 700. Based on the cost, the percent gain on the entire transaction is **(M.B.A., 2010)**
(*a*) 6.5 (*b*) 6.75
(*c*) 7.0 (*d*) 7.5

64. If by selling 110 mangoes, the C.P. of 120 mangoes is realised, the gain percent is
(*a*) $9\frac{1}{11}\%$ (*b*) $9\frac{1}{9}\%$
(*c*) $10\frac{10}{11}\%$ (*d*) $11\frac{1}{9}\%$

65. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is **(M.A.T., 2004)**
(*a*) 15 (*b*) 16
(*c*) 18 (*d*) 25

66. On an order of 5 dozen boxes of a consumer product, a retailer receives an extra dozen free. This is equivalent to allowing him a discount of
(*a*) 15% (*b*) $16\frac{1}{6}\%$
(*c*) $16\frac{2}{3}\%$ (*d*) 20%

67. A man sold 18 cots for ₹ 16,800, gaining thereby the cost price of 3 cots. The cost price of a cot is
(*a*) ₹ 650 (*b*) ₹ 700
(*c*) ₹ 750 (*d*) ₹ 800

68. Mohan bought 20 dining tables for ₹ 12000 and sold them at a profit equal to the selling price of 4 dining tables. The selling price of 1 dining table is **(R.R.B., 2006)**
(*a*) ₹ 700 (*b*) ₹ 725
(*c*) ₹ 750 (*d*) ₹ 775

69. By selling 100 pencils, a shopkeeper gains the selling price of 20 pencils. His gain percent is **(S.S.C., 2007)**
(*a*) 12 (*b*) 15
(*c*) 20 (*d*) 25

70. On selling 17 balls at ₹ 720, there is a loss equal to the cost price of 5 balls. The cost price of a ball is **(S.S.C., 2004)**
(*a*) ₹ 45 (*b*) ₹ 50
(*c*) ₹ 55 (*d*) ₹ 60

71. A vendor loses the selling price of 4 oranges on selling 36 oranges. His loss percent is
(*a*) 10% (*b*) 11%
(*c*) $12\frac{1}{2}\%$ (*d*) None of these

72. A man buys 2 dozen bananas at ₹ 16 per dozen. After selling 18 bananas at the rate of ₹ 12 per dozen, the shopkeeper reduced the rate to ₹ 4 per dozen. The percent loss is
(*a*) 25.2% (*b*) 32.4%
(*c*) 36.5% (*d*) 37.5%

73. A man bought apples at the rate of 8 for ₹ 34 and sold them at the rate of 12 for ₹ 57. How many apples should be sold to earn a net profit of ₹ 45?
(*a*) 90 (*b*) 100
(*c*) 135 (*d*) 150

74. Vinod makes a profit of ₹ 110 if he sells a certain number of pencils he has at the price of ₹ 2.50 per pencil and incurs a loss of ₹ 55 if he sells the same number of pencils for ₹ 1.75 per pencil. How many pencils does Vinod have? **(Bank P.O., 2010)**
(*a*) 200 (*b*) 220
(*c*) 240 (*d*) Cannot be determined
(*e*) None of these

75. Ram bought 1600 eggs at ₹ 3.75 a dozen. He sold 900 of them at 2 for ₹ 1 and the remaining at 5 for ₹ 2. His percent gain or loss is **(R.R.B., 2006)**
(*a*) 40% (*b*) 42%
(*c*) 45% (*d*) 46%

76. A shopkeeper purchases 11 knives in ₹ 10 and sells them at the rate of 10 knives for ₹ 11. He earns a profit of **(R.R.B., 2008)**
(*a*) 11% (*b*) 15%
(*c*) 20% (*d*) 21%

77. Oranges are bought at 5 for ₹ 10 and sold at 6 for ₹ 15. The profit or loss as percentage is **(R.R.B., 2009)**
(*a*) 25% (*b*) 35%
(*c*) 40% (*d*) 50%

78. A fruit seller buys lemons at 2 for a rupee and sells them at 5 for three rupees. His profit percent is **(S.S.C., 2007)**
(*a*) 10 (*b*) 15
(*c*) 20 (*d*) 25

79. A man bought pencils at the rate of 6 for ₹ 4 and sold them at the rate of 4 for ₹ 6. His gain in the transaction is **(S.S.C., 2005)**
(*a*) 75% (*b*) 80%
(*c*) 100% (*d*) 125%

80. A man purchased a box full of pencils at the rate of 7 for ₹ 9 and sold all of them at the rate of 8 for ₹ 11. In this transaction, he gained ₹ 10. How many pencils did the box contain?
(*a*) 100 (*b*) 112
(*c*) 114 (*d*) 115

81. A man bought a number of clips at 3 for a rupee and an equal number at 2 for a rupee. At what price per dozen should he sell them to make a profit of 20%?
(*a*) ₹ 4 (*b*) ₹ 5
(*c*) ₹ 6 (*d*) ₹ 7

82. A man buys eggs at 2 for ₹ 1 and an equal number at 3 for ₹ 2 and sells the whole at 5 for ₹ 3. His gain or loss percent is
(*a*) $2\frac{2}{7}\%$ loss (*b*) $3\frac{6}{7}\%$ gain
(*c*) $3\frac{2}{7}\%$ loss (*d*) $2\frac{6}{7}\%$ gain

83. A person buys certain number of marbles at 20 per rupee and an equal number at 30 per rupee. He mixes them and sells them at 25 per rupee. His gain or loss in the transaction is **(S.S.C., 2005)**
(*a*) 2% loss (*b*) 2% gain
(*c*) 4% loss (*d*) 4% gain

84. A man bought some oranges at ₹ 10 per dozen and bought the same number of oranges at ₹ 8 per dozen. He sold these oranges at ₹ 11 per dozen and gained ₹ 120. The total number of oranges bought by him was
(*a*) 30 dozens (*b*) 40 dozens
(*c*) 50 dozens (*d*) 60 dozens

85. A person bought some articles at the rate of 5 per rupee and the same number at the rate of 4 per rupee. He mixed both the types and sold at the rate of 9 for 2 rupees. In this business he suffered a loss of ₹ 3. The total number of articles bought by him was **(C.P.O., 2006)**
(*a*) 540 (*b*) 545
(*c*) 1080 (*d*) 1090

86. A grocer purchases three qualities of lemons at different rates. The first quality was purchased at 2 for ₹ 1, the second at 3 for ₹ 2 and the third at 4 for ₹ 3. He sold all the lemons at 5 for ₹ 4. If the ratio of the number of lemons of the three qualities is 1 : 2 : 3, then what is the approximate gain or loss percentage incurred by the grocer?
(*a*) 2.65% loss (*b*) 17.56% loss
(*c*) 17.56% gain (*d*) 18.65% gain
(*e*) None of these

87. A vendor bought toffees at 6 for a rupee. How many for a rupee must he sell to gain 20%?
(*a*) 3 (*b*) 4
(*c*) 5 (*d*) 6

88. Reynolds Superink pens are bought at the rate of 8 for ₹ 100. To make a profit of 60 per cent, these must be sold at
(*a*) 5 for ₹ 100 (*b*) 6 for ₹ 100
(*c*) 9 for ₹ 200 (*d*) None of these

89. By selling 12 toffees for a rupee, a man loses 20%. How many for a rupee should he sell to get a gain of 20%?
(*a*) 5 (*b*) 8
(*c*) 10 (*d*) 15

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

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

91. By selling 90 ball pens for ₹ 160, a person loses 20%. How many ball pens should be sold for ₹ 96 so as to have a profit of 20%? **(B.B.A., 2005)**
(*a*) 24 (*b*) 36
(*c*) 39 (*d*) 42

Directions (*Questions 92 to 96*): *Read the following information carefully and answer the questions that follow :*

A train journey from P to D by an X-express has 4 classes of fares

3 tier	₹ 300	72 berths per bogie	Train has 8 bogies
AC-3 tier	₹ 898	64 berths per bogie	Train has 2 bogies
AC-2 tier	₹ 1388	45 berths per bogie	Train has 2 bogies
AC-first class	₹ 2691	26 berths per bogie	Train has 1 bogie

The distance between P and D is 1100 km. Assume that the train does not stop at any station unless otherwise indicated.

The running cost per kilometre:
AC - bogie – ₹ 25, non-AC-bogie – ₹ 10

92. What is the approximate profit for the railways if the X-expressway runs at full occupancy on a particular day?
(*a*) ₹ 2,50,000 (*b*) ₹ 2,75,000
(*c*) ₹ 3,00,000 (*d*) Cannot be determined

93. Assuming full occupancy, a bogie of which class exhibits the highest profit margin?
(*a*) 3 tier (*b*) AC-3 tier
(*c*) AC-2 tier (*d*) AC-first class

94. The highest revenue for a journey from P to D will always be generated by
(*a*) AC- 2 tier (*b*) 3 tier
(*c*) AC-3 tier (*d*) Cannot be determined

95. Assuming full occupancy in all the classes, for a journey between P and D, the profit margin (as a percentage of running costs) of the class showing the lowest profit is approximately
(*a*) 109% (*b*) 116%
(*c*) 127% (*d*) None of these

96. For Q. 92, the percentage of the total profit that comes out of AC bogie is approximately
(*a*) 50% (*b*) 60%
(*c*) 70% (*d*) 80%

97. A shopkeeper bought three varieties A, B and C of rice in different amounts at the rates of ₹ 34.50, ₹ 28.60 and ₹ 32.40 per kg respectively. In which of the following transactions will he gain maximum? **(S.B.I.P.O., 2005)**
(*a*) He bought 25 kg of rice of variety C and sold at ₹ 42 per kg and he bought 30 kg of variety A and sold at ₹ 38 per kg.
(*b*) He bought 40 kg of rice of variety B and sold at ₹ 37 per kg and he bought 20 kg of variety A and sold at ₹ 40 per kg.
(*c*) He bought 20 kg of rice of varieties A and C each and sold at ₹ 38 and ₹ 36 per kg respectively.
(*d*) He bought 30 kg of rice of variety A and sold at ₹ 37 per kg and he bought 20 kg of variety B and sold at ₹ 33 per kg.
(*e*) He bought 20 kg of rice of variety B and sold at ₹ 40 per kg and he bought 40 kg of variety C and sold at ₹ 38 per kg.

98. Nikita bought 30 kg of wheat at the rate of ₹ 9.50 per kg and 40 kg of wheat at the rate of ₹ 8.50 per kg and mixed them. She sold the mixture at the rate of ₹ 8.90 per kg. Her total profit or loss in the transaction was **(S.S.C., 2005)**
(*a*) ₹ 2 loss (*b*) ₹ 2 profit
(*c*) ₹ 7 loss (*d*) ₹ 7 profit

99. Manish purchased 25 kg of rice @ ₹ 32 per kg and 15 kg of rice @ ₹ 36 per kg. He mixed the two varieties of rice and sold it @ ₹ 40.20 per kg. What is the percent profit earned? **(Bank P.O., 2009)**
(*a*) 20 (*b*) 25
(*c*) 30 (*d*) 40
(*e*) None of these

100. One variety of sugar is sold for ₹ 3.20 per kg at a loss of 20% and another variety is sold for ₹ 6 per kg at a gain of 20%. If equal quantities of the two are mixed together and the mixture is sold at ₹ 5.40 per kg, what is the loss or gain percentage? **(R.R.B., 2005)**
(*a*) Gain 20% (*b*) Loss 20%
(*c*) No profit, no loss (*d*) None of these

101. Arun purchased 30 kg of wheat at the rate of ₹ 11.50 per kg and 20 kg of wheat at the rate of ₹ 14.25 per kg. He mixed the two and sold the mixture. Approximately what price per kg should he sell the mixture to make 30% profit? **(Bank P.O., 2011)**
(*a*) ₹ 14.80 (*b*) ₹ 15.40
(*c*) ₹ 15.60 (*d*) ₹ 16.30
(*e*) ₹ 18.20

102. Padam purchased 30 kg of rice at the rate of ₹ 17.50 per kg and another 30 kg rice at a certain rate. He mixed the two and sold the entire quantity at the rate of ₹ 18.60 per kg and made 20% overall profit. At what price per kg did he purchase the lot of another 30 kg rice? **(N.M.A.T., 2006)**

(*a*) ₹ 12.50 (*b*) ₹ 13.50
(*c*) ₹ 14.50 (*d*) ₹ 15.50
(*e*) None of these

103. A person blends two varieties of tea–one costing ₹ 160 per kg and the other costing ₹ 200 per kg in the ratio 5 : 4. He sells the blended variety at ₹ 192 per kg. His profit percent is **(C.P.O., 2007)**

(*a*) 8 (*b*) 9
(*c*) 10 (*d*) 12

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

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

105. A shopkeeper bought 30 kg of wheat at the rate of ₹ 45 per kg. He sold forty percent of the total quantity at the rate of ₹ 50 per kg. Approximately at what price per kg should he sell the remaining quantity to make 25 percent overall profit? **(Bank P.O., 2010)**

(*a*) ₹ 50 (*b*) ₹ 52
(*c*) ₹ 54 (*d*) ₹ 56
(*e*) ₹ 60

106. A dealer buys dry fruit at the rate of ₹ 100, ₹ 80 and ₹ 60 per kg. He bought them in the ratio 12 : 15 : 20 by weight. He in total gets 20% profit by selling the first two and at last he finds he has no gain no loss in selling the whole quantity which he had. What was the percentage loss he suffered for the third quantity? **(M.A.T., 2007)**

(*a*) 20% (*b*) 30%
(*c*) 40% (*d*) 50%

107. A dairyman pays ₹ 6.40 per litre of milk. He adds water and sells the mixture at ₹ 8 per litre, thereby making 37.5% profit. The proportion of water to milk received by the customers is

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

108. Five litres of water is added to a certain quantity of pure milk costing ₹ 3 per litre. If by selling the mixture at the same price as before, a profit of 20% is made, then what is the amount of pure milk in the mixture? **(M.A.T., 2006)**

(*a*) 20 litres (*b*) 25 litres
(*c*) 30 litres (*d*) 35 litres

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

(*a*) ₹ 110 (*b*) ₹ 120
(*c*) ₹ 140 (*d*) None of these

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

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

111. A milkman cheats his customer in two ways. He mixes 10% water in pure milk and increases the price of milk by 10%. He purchases 20 kg pure milk at a rate of ₹ 15 per kg. His total profit by selling it is **(Hotel Management, 2007)**

(*a*) ₹ 40 (*b*) ₹ 63
(*c*) ₹ 80 (*d*) ₹ 100

112. A dishonest dealer uses a scale of 90 cm instead of a metre scale and claims to sell at cost price. His profit is

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

113. A dealer professes to sell his goods at cost price but he uses a false weight of 950 grams for a kilogram. The gain percent of the dealer is **(R.R.B., 2008)**

(*a*) $4\frac{5}{19}\%$ (*b*) 5%
(*c*) $5\frac{5}{19}\%$ (*d*) $19\frac{1}{5}\%$

114. A fruit seller professes to sell his fruits at cost price, but still gains 25% on his outlay. What weight does he substitute for a kilogram? **(P.C.S., 2009)**

(*a*) 800 gm (*b*) 850 gm
(*c*) 890 gm (*d*) 900 gm

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

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

116. A shopkeeper cheats to the extent of 10% while buying as well as selling, by using false weights. His total gain is **(S.S.C., 2006)**

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

117. Left pan of a faulty balance weighs 100 grams more than its right pan. A shopkeeper keeps the weight measure in the left pan while buying goods but keeps it in the right pan while selling his goods. He uses only 1 kg weight measure. If he sells his goods at the listed cost price, what is his gain?
(Civil Services, 2005; Hotel Mgmt, 2007)

(*a*) $\frac{100}{11}\%$ (*b*) $\frac{200}{11}\%$

(*c*) $\frac{100}{9}\%$ (*d*) $\frac{200}{9}\%$

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

(*a*) 30% (*b*) 35%

(*c*) 37.5% (*d*) None of these

119. A dishonest dealer sells the goods at 20% loss on cost price but uses 15% less weight. What is his percentage profit or loss?

(*a*) $5\frac{11}{17}\%$ loss (*b*) $5\frac{15}{17}\%$ loss

(*c*) $5\frac{15}{17}\%$ gain (*d*) $5\frac{11}{17}\%$ gain

120. A merchant professes to lose 4% on a certain tea but he uses a weight equal to 840g instead of 1 kg. Find his real loss or gain percent.

(*a*) $14\frac{2}{7}\%$ loss (*b*) $14\frac{2}{7}\%$ gain

(*c*) $16\frac{2}{7}\%$ loss (*d*) $16\frac{2}{7}\%$ gain

121. A shopkeeper advertises for selling cloth at 4% loss. However, by using a false metre scale he actually gains 20%. What is the actual length of the scale?
(R.R.B., 2006)

(*a*) 70 cm (*b*) 75 cm

(*c*) 80 cm (*d*) 90 cm

122. Instead of a metre scale, a cloth merchant uses a 120 cm scale while buying but uses an 80 cm scale while selling the same cloth. If he offers a discount of 20% on cash payment what is his overall profit percentage?

(*a*) 15% (*b*) 20%

(*c*) 25% (*d*) 40%

123. A trader professes to sell his goods at a nominal gain percentage but actually earns $37\frac{1}{2}\%$ profit by using false weight. If for a kg he uses a weight of 800 gm, what is the nominal gain percentage at which he claims to be selling his goods?

(*a*) 8% (*b*) 10%

(*c*) 15% (*d*) 20%

124. A dry fruit merchant professes to sell 2 kg almond packs at a loss of 20%. However, he uses two false weights each of which is marked 1 kg and thus gains $6\frac{2}{3}\%$ on selling every 2 kg of almonds. If it is given that one of the weights weighs only 850 gm, then how much does the other weight weigh?

(*a*) 650 gm (*b*) 700 gm

(*c*) 725 gm (*d*) 750 gm

125. A stockist wants to make some profit by selling sugar. He contemplates about various methods. Which of the following would maximize his profit?

(*a*) Sell sugar at 10% profit

(*b*) Use 900 g of weight instead of 1 kg

(*c*) Mix 10% impurities in sugar and sell sugar at cost price

(*d*) Increase the price by 5% and reduce the weight by 5%

126. A fair price shopkeeper takes 10% profit on his goods. He lost 20% goods during theft. His loss percent is

(*a*) 8 (*b*) 10

(*c*) 11 (*d*) 12

127. Prateek sold a music system to Kartik at 20% gain and Kartik sold it to Swastik at 40% gain. If Swastik paid ₹ 10500 for the music system, what amount did Prateek pay for the same? **(Bank P.O., 2009)**

(*a*) ₹ 6250 (*b*) ₹ 7500

(*c*) ₹ 8240 (*d*) Cannot be determined

(*e*) None of these

128. A manufacturer sells an article to a wholesale dealer at a profit of 20% and the wholesale dealer sells it to a retail merchant at a loss of 5%. Find the resultant loss or profit. **(R.R.B., 2006)**

(*a*) 12% loss (*b*) 12% gain

(*c*) 14% loss (*d*) 14% gain

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

(*a*) ₹ 850 (*b*) ₹ 890

(*c*) ₹ 930 (*d*) ₹ 950

130. A car worth ₹ 1,50,000 was sold by X to Y at 5% profit. Y sold the car back to X at 2% loss. In the entire transaction **(C.P.O., 2007)**

(*a*) X gained ₹ 4350 (*b*) X lost ₹ 4350

(*c*) X gained ₹ 3150 (*d*) X lost ₹ 3150

131. A manufacturer sold a machine to a wholesale dealer at a profit of 10%. The wholesale dealer sold it to a retailer at a profit of 20%. While transporting some defect occurred in the machine and hence the retailer sold it at a loss of 5%. The customer paid ₹ 627. Find the cost of the machine for the manufacturer. **(M.A.T., 2010)**

(*a*) ₹ 500 (*b*) ₹ 534
(*c*) ₹ 600 (*d*) ₹ 672

132. Goods pass successively through the hands of three traders and each of them sells his goods at a profit of 25% of his cost price. If the last trader sold the goods for ₹ 250, then how much did the first trader pay for them? **(S.S.C., 2005)**

(*a*) ₹ 128 (*b*) ₹ 150
(*c*) ₹ 192 (*d*) ₹ 200

133. An article passing through two hands is sold at a profit of 38% at the original cost price. If the first dealer makes a profit of 20%, then the profit percent made by the second is **(C.P.O., 2006)**

(*a*) 5 (*b*) 10
(*c*) 12 (*d*) 15

134. A merchant buys an article for ₹ 27 and sells it at a profit of 10 percent of the selling price. The selling price of the article is **(C.P.O., 2005)**

(*a*) ₹ 29.70 (*b*) ₹ 30
(*c*) ₹ 32 (*d*) ₹ 37

135. By selling an article, a man makes a profit of 25% of its selling price. His profit percent is **(S.S.C., 2010)**

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

136. If there is a profit of 20% on the cost price of an article, the percentage of profit calculated on its selling price will be **(S.S.C., 2010)**

(*a*) $8\frac{1}{3}$ (*b*) $16\frac{2}{3}$
(*c*) 20 (*d*) 24

137. Vineet calculates his profit percentage on the selling price whereas Roshan calculates his profit on the cost price. They find that the difference of their profits is ₹ 275. If the selling price of both of them are the same and Vineet gets 25% profit whereas Roshan gets 15% profit, find their selling price. **(N.M.A.T., 2005)**

(*a*) ₹ 2100 (*b*) ₹ 2250
(*c*) ₹ 2300 (*d*) ₹ 2350

138. A clock was sold for ₹ 144. If the percentage of profit was numerically equal to the cost price, the cost of the clock was **(S.S.C., 2005; R.R.B., 2009; P.C.S., 2009)**

(*a*) ₹ 72 (*b*) ₹ 80
(*c*) ₹ 90 (*d*) ₹ 100

139. By selling an article at $\frac{2}{3}$ of the marked price, there is a loss of 10%. The profit percent, when the article is sold at the marked price, is **(C.P.O., 2006)**

(*a*) 20% (*b*) 30%
(*c*) 35% (*d*) 40%

140. Raghavan purchase a scooter at $\frac{13}{15}$ of its selling price and sold it at 12% more than its selling price. His gain is **(S.S.C., 2005)**

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

141. A man buys an article for 10% less than its value and sells it for 10% more than its value. His gain or loss percent is

(*a*) no profit, no loss (*b*) 20% profit
(*c*) less than 20% profit (*d*) more than 20% profit

142. Samant bought a microwave oven and paid 10% less than the original price. He sold it with 30% profit on the price he had paid. What percentage of profit did Samant earn on the original price?

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

143. If 5% more is gained by selling an article for ₹ 350 than by selling it for ₹ 340, the cost of the article is

(*a*) ₹ 50 (*b*) ₹ 160
(*c*) ₹ 200 (*d*) ₹ 225

144. If a man reduces the selling price of a fan from ₹ 400 to ₹ 380, his loss increases by 2%. The cost price of the fan is

(*a*) ₹ 480 (*b*) ₹ 500
(*c*) ₹ 600 (*d*) None of these

145. An increase of ₹ 3 in the selling price of an article turns a loss of $7\frac{1}{2}\%$ into a gain of $7\frac{1}{2}\%$. The cost price (in ₹) of the article is **(C.P.O., 2007)**

(*a*) 10 (*b*) 15
(*c*) 20 (*d*) 25

146. A shopkeeper sells an article at $12\frac{1}{2}\%$ loss. If he sells it for ₹ 92.50 more then he gains 6%. What is the cost price of the article? **(MA.T., 2008)**

(*a*) ₹ 500 (*b*) ₹ 510
(*c*) ₹ 575 (*d*) ₹ 600

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

(*a*) ₹ 850 (*b*) ₹ 925
(*c*) ₹ 1080 (*d*) ₹ 1125

148. A man sells a book at a profit of 20%. If he had bought it at 20% less and sold it for ₹ 18 less, he would have gained 25%. The cost price of the book is **(M.A.T., 2009)**

(*a*) ₹ 60 (*b*) ₹ 70
(*c*) ₹ 80 (*d*) ₹ 90

149. A bookseller sells a book at a profit of 10%. If he had bought it at 4% less and sold it for ₹ 6 more, he would have gained $18\frac{3}{4}\%$. The cost price of the book is **(S.S.C., 2007)**

(*a*) ₹ 130 (*b*) ₹ 140
(*c*) ₹ 150 (*d*) ₹ 160

150. A watch is sold at a profit of 20%. If both the cost price and the selling price of the watch are decreased by ₹ 100, the profit would be 5% more. Original cost price of the watch is **(A.A.O. Exam, 2010)**

(*a*) ₹ 450 (*b*) ₹ 500
(*c*) ₹ 550 (*d*) ₹ 600

151. An article is sold at a profit of 20%. If the cost price is increased by 10% and the sale price by ₹ 26, then the percentage of profit reduces by 5%. Determine the cost price. **(M.C.A., 2005)**

(*a*) ₹ 300 (*b*) ₹ 400
(*c*) ₹ 500 (*d*) ₹ 600

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

(*a*) ₹ 1240 (*b*) ₹ 1400
(*c*) ₹ 1600 (*d*) None of these

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

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

154. Shailja earns 15 percent on an investment but loses 10 percent on another investment. If the ratio of the two investments is 3 : 5, then the combined loss percent is **(S.S.C., 2006)**

(*a*) $\frac{5}{8}$ (*b*) $\frac{8}{5}$
(*c*) $\frac{4}{5}$ (*d*) $\frac{5}{4}$

155. A shopkeeper bought three watches w_1, w_2 and w_3 from a dealer and sold them to three different customers. The ratio of the selling prices of the watches w_1, w_2 and w_3 was 2 : 3 : 4. The shopkeeper gains 30% and 20% on the watches w_1 and w_2 respectively but loses 40% on the watch w_3. What was the shopkeeper's approximate percent gain or loss in the whole transaction?

(*a*) 16% profit (*b*) 16% loss
(*c*) 15% loss (*d*) Data inadequate

156. A man sells two articles for ₹ 240 each. On one he gains 20% and on the other he loses 20%. What is the gain or loss percent in the entire transaction? **(S.S.C., 2005)**

(*a*) 1% gain (*b*) 2% loss
(*c*) 4% gain (*d*) 4% loss

157. A shopkeeper sells two watches for ₹ 308 each. On one he gets 12% profit and on the other 12% loss. His profit or loss in the entire transaction was **(R.R.B., 2006; S.S.C., 2007)**

(*a*) Neither profit, nor loss (*b*) $1\frac{11}{25}\%$ loss
(*c*) $1\frac{11}{25}\%$ profit (*d*) $3\frac{2}{25}\%$ loss

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

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

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

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

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

(*a*) no loss, no gain (*b*) loss of ₹ $\frac{1}{12}$ lakh
(*c*) loss of ₹ $\frac{1}{18}$ lakh (*d*) gain of ₹ $\frac{1}{24}$ lakh

161. A man sells two articles at ₹ 99 each. He gains 10% on one and loses 10% on the other. Then on overall basis he **(P.C.S., 2006)**

(*a*) gains ₹ 2 (*b*) neither gains nor loses
(*c*) loses ₹ 2 (*d*) loses ₹ 1

162. A man sold two steel chairs for ₹ 500 each. On one, he gains 20% and on the other, he loses 12%. How much does he gain or lose in the whole transaction? **(M.A.T., 2006)**

(*a*) 1.5% gain (*b*) 1.5% loss
(*c*) 2% gain (*d*) 2% loss

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

(*a*) ₹ 10.04 (*b*) ₹ 10.875
(*c*) ₹ 12.80 (*d*) ₹ 12.875

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

(*a*) ₹ 7.40 (*b*) ₹ 7.60
(*c*) ₹ 7.80 (*d*) ₹ 8

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

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

166. In a shop, 80% of the articles are sold at a profit of 10% and the remaining at a loss of 40%. What is the overall profit/loss? **(Campus Recruitment, 2009)**

(*a*) 10% profit (*b*) 10% loss
(*c*) 5% loss (*d*) No profit no loss

167. If a person makes a profit of 10% on one-fourth of the quantity sold and a loss of 20% on the rest, then what is the average percent profit or loss? **(J.M.E.T., 2004)**

(*a*) 11.25% loss (*b*) 11.75% profit
(*c*) 12.5% profit (*d*) 12.5% loss

168. I purchased 120 exercise books at the rate of ₹ 3 each and sold $\frac{1}{3}$ of them at the rate of ₹ 4 each, $\frac{1}{2}$ of them at the rate of ₹ 5 each and the rest at the cost price. My profit percent is **(C.P.O., 2006)**

(*a*) 44% (*b*) $44\frac{2}{3}\%$
(*c*) $44\frac{4}{9}\%$ (*d*) 45%

169. A departmental store receives a shipment of 1000 pens, for which it pays ₹ 9000. The store sells the pens at a price 80 percent above cost for one month, after which it reduces the price of the pens to 20 percent above cost. The store sells 75 percent of the pens during the first month and 50 percent of the remaining pens afterwards. How much gross income did the sales of the pens generate?

(*a*) ₹ 10000 (*b*) ₹ 10800
(*c*) ₹ 12150 (*d*) ₹ 13500

170. If a shopkeeper sells $\frac{1}{3}$ of his goods at a profit of 14%, $\frac{3}{5}$ of the goods at a profit of 17.5% and the remaining at a profit of 20%, then his profit on the whole is equal to

(*a*) 15.5% (*b*) 16%
(*c*) 16.5% (*d*) 17%

171. A cloth merchant sold half of his cloth at 20% profit, half of the remaining at 20% loss and the rest was sold at the cost price. In the total transaction, his gain or loss will be

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

172. A person purchases 90 clocks and sells 40 clocks at a gain of 10% and 50 clocks at a gain of 20%. If he sold all of them at a uniform profit of 15%, then he would have got ₹ 40 less. The cost price of each clock is

(*a*) ₹ 50 (*b*) ₹ 60
(*c*) ₹ 80 (*d*) ₹ 90

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

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

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

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

175. A merchant has 1000 kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. He gains 14% on the whole. The quantity (in kg) sold at 18% profit is **(L.I.C.A.A.O., 2007)**

(*a*) 400 (*b*) 560
(*c*) 600 (*d*) 640

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

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

177. A man sells two horses for ₹ 1475. The cost price of the first is equal to the selling price of the second. If the first is sold at 20% loss and the second at 25% gain, what is his total gain or loss (in rupees)?
(*a*) ₹ 60 loss (*b*) ₹ 80 gain
(*c*) ₹ 60 gain (*d*) Neither gain nor loss

178. Two-thirds of a consignment was sold at a profit of 6% and the rest at a loss of 3%. If however there was an overall profit of ₹ 540, the value of consignment was **(M.B.A., 2007)**
(*a*) ₹ 15000 (*b*) ₹ 16000
(*c*) ₹ 18000 (*d*) None of these

179. A trader purchases a watch and a wall clock for ₹ 390. He sells them making a profit of 10% on the watch and 15% on the wall clock. He earns a profit of ₹ 51.50. The difference between the original prices of the wall clock and the watch is equal to **(N.M.A.T., 2005)**
(*a*) ₹ 80 (*b*) ₹ 100
(*c*) ₹ 110 (*d*) ₹ 120

180. Albert buys 4 horses and 9 cows for ₹ 13,400. If he sells the horses at 10% profit and the cows at 20% profit, then he earns a total profit of ₹ 1880. The cost of a horse is
(*a*) ₹ 1000 (*b*) ₹ 2000
(*c*) ₹ 2500 (*d*) ₹ 3000

181. A man purchases two clocks A and B at a total cost of ₹ 650. He sells A with 20% profit and B at a loss of 25% and gets the same selling price for both the clocks. What are the purchasing prices of A and B respectively?
(*a*) ₹ 225, ₹ 425 (*b*) ₹ 250, ₹ 400
(*c*) ₹ 275, ₹ 375 (*d*) ₹ 300, ₹ 350

182. A farmer sold a cow and an ox for ₹ 800 and got a profit of 20% on the cow and 25% on the ox. If he sells the cow and the ox for ₹ 820 he gets a profit of 25% on the cow and 20% on the ox. The individual cost price of the cow and the ox is **(N.M.A.T., 2005)**
(*a*) ₹ 530.60, ₹ 130.60 (approx)
(*b*) ₹ 515.60, ₹ 115.60 (approx)
(*c*) ₹ 531.50, ₹ 135.50 (approx)
(*d*) Cannot be determined

183. The C.P. of two watches taken together is ₹ 840. If by selling one at a profit of 16% and the other at a loss of 12%, there is no loss or gain in the whole transaction, then the C.P. of the two watches are respectively
(*a*) ₹ 360, ₹ 480 (*b*) ₹ 480, ₹ 360
(*c*) ₹ 380, ₹ 460 (*d*) ₹ 400, ₹ 440

184. On selling a chair at 7% loss and a table at 17% gain, a man gains ₹ 296. If he sells the chair at 7% gain and the table at 12% gain, then he gains ₹ 400. The actual price of the table is
(*a*) ₹ 1600 (*b*) ₹ 1800
(*c*) ₹ 2200 (*d*) ₹ 2400

185. A space research company wants to sell its two products A and B. If the product A is sold at 20% loss and the product B at 30% gain, the company will not lose anything. If the product A is sold at 15% loss and the product B at 15% gain, the company will lose ₹ 6 million in the deal. What is the cost of product B? **(M.B.A., 2009)**
(*a*) ₹ 80 million (*b*) ₹ 100 million
(*c*) ₹ 120 million (*d*) ₹ 140 million

186. A small and medium enterprise imports two components A and B from Taiwan and China respectively and assembles them with other components to form a toy. Component A contributes to 10% of production cost while component B contributes to 20% of production cost. Usually the company sells this toy at 20% above the production cost. Due to increase in the raw material and labour cost in both the countries, component A became 20% costlier and component B became 40% costlier. Owing to these reasons the company increased its selling price by 15%. Considering that cost of other components does not change, what will be the profit percentage if the toy is sold at the new price? **(I.I.F.T., 2010)**
(*a*) 15.5% (*b*) 25.5%
(*c*) 35.5% (*d*) 40%

187. A firm of readymade garments makes both men's and women's shirts. Its average profit is 6% of the sales. Its profit in men's shirts average 8% of the sales and women's shirts comprise 60% of the output. The average profit per sales rupee in women's shirts is **(M.A.T., 2006)**
(*a*) 0.0166 (*b*) 0.0466
(*c*) 0.0666 (*d*) None of these

188. The cost of manufacturing an article rose by 18% as a result of the increase in the cost of raw material. A manufacturer revised the selling price of the article so as to maintain the same profit percentage as before. However, he found that he now got ₹ 9 more than the earlier profit by selling each article. What was the earlier profit per article?
(*a*) ₹ 36 (*b*) ₹ 45
(*c*) ₹ 50 (*d*) ₹ 54

189. The cost of raw materials of a product increases by 30%, the manufacturing cost increases by 20% and the selling price of the product increases by 60%. The raw material and the manufacturing cost originally formed 40% and 60% of the total cost respectively. If the original profit percentage was one-fourth the original manufacturing cost, find the approximate new profit percentage.
(*a*) 48.39% (*b*) 54.76%
(*c*) 63.85% (*d*) 66.72%

190. Previously, the manufacturing cost of a product was thrice the cost of raw material. Now the cost of raw material increases in the ratio 5 : 12 and manufacturing cost increases in the ratio of 3 : 5. The previous cost of the product was ₹ 8. What should be the present selling price so that 25% profit can be made? **(Hotel Management, 2007)**

(*a*) ₹ 13.70 (*b*) ₹ 14.80

(*c*) ₹ 18.50 (*d*) ₹ 19.50

191. A milk vendor mixes water with milk in the ratio 1 : 4. He then measures 800 ml instead of a litre and sells the milk at a nominal profit of 20% over the cost price. What is his actual profit percentage?

(*a*) 37.5% (*b*) 50%

(*c*) 62.5% (*d*) 87.5%

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

(*a*) ₹ 633.25 (*b*) ₹ 633.75

(*c*) ₹ 634 (*d*) ₹ 635

193. If a company sells a car with a marked price of ₹ 2,72,000 and gives a discount of 4% on ₹ 2,00,000 and 2.5% on the remaining amount of ₹ 72,000, then the actual price charged by the company for the car is

(*a*) ₹ 2,50,000 (*b*) ₹ 2,55,000

(*c*) ₹ 2,60,100 (*d*) ₹ 2,62,200

194. Garima purchased a briefcase with an additional 10% discount on the reduced price after deducting 20% on the labelled price. If the labelled price was ₹ 1400, at what price did she purchase the briefcase?

(*a*) ₹ 980 (*b*) ₹ 1008

(*c*) ₹ 1056 (*d*) ₹ 1120

(*e*) None of these

195. A T-shirt bought for ₹ 50 is marked at 8 percent profit and then sold at a 10 percent sales discount on marked price. What is the selling price of the T-shirt?

(*a*) ₹ 48 (*b*) ₹ 50

(*c*) ₹ 52 (*d*) None of these

196. An umbrella marked at ₹ 80 is sold for ₹ 68. The rate of discount is **(P.C.S., 2008)**

(*a*) 15% (*b*) 17%

(*c*) 18.5% (*d*) 20%

197. A dress shop marked down all items as following:

Group	Regular price	Sale price
A	₹ 65	₹ 55
B	₹ 60	₹ 50
C	₹ 70	₹ 60
D	₹ 75	₹ 65

Which group of items was offered at the greatest rate of discount?

(*a*) A (*b*) B

(*c*) C (*d*) D

198. Vanita bought a watch with 25% discount on the selling price. If the watch cost her ₹ 780, what is the original selling price of the watch? **(M.A.T., 2009)**

(*a*) ₹ 950 (*b*) ₹ 1000

(*c*) ₹ 1040 (*d*) Cannot be determined

199. In a sale, perfume is available at a discount of 15% on the selling price. If the perfume's discounted selling price is ₹ 3675.40, what was the original selling price of the perfume? **(Bank P.O., 2009)**

(*a*) ₹ 4294 (*b*) ₹ 4324

(*c*) ₹ 4386 (*d*) ₹ 4400

(*e*) None of these

200. A pair of articles was bought for ₹ 37.40 at a discount of 15%. What must be the marked price of each of the articles?

(*a*) ₹ 11 (*b*) ₹ 22

(*c*) ₹ 33 (*d*) ₹ 44

201. A shopkeeper gives 12% additional discount on the discounted price, after giving an initial discount of 20% on the labelled price of a radio. If the final sale price of the radio is ₹ 704, then what is its labelled price?

(*a*) ₹ 844.80 (*b*) ₹ 929.28

(*c*) ₹ 1000 (*d*) ₹ 1044.80

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

(*a*) 8% (*b*) 10%

(*c*) 12% (*d*) 15%

203. A discount of 15% on one article is the same as a discount of 20% on another article. The costs of the two articles can be

(*a*) ₹ 40, ₹ 20 (*b*) ₹ 60, ₹ 40

(*c*) ₹ 80, ₹ 60 (*d*) ₹ 60, ₹ 40

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

(*a*) ₹ 18 (*b*) ₹ 20

(*c*) ₹ 21 (*d*) ₹ 27

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

(*a*) $\frac{100y}{100-x}$ (*b*) $\frac{100y}{1-x}$

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

206. A seller allows a discount of 5% on a watch. If he allows a discount of 7% he earns ₹ 15 less in the profit. What is the marked price? **(R.R.B., 2006)**

(*a*) ₹ 697.50 (*b*) ₹ 712.50
(*c*) ₹ 750 (*d*) ₹ 817.50

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

(*a*) ₹ 5000 (*b*) ₹ 10,000
(*c*) ₹ 12,500 (*d*) ₹ 15,000

208. A sells a scooter priced at ₹ 36000. He gives a discount of 8% on the first ₹ 20000 and 5% on the next ₹ 10000. How much discount can he afford on the remaining ₹ 6000 if he is to get as much as when 7% discount is allowed on the total?

(*a*) 5% (*b*) 6%
(*c*) 7% (*d*) 8%

209. Manoj sold an article for ₹ 15000. Had he offered a discount of 10% on the selling price he would have earned a profit of 8%. What is the cost price? **(Bank P.O., 2009)**

(*a*) ₹ 12250 (*b*) ₹ 12500
(*c*) ₹ 13250 (*d*) ₹ 13500
(*e*) None of these

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

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

211. Successive discounts of 10%, 12% and 15% amount to a single discount of **(R.R.B., 2009; S.S.C., 2008)**

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

212. A discount series of p% and q% on an invoice is the same as a single discount of **(M.B.A., 2007)**

(*a*) $\left[p+q+\frac{pq}{100}\right]\%$ (*b*) $\left[p-q+\frac{pq}{100}\right]\%$

(*c*) $100-\left[p+q+\frac{pq}{100}\right]\%$ (*d*) None of these

213. Three successive discounts of 20% on the marked price of a commodity are together equivalent to a single discount of

(*a*) 48.8% (*b*) 50.2%
(*c*) 55.8% (*d*) 60%

214. A shop gives 10% discount on the purchase of an item. If paid for in cash immediately, a further discount of 12% is given. If the original price of the item is ₹ 250, what is the price of the article if a cash purchase is made? **(R.R.B., 2006)**

(*a*) ₹ 190 (*b*) ₹ 195
(*c*) ₹ 198 (*d*) ₹ 200

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

(*a*) ₹ 70.10 (*b*) ₹ 70.20
(*c*) ₹ 72 (*d*) ₹ 72.20

216. A dealer buys an article marked at ₹ 25000 with 20% and 5% off. He spends ₹ 1000 on its repairs and sells it for ₹ 25000. What is his gain or loss percent? **(S.S.C., 2007)**

(*a*) Loss of 25% (*b*) Gain of 25%
(*c*) Loss of 10% (*d*) Gain of 10%

217. If an article with marked price of ₹ 400 is sold at successive discounts of 10%, 25% and 15%, what is the approximate price the customer has to pay? **(Campus Recruitment, 2009)**

(*a*) ₹ 230 (*b*) ₹ 270
(*c*) ₹ 300 (*d*) ₹ 360

218. For the purchase of a motor car, a man has to pay ₹ 17000 when a single discount of 15% is allowed. How much will he have to pay for it if two successive discounts of 5% and 10% respectively are allowed? **(S.S.C., 2005)**

(*a*) ₹ 17000 (*b*) ₹ 17010
(*c*) ₹ 17100 (*d*) ₹ 18000

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

(*a*) ₹ 226 (*b*) ₹ 250
(*c*) ₹ 252 (*d*) ₹ 269

220. Applied to a bill for ₹ 1,00,000, the difference between a discount of 40% and two successive discounts of 36% and 4% is

(*a*) Nil (*b*) ₹ 1440
(*c*) ₹ 2500 (*d*) ₹ 1960

221. Two stores A and B mark the price of an item identically. A allows 3 successive discounts of 10% each. B allows 10% discount on the list price and a subsequent discount of 19%. Under the circumstances, which of the following is true?

(*a*) The price of the article is cheaper at A.
(*b*) The price of the article is cheaper at B.
(*c*) The price of the article is same at A and B.
(*d*) The price cannot be determined.

222. If on a marked price, the difference of selling prices with a discount of 30% and two successive discounts of 20% and 10% is ₹ 72, then the marked price (in ₹) is **(S.S.C., 2010)**

(*a*) 2400 (*b*) 2500
(*c*) 3000 (*d*) 3600

223. An article is listed at ₹ 900 and two successive discounts of 8% and 8% are given on it. How much would the seller gain or lose, if he gives a single discount of 16%, instead of two discounts? **(S.S.C., 2007)**

(*a*) Gain of ₹ 4.76 (*b*) Loss of ₹ 5.76
(*c*) Loss of ₹ 4.76 (*d*) Gain of ₹ 5.76

224. Two shopkeepers announce the same price of ₹ 700 for a sewing machine. The first offers successive discounts of 30% and 6% while the second offers successive discounts of 20% and 16%. The shopkeeper that offers better discount, charges ..... less than the other shopkeeper. **(M.A.T., 2009)**

(*a*) ₹ 9.80 (*b*) ₹ 16.80
(*c*) ₹ 22.40 (*d*) ₹ 36.40

225. A company offers three types of successive discounts
(*i*) 25% and 15% ; (*ii*) 30% and 10% ;
(*iii*) 35% and 5%.
Which offer is the best for a customer? **(S.S.C., 2007)**

(*a*) First offer
(*b*) Second offer
(*c*) Third offer
(*d*) Any one; all are equally good

226. On a ₹ 10000 payment order, a person has choice between 3 successive discounts of 10%, 10% and 30%, and 3 successive discounts of 40%, 5% and 5%. By choosing the better one he can save (in rupees) **(L.I.C.A.A.O., 2007)**

(*a*) 200 (*b*) 255
(*c*) 400 (*d*) 433

227. A shopkeeper gives 3 consecutive discounts of 10%, 15% and 15% after which he sells his goods at a percentage profit of 30.05 percent on the cost price. Find the value of the percentage profit that the shopkeeper would have earned if he had given discounts of 10% and 15% only. **(M.B.A., 2008)**

(*a*) 53% (*b*) 62.5%
(*c*) 68.6% (*d*) 72.5%

228. A shopkeeper gives two successive discounts on an article marked ₹ 450. The first discount given is 10%. If the customer pays ₹ 344.25 for the article, the second discount given is **(S.S.C., 2006)**

(*a*) 10% (*b*) 12%
(*c*) 14% (*d*) 15%

229. The marked price of a watch was ₹ 820. A man bought the same for ₹ 570.72 after getting two successive discounts of which the first was 20%. The rate of second discount was **(S.S.C., 2008)**

(*a*) 12% (*b*) 13%
(*c*) 15% (*d*) 18%

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

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

231. A person first increases the price of a commodity by 10% and then he announces a discount of 15%. The actual discount on the original price is **(M.C.A., 2005; R.R.B., 2009)**

(*a*) 5% (*b*) 6.5%
(*c*) 7.5% (*d*) 12.5%

232. Raman bought a camera and paid 20% less than its original price. He sold it at 40% profit on the price he had paid. The percentage of profit earned by Raman on the original price was **(S.S.C., 2007)**

(*a*) 12 (*b*) 15
(*c*) 22 (*d*) 32

233. A trader marked the price of a product in such a way that it is 20% more than the cost price. If he allows 10% discount on the marked price to the customer then his gain is **(L.I.C.A.D.O., 2008; S.S.C., 2005, 06; C.P.O., 2007; Hotel Mgmt, 2007)**

(*a*) 8% (*b*) 10%
(*c*) 15% (*d*) 20%

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

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

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

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

236. A shopkeeper earns a profit of 12% on selling a book at 10% discount on the printed price. The ratio of the cost price and the printed price of the book is **(S.S.C., 2010; R.R.B., 2006)**

(*a*) 45 : 56 (*b*) 50 : 61
(*c*) 99 : 125 (*d*) None of these

237. A showroom owner sells a leather jacket for ₹ X and claims to make a profit of 10%. He plans to have a stall in the trade fair and marks the same jacket at ₹ 2X. At the stall, he allows a discount of 20%. What will be the percentage profit that he will make at the trade fair? **(M.B.A., 2006)**

(*a*) 60% (*b*) 76%
(*c*) 80% (*d*) 86%

238. The price of an article is raised by 30% and then two successive discounts of 10% each are allowed. Ultimately, the price of the article is
(*a*) decreased by 5.3% (*b*) increased by 3%
(*c*) increased by 5.3% (*d*) increased by 10%

239. A retailer buys 30 articles from a wholesaler at the price of 27. If he sells them at their marked price, the gain percent in the transaction is
(*a*) $9\frac{1}{11}\%$ (*b*) 10%
(*c*) $11\frac{1}{9}\%$ (*d*) $16\frac{2}{3}\%$

240. By selling an umbrella for ₹ 300, a shopkeeper gains 20%. During a clearance sale, the shopkeeper allows a discount of 10% on the marked price. His gain percent during the sale is
(*a*) 7 (*b*) 7.5
(*c*) 8 (*d*) 9

241. The cost price of an article is 64% of the marked price. Calculate the gain percent after allowing a discount of 12%.
(*a*) 37.5% (*b*) 48%
(*c*) 50.5% (*d*) 52%

242. A shopkeeper allows a discount of 10% on the marked price of an item but charges a sales tax of 8% on the discounted price. If the customer pays ₹ 680.40 as the price including the sales tax, then what is the marked price of the item?
(*a*) ₹ 630 (*b*) ₹ 700
(*c*) ₹ 780 (*d*) None of these

243. At what percent above the cost price must a shopkeeper mark his goods so that he gains 20% even after giving a discount of 10% on the marked price? **(S.S.C., 2004; R.R.B., 2008)**
(*a*) 25% (*b*) 30%
(*c*) $33\frac{1}{3}\%$ (*d*) $37\frac{1}{2}\%$

244. A retailer allows a trade discount of 20% and a cash discount of $6\frac{1}{4}\%$ on the market price of the products and gets a net profit of 20% on the cost. By how much above the cost, should the products be labelled for sale? **(A.A.O., 2009; M.B.A., 2007)**
(*a*) 40% (*b*) 50%
(*c*) 60% (*d*) 70%

245. A shopkeeper marks his goods at such a price that after allowing a discount of 12.5% on the marked price, he still earns a profit of 10%. The marked price of an article which costs him ₹ 4900 is
(*a*) ₹ 5390 (*b*) ₹ 5490
(*c*) ₹ 6160 (*d*) ₹ 6260

246. By selling an article at $\frac{2}{5}$ of the marked price, there is a loss of 25%. The ratio of the marked price and the cost price of the article is
(*a*) 2 : 5 (*b*) 5 : 2
(*c*) 8 : 15 (*d*) 15 : 8

247. A video magazine distributor made 3500 copies of the March issue of the magazine at a cost of ₹ 350000. He gave 500 cassettes free to some key video libraries. He also allowed a 25% discount on the market price of the cassette and gave one extra cassette free with every 29 cassettes bought at a time. In this manner, he was able to sell all the 3500 cassettes that were produced. If the market price of a cassette was ₹ 150, then what is his gain or loss percent for the March issue of video magazine? **(M.A.T., 2005)**
(*a*) 10% gain (*b*) 25% loss
(*c*) 40% gain (*d*) 6.8% loss

248. A tradesman gives 4% discount on the marked price and gives 1 article free for buying every 15 articles and thus gains 35%. The marked price is above the cost price by
(*a*) 20% (*b*) 39%
(*c*) 40% (*d*) 50%

249. A trader marked the selling price of an article at 10% above the cost price. At the time of selling, he allows certain discount and suffers a loss of 1%. He allowed a discount of
(*a*) 9% (*b*) 10%
(*c*) 10.5% (*d*) 11%

250. A shopkeeper fixes the marked price of an item 35% above its cost price. The percentage of discount allowed to gain 8% is
(*a*) 20% (*b*) 27%
(*c*) 31% (*d*) 43%

251. A trader marked his goods at 20% above the cost price. He sold half the stock at the marked price, one quarter at a discount of 20% on the marked price and the rest at a discount of 40% on the marked price. His total gain is **(S.S.C., 2004)**
(*a*) 2% (*b*) 4.5%
(*c*) 13.5% (*d*) 15%

252. A product when sold with 10% rebate on the listed price gave a profit of ₹ 70. What was its cost price? **(Bank P.O., 2003)**
(*a*) ₹ 200
(*b*) ₹ 350
(*c*) ₹ 700
(*d*) Cannot be determined
(*e*) None of these

253. A manufacturer marked an article at ₹ 50 and sold it allowing 20% discount. If his profit was 25%, then the cost price of the article was **(S.S.C., 2010)**

(*a*) ₹ 30 (*b*) ₹ 32

(*c*) ₹ 35 (*d*) ₹ 40

254. The labelled price of a cupboard is ₹ 6500. The shopkeeper sold it by giving 5% discount on the labelled price and earned a profit of 15%. What approximately is the cost price of the cupboard? **(Bank P.O., 2008)**

(*a*) ₹ 5000 (*b*) ₹ 5350

(*c*) ₹ 5600 (*d*) ₹ 5800

(*e*) ₹ 6000

255. Kunal bought a suitcase with 15% discount on the labelled price. He sold the suitcase for ₹ 2880 with 20% profit on the labelled price. At what price did he buy the suitcase?

(*a*) ₹ 2040 (*b*) ₹ 2400

(*c*) ₹ 2604 (*d*) ₹ 2640

(*e*) None of these

256. A shopkeeper sells a badminton racket, whose marked price is ₹ 30, at a discount of 15% and gives a shuttle cock costing ₹ 1.50 free with each racket. Even then he makes a profit of 20%. His cost price per racket is

(*a*) ₹ 19.75 (*b*) ₹ 20

(*c*) ₹ 21 (*d*) ₹ 21.25

257. If a commission of 10% is given on the written price of an article, the gain is 20%. If the commission is increased to 20%, the gain is **(R.R.B., 2008)**

(*a*) $6\frac{2}{3}\%$ (*b*) $7\frac{1}{4}\%$

(*c*) $12\frac{1}{2}\%$ (*d*) $13\frac{1}{3}\%$

258. A shopkeeper offered a discount of 15% on the labelled price. By selling an article for ₹ 340 after giving discount he earned a profit of $13\frac{1}{3}\%$. What would have been the percent profit earned if no discount was offered? **(Bank P.O., 2008)**

(*a*) 27 (*b*) $28\frac{1}{3}$

(*c*) $30\frac{1}{3}$ (*d*) $33\frac{1}{3}$

(*e*) None of these

259. A shopkeeper sold an air-conditioner for ₹ 25935 with a discount of 9% and earned a profit of 3.74%. What would have been the percentage of profit if no discount were offered? **(M.B.A., 2006)**

(*a*) 12.3% (*b*) 15.6%

(*c*) 16% (*d*) None of these

260. A shopkeeper sells 25 articles at ₹ 45 per article after giving 10% discount and earns 50% profit. If the discount is not given, the profit gained is

(*a*) 60% (*b*) $60\frac{2}{3}\%$

(*c*) 66% (*d*) $66\frac{2}{3}\%$

(*e*) None of these

261. A shopkeeper sold sarees at ₹ 266 each after giving 5% discount on labelled price. Had he not given the discount, he would have earned a profit of 12% on the cost price. What was the cost price of each saree?

(*a*) ₹ 240 (*b*) ₹ 260

(*c*) ₹ 280 (*d*) Data inadequate

(*e*) None of these

262. The marked price of a shirt and trousers are in the ratio 1 : 2. The shopkeeper gives 40% discount on the shirt. If the total discount on the set of the shirt and trousers is 30%, the discount offered on the trousers is **(S.S.C., 2007)**

(*a*) 15% (*b*) 20%

(*c*) 25% (*d*) 30%

263. If the selling price of an article is five times the discount offered and if the percentage of discount is equal to the percentage profit, find the ratio of the discount offered to the cost price.

(*a*) 1 : 5 (*b*) 1 : 6

(*c*) 7 : 30 (*d*) 11 : 30

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

(*a*) 10% (*b*) 20%

(*c*) 25% (*d*) None of these

265. A shopkeeper sold an article offering a discount of 5% and earned a profit of 23.5%. What would have been the percentage of profit earned if no discount was offered?

(*a*) 24.5 (*b*) 28.5

(*c*) 30 (*d*) Data inadequate

(*e*) None of these

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

(*a*) 25 (*b*) 30

(*c*) 40 (*d*) 66.67

267. Peter bought an item at 20% discount on its original price. He sold it with 40% increase on the price he bought it. The new sale price is by what percent more than the original price?

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

268. Tarun got 30% concession on the labelled price of an article and sold it for ₹ 8750 with 25% profit on the price he bought. What was the labelled price?
(*a*) ₹ 10,000 (*b*) ₹ 12,000
(*c*) ₹ 16,000 (*d*) Data inadequate
(*e*) None of these

269. A merchant marks his goods at 25% above the cost price. Due to a slump in the market, his cost reduces by 5%. He thus offers a discount of 8% due to which the sales go up by 25%. Compute the change in the merchant's profit.
(*a*) 5% higher (*b*) $7\frac{1}{2}\%$ higher
(*c*) 8% lower (*d*) Unchanged

270. Aditya, a trader, sells an item to a retailer at 20% discount, but charges 10% on the discounted price, for delivery and packaging. The retailer sells it for ₹ 2046 more, thereby earning a profit of 25%. At what price had the trader marked the item?
[IBPS—RRB Officers Gr. 'B' Exam, 2015]
(*a*) ₹ 9400 (*b*) ₹ 9000
(*c*) ₹ 8000 (*d*) ₹ 9300

271. A box is bought of ₹ 75 and sold at a gain of 8%. Find its selling price
[Indian Railway Gr. 'D' Exam, 2014]
(*a*) 81 (*b*) 82
(*c*) 89 (*d*) 86

272. Oranges are bought at 5 for ₹ 10 and sold at 6 for ₹ 15. The gain percent is
[Indian Railway Gr. 'D' Exam, 2014]
(*a*) 50% (*b*) 40%
(*c*) 35% (*d*) 25%

273. Dhar bought two articles A and B at a total cost of ₹ 8000. He sold article A at 20% profit and article B at 12% loss. In the whole deal he made no gain and no loss. At what price should Dhar have sold article B to make an overall profit of 25%?
[RBI Gr. 'B' (Phase I) Exam, 2015]
(*a*) ₹ 5200 (*b*) ₹ 5800
(*c*) ₹ 6400 (*d*) ₹ 6200

274. A dealer marked the price of an item 40% above the cost price. He allowed two successive discounts of 20% and 25% to a particular customer. As a result he incurred a loss of ₹448. At what price did he sell the item to the said customer?
[IBPS—Bank Spl. Officer (IT) Exam, 2015]
(*a*) ₹ 2,416 (*b*) ₹ 2,352
(*c*) ₹ 2,268 (*d*) ₹ 2, 152

275. The marked price is 10% higher than the cost price. A discount of 10% is given on the marked price. In this kind of sale, the seller
[SSC—CHSL (10 + 2) Exam, 2015]
(*a*) gains 2% (*b*) bears no loss, no gain
(*c*) gains 1% (*d*) loses 1%

276. The profit earned by selling a article at ₹ 5520 is equal to the loss incurred on selling the same article at ₹ 4080. What will be percent profit, if the article is sold at ₹ 6000?
[United India Insurance (UIICL) Assistant (Online) Exam, 2015]
(*a*) 20 (*b*) 12
(*c*) 25 (*d*) 15

277. Rajlani sold a machine for ₹ 22, 000 with a discount of 8% on the labeled price and made a profit of $22\frac{2}{3}\%$. What would have been the profit percent if the machine was sold without any discount on the labeled price?
[NICL—AAO Exam, 2015]
(*a*) 36 1/3 (*b*) 30 2/3
(*c*) 27 1/3 (*d*) 33 1/3

278. An item was bought for ₹ X and sold for ₹ Y, thereby earning a profit of 20%. Had the value of X been 15 less and the value of Y ₹ 76 less, a profit of 30% would have been earned. What was the value of 'X'? **[IBPS—RRB Officers Gr. 'B' Exam, 2015]**
(*a*) ₹ 640 (*b*) ₹ 400
(*c*) ₹ 600 (*d*) ₹ 800

279. A trader has 600 kgs of rice, a part of which he sells at 15% profit and the remaining quantity at 20% loss. On the whole, he incurs an overall loss of 6%. What is the quantity of rice he sold at 20% loss?
[IBPS—Bank PO/MT Exam, 2015]
(*a*) 250 kgs (*b*) 320 kgs
(*c*) 420 kgs (*d*) 360 kgs

280. When an article was sold for ₹ 696, percent profit earned was P%. When the same article was sold for ₹ 841, percent profit earned was (p + 25%). What is the value of P?
[IBPS—RRB Officer Assistant (Online) Exam, 2015]
(*a*) 10 (*b*) 25
(*c*) 15 (*d*) 20

281. Raza purchased a bicycle for ₹ 6810. He had paid a VAT of 13.5%. The list price of the bicycle was
[SSC—CHSL (10+2) Exam, 2015]
(*a*) ₹ 6696.50 (*b*) ₹ 6140
(*c*) ₹ 5970.50 (*d*) ₹ 6000

282. Srinivas sold an article for ₹ 6800 and incurred a loss. Had he sold the article for ₹ 7850, his gain would have been equal to half of the amount of loss that he incurred. At what price should he sell the article to have 20% profit?
[IBPS—Bank PO (Pre.) Exam, 2015]

(*a*) ₹ 7500 (*b*) ₹ 9000
(*c*) ₹ 10680 (*d*) ₹ 9600

283. Subroto sold an article for ₹ 528 after allowing a discount of 12% on its marked price. What was the marked price of the article?
[ESIC—UDC Exam, 2016]
(*a*) ₹ 600 (*b*) ₹ 700
(*c*) ₹ 650 (*d*) ₹ 590

284. Sanjay made a profit of 8% by selling a shirt after offering a discount of 12%. If the marked price of the shirt is ₹ 1080, find its cost price.
[SBI Jr. Associates (Pre.) Exam, 2016]
(*a*) 890 (*b*) 780
(*c*) 880 (*d*) 900

285. The sale price of an article including the sales tax is ₹ 1232. The rate of sales tax is 10%. If the shopkeeper has made a profit of 12%, then the cost price of the article is
[DMRC—Train Operator (Station Controller) Exam, 2016]
(*a*) ₹ 900 (*b*) ₹ 950
(*c*) ₹ 1000 (*d*) ₹ 1120

286. The value of a machine depreciates every year at the rate of 10% on its value at the beginning of that year. If the present value of the machine is ₹ 729, its worth three years ago was **[CLAT, 2016]**
(*a*) ₹ 947.70 (*b*) ₹ 1000
(*c*) ₹ 750.87 (*d*) ₹ 800

287. Meena Kumari goes to a shop and buys a saree, costing ₹ 5,225, including sales tax of 12%. The shopkeeper gives her a discount, so that the price is decreased by an amount equivalent to sales tax. The price is decreased by (nearest value).
[IBPS—Bank Specialist Officer (Marketing) Exam, 2016]
(*a*) ₹ 615 (*b*) ₹ 650
(*c*) ₹ 560 (*d*) ₹ 580

288. The profit earned by selling a chair for ₹ 752 is 1.2 times the loss incurred when the same chair was sold for ₹ 400. What is the cost price of the chair?
[DMRC—Customer Relations Assistant (CRA) Exam, 2016]
(*a*) ₹ 540 (*b*) ₹ 592
(*c*) ₹ 560 (*d*) None of these

289. A publisher sells copies of books to a retail dealer at ₹ 5 per copy but allows 24 copies to be counted as 24. If the retailer sells each of the 25 copies at ₹ 6, his profit per cent is
[DMRC—Jr. Engineer (Electronics) Exam, 2016]
(*a*) 20% (*b*) 24%
(*c*) 25% (*d*) 40%

290. Supriya sold a washing machine for ₹ 8500. She incurred a loss of 15% in this transaction. At what price had she bought the washing machine?
[ESIC—UDC Exam, 2016]
(*a*) ₹ 10000 (*b*) ₹ 1200
(*c*) ₹ 11000 (*d*) ₹ 10500

291. The price of a cycle is marked at ₹ 1150. A shopkeeper earns a profit of 15% after allowing a discount of 15% on the marked price. Find the cost price of the cycle. **[ESIC—UDC Exam, 2016]**
(*a*) ₹ 900 (*b*) ₹ 1000
(*c*) ₹ 850 (*d*) ₹ 950

292. The price of an article is first increased by 20% and later on decreased by 25% due to reduction in sales. Find the net percentage change in final price of the article.
[SBI Jr. Associates (Pre.) Exam, 2016]
(*a*) 20% (*b*) 18%
(*c*) 38% (*d*) None of these

ANSWERS

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

141. (*d*)	**142.** (*a*)	**143.** (*c*)	**144.** (*d*)	**145.** (*c*)	**146.** (*a*)	**147.** (*d*)	**148.** (*d*)	**149.** (*c*)	**150.** (*b*)
151. (*b*)	**152.** (*d*)	**153.** (*b*)	**154.** (*a*)	**155.** (*b*)	**156.** (*d*)	**157.** (*b*)	**158.** (*a*)	**159.** (*a*)	**160.** (*b*)
161. (*c*)	**162.** (*a*)	**163.** (*b*)	**164.** (*b*)	**165.** (*c*)	**166.** (*d*)	**167.** (*d*)	**168.** (*c*)	**169.** (*d*)	**170.** (*c*)
171. (*c*)	**172.** (*c*)	**173.** (*d*)	**174.** (*d*)	**175.** (*c*)	**176.** (*c*)	**177.** (*d*)	**178.** (*c*)	**179.** (*c*)	**180.** (*b*)
181. (*b*)	**182.** (*a*)	**183.** (*a*)	**184.** (*d*)	**185.** (*a*)	**186.** (*b*)	**187.** (*b*)	**188.** (*c*)	**189.** (*a*)	**190.** (*c*)
191. (*d*)	**192.** (*b*)	**193.** (*d*)	**194.** (*b*)	**195.** (*d*)	**196.** (*a*)	**197.** (*b*)	**198.** (*c*)	**199.** (*b*)	**200.** (*b*)
201. (*c*)	**202.** (*a*)	**203.** (*c*)	**204.** (*c*)	**205.** (*a*)	**206.** (*c*)	**207.** (*b*)	**208.** (*c*)	**209.** (*b*)	**210.** (*b*)
211. (*a*)	**212.** (*d*)	**213.** (*a*)	**214.** (*c*)	**215.** (*d*)	**216.** (*b*)	**217.** (*a*)	**218.** (*c*)	**219.** (*b*)	**220.** (*b*)
221. (*c*)	**222.** (*d*)	**223.** (*b*)	**224.** (*a*)	**225.** (*c*)	**226.** (*b*)	**227.** (*a*)	**228.** (*d*)	**229.** (*b*)	**230.** (*a*)
231. (*b*)	**232.** (*a*)	**233.** (*a*)	**234.** (*a*)	**235.** (*a*)	**236.** (*a*)	**237.** (*b*)	**238.** (*c*)	**239.** (*c*)	**240.** (*c*)
241. (*a*)	**242.** (*b*)	**243.** (*c*)	**244.** (*c*)	**245.** (*c*)	**246.** (*d*)	**247.** (*d*)	**248.** (*d*)	**249.** (*b*)	**250.** (*a*)
251. (*a*)	**252.** (*d*)	**253.** (*b*)	**254.** (*b*)	**255.** (*a*)	**256.** (*b*)	**257.** (*a*)	**258.** (*d*)	**259.** (*d*)	**260.** (*d*)
261. (*e*)	**262.** (*c*)	**263.** (*c*)	**264.** (*c*)	**265.** (*c*)	**266.** (*d*)	**267.** (*d*)	**268.** (*a*)	**269.** (*d*)	**270.** (*d*)
271. (*a*)	**272.** (*d*)	**273.** (*c*)	**274.** (*b*)	**275.** (*d*)	**276.** (*c*)	**277.** (*d*)	**278.** (*d*)	**279.** (*d*)	**280.** (*d*)
281. (*d*)	**282.** (*c*)	**283.** (*a*)	**284.** (*c*)	**285.** (*c*)	**286.** (*b*)	**287.** (*c*)	**288.** (*c*)	**289.** (*c*)	**290.** (*a*)
291. (*c*)	**292.** (*d*)								

SOLUTIONS

1. C.P. = ₹ 12000, S.P. = ₹ 15000. Profit = ₹ (15000 − 12000) = ₹ 3000.

$\therefore$ Profit % $= \left(\frac{3000}{12000}\times 100\right)\% = 25\%$.

2. (*a*) Profit % $= \left(\frac{17}{36}\times 100\right)\% = 47\frac{2}{9}\%$.

(*b*) Profit % $= \left(\frac{24}{50}\times 100\right)\% = 48\%$.

(*c*) Profit % $= \left(\frac{19}{40}\times 100\right)\% = 47\frac{1}{2}\%$.

(*d*) Profit % $= \left(\frac{29}{60}\times 100\right)\% = 48\frac{1}{3}\%$.

Clearly, (*d*) is the best transaction.

3. Least C.P. = ₹ (200 × 8) = ₹ 1600.

Greatest S.P. = ₹ (425 × 8) = ₹ 3400.

Required profit = ₹ (3400 − 1600) = ₹ 1800.

4. Profit = ₹ (2602.58 − 2090.42) = ₹ 512.16.

Profit % $= \left(\frac{512.16}{2090.42}\times 100\right)\% = \left(\frac{512160}{209042}\times 10\right)\%$

$= 24.5\% \approx 25\%$.

5. C.P. = ₹ 7840, Profit = 7%.

$\therefore$ S.P. = ₹ $\left(\frac{107}{100}\times 7840\right)$ = ₹ 8388.80.

6. Total C.P. = ₹ (5400 + 9600) = ₹ 15000.

Total S.P. = ₹ $\left(\frac{3}{4}\text{ of }5400 + \frac{4}{3}\text{ of }9600\right)$

= ₹ $\left(5400\times\frac{3}{4} + 9600\times\frac{4}{3}\right)$ = ₹ (4050 + 12800)

= ₹ 16850.

Profit = ₹ (16850 − 15000) = ₹ 1850.

7. Total C.P. = ₹ (12000 + 10000) = ₹ 22000.

Total S.P. = ₹ $\left(\frac{108}{100}\times 12000 + \frac{88}{100}\times 10000\right)$

= ₹ (12960 + 8800) = ₹ 21760.

$\therefore$ Loss = ₹ (22000 − 21760) = ₹ 240.

8. Total C.P. = ₹ (12500 + 300 + 800) = ₹ 13600. Profit = 15%.

$\therefore$ S.P. = ₹ $\left(\frac{115}{100}\times 13600\right)$ = ₹ 15640.

9. Total C.P. = ₹ (4500 × 15) = ₹ 67500.

Total S.P. = ₹ 81000.

Profit = ₹ (81000 − 67500) = ₹ 13500.

$\therefore$ Profit % $= \left(\frac{13500}{67500}\times 100\right)\%$ = 20%.

10. C.P. = ₹ (4700 + 800) = ₹ 5500; S.P. = ₹ 5800.

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

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

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

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

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

13. C.P. of 1 orange = ₹ $\left(\frac{350}{100}\right)$ = ₹ 3.50. S.P. of 1 orange

= ₹ $\left(\frac{48}{12}\right)$ = ₹ 4.

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

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

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

15. S.P. = ₹ 100, Gain = ₹ 15.

∴ C.P. = ₹ (100 − 15) = ₹ 85.

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

16. Total C.P. = Cost + Overhead expenses = ₹ (150 + 12% of 150) = ₹ (150 + 18) = ₹ 168.

∴ S.P. = ₹ $\left(\frac{110}{100}\times 168\right)$ = ₹ 184.80.

17. C.P. of 10 articles = ₹ 8. S.P. of 10 articles

= ₹ (1.25 × 10) = ₹ 12.5.

Profit = ₹ (12.5 − 8) = ₹ 4.50.

∴ Profit % = $\left(\frac{4.5}{8}\times 100\right)\% = 56\frac{1}{4}\%$.

18. Let C.P. = ₹ x. Profit = 200 %.

∴ S.P. = 300% of ₹ x = ₹ $3x$.

Required ratio = $x : 3x = 1 : 3$.

19. Let C.P. = ₹ $10x$ and S.P. = ₹ $11x$.

Profit = ₹ $(11x - 10x)$ = ₹ x.

∴ Profit % = $\left(\frac{x}{10x}\times 100\right)\% = 10\%$.

20. Let C.P. = ₹ x. Loss = $12\frac{1}{2}\%$.

S.P. = $87\frac{1}{2}\%$ of ₹ x = ₹ $\left(\frac{175}{2}\times\frac{1}{100}\times x\right) = ₹\frac{7x}{8}$.

∴ Required ratio = $x : \frac{7x}{8} = 8:7$.

21. C.P. = ₹ p. Gain = r%. ∴ S.P. = q

= $(100 + r)$% of ₹ p = $\frac{p(100+r)}{100}$.

22. S.P. = ₹ 23680. Profit = 28%.

∴ C.P. = ₹ $\left(\frac{100}{128}\times 23680\right)$ = ₹ 18500.

23. S.P. = ₹ 14500. Loss = 20%.

∴ C.P. = ₹ $\left(\frac{100}{80}\times 14500\right)$ = ₹ 18125.

24. C.P. = ₹ $\left(\frac{100}{122.50}\times 392\right)$ = ₹ $\left(\frac{1000}{1225}\times 392\right)$ = ₹ 320.

∴ Profit = ₹ (392 − 320) = ₹ 72.

25. 110% of S.P. = 616 ⇒ S.P. = ₹ $\left(\frac{616\times 100}{110}\right)$ = ₹ 560.

∴ C.P. = ₹ $\left(\frac{100}{112}\times 560\right)$ = ₹ 500.

26. Total C.P. = ₹ (144 × 0.90) = ₹ 129.60.

Total S.P. = ₹ (124 × 1.20) = ₹ 148.80.

Gain = ₹ (148.80 − 129.60) = ₹ 19.20.

∴ Gain % = $\left(\frac{19.20}{129.60}\times 100\right)\% = 14.81\%$.

27. Total C.P. = ₹ (140 × 450 + 250 × 550)

= ₹ (63000 + 137500) = ₹ 200500.

Total S.P. = ₹ $\left(\frac{140}{100}\times 200500\right)$ = ₹ 280700.

∴ Average S.P. = ₹ $\left(\frac{280700}{140+250}\right)$ = ₹ $\left(\frac{280700}{390}\right)$

= ₹ 719.74 ≈ 720.

28. Total C.P. of (10 × 12) *i.e.*, 120 pens = ₹ (4 × 10) = ₹ 40.

Number of working pens = (120 − 20) = 100.

Total S.P. of 100 pens = ₹ $\left(\frac{125}{100}\times 40\right)$ = ₹ 50.

∴ S.P. of each pen = ₹ $\left(\frac{50}{100}\right)$ = 50 paise.

29. Total investment = ₹ $\left(120\times 80 + 280 + \frac{40}{100}\times 120 + 72\right)$

= ₹ (9600 + 280 + 48 + 72)

= ₹ 10000.

S.P. of 120 reams = 108% of ₹ 10000 = ₹ 10800.

∴ S.P. per ream = ₹ $\left(\frac{10800}{120}\right)$ = ₹ 90.

30. Investment = ₹ (20 × 8 + 10) = ₹ 170.

Receipt = ₹ (30 × 5 + 20 × 4) = ₹ 230.

∴ Gain % = $\left(\frac{60}{170}\times 100\right)\%$ = 35.29% ≈ 35.3%.

31. Let the C.P. be ₹ x.

Then, 20% of x = 1100 ⇒ $\frac{20}{100}\times x = 1100 \Rightarrow x = 5500$.

C.P. = ₹ 5500, Expenditure on repairs = 10%.

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

∴ Expenditure on repairs = ₹ (5500 − 5000) = ₹ 500.

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

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

Loss to the manufacturer = ₹ [38000 − (25 × 1000)]

= ₹ 13000.

33. Ratio of profit = Ratio of investments = $\frac{3}{2}:1 = 3:2$.

Profit = ₹ (26250 − 25000) = ₹ 1250.

∴ Vinit's share = ₹ $\left(\frac{2}{5}\times 1250\right)$ = ₹ 500.

34. C.P. = ₹ $\left(600 + \frac{600\times 6\times 4}{100\times 12}\right)$ = ₹ 612.

Gain = ₹ (765 − 612) = ₹ 153.

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

35. Let the new S.P. be ₹ x.

Then, 114 : 2850 = 108 : $x \Rightarrow x = \left(\frac{2850\times 108}{114}\right)$ = 2700.

36. Let the new S.P. be ₹ x.

Then, 85 : 18700 = 115 : $x \Rightarrow x = \left(\frac{18700 \times 115}{85}\right) = 25300$.

37. Let the new S.P. be ₹ x.

Then, 80 : 9 = 105 : $x \Rightarrow x = \left(\frac{9 \times 105}{80}\right) = 11.81$.

38. Initial investment = ₹ 8200.

S.P. of 1st item = ₹ $\left(\frac{125}{100} \times 8200\right)$ = ₹ 10250.

C.P. of 2nd item = ₹ 10250. Loss = 20%.

Final receipt = S.P. of 2nd item = ₹ $\left(\frac{80}{100} \times 10250\right)$

= ₹ 8200.

Since initial investment = final receipt, there was neither gain nor loss.

39. C.P. = ₹ $\left(\frac{100}{105} \times 630000\right)$ = ₹ 600000.

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

40. C.P. of 1st transistor = ₹ $\left(\frac{100}{120} \times 840\right)$ = ₹ 700.

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

So, total C.P. = ₹ (700 + 1000) = 1700.
Total S.P. = ₹ (840 + 960) = ₹ 1800.

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

41. Let C.P. = ₹ x. Then, S.P. = ₹ $\frac{4x}{3}$.

Gain = ₹ $\left(\frac{4x}{3} - x\right) = ₹\frac{x}{3}$.

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

42. Let C.P. = ₹ $5x$ and S.P. = ₹ $7x$.
Then, Gain = ₹ $2x$.
$\therefore$ Required ratio = $2x : 5x = 2 : 5$.

43. Let C.P. of the article be ₹ p.

Then, x = 85% of ₹ p = ₹ $\frac{85}{100}p$.

And, y = 115% of ₹ p = ₹ $\frac{115}{100}p$.

$\therefore (y - x) : (y + x) = \left(\frac{115}{100}p - \frac{85}{100}p\right) : \left(\frac{115}{100}p + \frac{85}{100}p\right)$

$= \frac{30}{100}p : \frac{200}{100}p = \frac{3}{10} : 2 = 3 : 20$.

44. Let C.P. = ₹ x. Then, S.P. = 110% of ₹ x = ₹ $\frac{11x}{10}$.

New S.P. = ₹ $\left(2 \times \frac{11x}{10}\right) = ₹\frac{11x}{5}$. Gain = ₹ $\left(\frac{11x}{5} - x\right) = ₹\frac{6x}{5}$.

$\therefore$ Gain% = $\left(\frac{6x}{5} \times \frac{1}{x} \times 100\right)\% = 120\%$.

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

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

46. Let S.P. = ₹ x. New S.P. = ₹ $\frac{x}{2}$, Loss = 30%.

So, C.P. = ₹ $\left(\frac{100}{70} \times \frac{x}{2}\right)$ = ₹ $\frac{5x}{7}$.

Profit = ₹ $\left(x - \frac{5x}{7}\right) = ₹\frac{2x}{7}$.

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

47. C.P. = $\frac{40}{100}$ × S.P. $\Rightarrow$ S.P. = $\frac{5}{2}$

C.P. = $\left(\frac{5}{2} \times 100\right)\%$ of C.P. = 250% of C.P.

48. Let the C.P. be ₹ x.

Then, $x - 15 = \frac{x}{16} \Rightarrow x - \frac{x}{16} = 15 \Rightarrow \frac{15x}{16} = 15 \Rightarrow x = 16$.

$\therefore$ C.P. = ₹ 16.

49. S.P. = C.P. + $\frac{1}{4}$C.P. = $\frac{5}{4}$C.P.

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

50. Let S.P. = ₹ 100. Then, Loss = ₹ 10, C.P. = ₹ (100 + 10) = ₹ 110.

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

51. Let S.P. = ₹ x. Then, Loss = ₹ $\frac{x}{3}$.

C.P. = ₹ $\left(x + \frac{x}{3}\right) = ₹\frac{4x}{3}$.

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

52. Let C.P. = ₹ 100. Then, Profit = ₹ 320, S.P. = ₹ 420.
New C.P. = 125% of ₹ 100 = ₹ 125; New S.P. = ₹ 420.
Profit = ₹ (420 − 125) = ₹ 295.

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

53. Let the price of the car be ₹ 100.
Then, C.P. = 80% of ₹ 100 = ₹ 80.
S.P. = 120% of ₹ 100 = ₹ 120.
Gain = ₹ (120 − 80) = ₹ 40.

$\therefore$ Gain% = $\left(\frac{40}{80} \times 100\right)\% = 50\%$.

54. Let C.P. = ₹ x. Then, $1754 - x = x - 1492$
$\Rightarrow 2x = 3246 \Rightarrow x = 1623$.

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

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

56. Let C.P. = ₹ x. Then, $900 - x = 2(x - 450)$
$\Rightarrow 3x = 1800 \Rightarrow x = 600$.
$\therefore$ Required S.P. = 125% of ₹ 600 = ₹ $\left(\frac{125}{100} \times 600\right)$ = ₹ 750.

57. Let C.P. be ₹ x.
Then, $\frac{1920 - x}{x} \times 100 = \frac{x - 1280}{x} \times 100 \Rightarrow 1920 - x = x - 1280$
$\Rightarrow 2x = 3200 \Rightarrow x = 1600$.
$\therefore$ Required S.P. = 125% of ₹ 1600
= ₹ $\left(\frac{125}{100} \times 1600\right)$ = ₹ 2000.

58. Let C.P. be ₹ x.
Then, $(1060 - x) = \frac{120}{100}(x - 950)$
$\Rightarrow 106000 - 100x = 120x - 120 \times 950$
$\Rightarrow 220x = 220000 \Rightarrow x = 1000$.
$\therefore$ Desired S.P. = ₹ $\left(\frac{120}{100} \times 1000\right)$ = ₹ 1200.

59. Let C.P. be ₹ x.
Then, $\frac{116 - x}{x} \times 100 = 3\left[\frac{92 - x}{x} \times 100\right] \Leftrightarrow x = 80$.

60. Let C.P. of each book be ₹ 1.
Then, C.P. of 20 books = ₹ 20; S.P. of 20 books = ₹ 15.
$\therefore$ Loss% = $\left(\frac{5}{20} \times 100\right)\% = 25\%$.

61. Let C.P. of each article be ₹ 1.
Then, C.P. of 7 articles = ₹ 7; S.P. of 7 articles = ₹ 10.
$\therefore$ Gain% = $\left(\frac{3}{7} \times 100\right)\% = 42\frac{6}{7}\%$.

62. Let M.P. of each pen be ₹ 1.
Then, C.P. of 20 pens = ₹ 16; S.P. of 20 pens = ₹ 20.
$\therefore$ Gain% = $\left(\frac{4}{16} \times 100\right)\% = 25\%$.

63. Let C.P. of each sheep be ₹ 1.
Then, C.P. of 700 sheep = ₹ 700; S.P. of 700 sheep = ₹ 749.
$\therefore$ Gain% = $\left(\frac{49}{700} \times 100\right)\% = 7\%$.

64. Let C.P. of each mango be ₹ 1.
C.P. of 110 mangoes = ₹ 110, S.P. of 110 mangoes = ₹ 120.
$\therefore$ Gain% = $\left(\frac{10}{110} \times 100\right)\% = 9\frac{1}{11}\%$.

65. Let C.P. of each article be ₹ 1. C.P. of x articles = ₹ x; S.P. of x articles = ₹ 20.
Profit = ₹ $(20 - x)$.
$\therefore \frac{20 - x}{x} \times 100 = 25 \Rightarrow 2000 - 100x = 25x$
$\Rightarrow 125x = 2000 \Rightarrow x = 16$.

66. Clearly, the retailer gets 1 dozen out of 6 dozens free.
$\therefore$ Equivalent discount = $\left(\frac{1}{6} \times 100\right)\% = 16\frac{2}{3}\%$.

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

68. (S.P. of 20 dining tables) – (C.P. of 20 dining tables)
= S.P. of 4 dining tables
$\Rightarrow$ C.P. of 20 dining tables = S.P. of 16 dining tables
= ₹ 12000
$\Rightarrow$ S.P. of 1 dining table = ₹ $\left(\frac{12000}{16}\right)$ = ₹ 750.

69. (S.P. of 100 pencils) – (C.P. of 100 pencils)
= S.P. of 20 pencils
$\Rightarrow$ C.P. of 100 pencils = S.P. of 80 pencils.
Let C.P. of each pencil be ₹ 1.
Then, C.P. of 80 pencils = ₹ 80; S.P. of 80 pencils = ₹ 100.
$\therefore$ Gain % = $\left(\frac{20}{80} \times 100\right)\% = 25\%$.

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

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

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

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

74. Suppose Vinod has n pencils.
Then, $2.50n - 1.75n = 110 + 55$
$\Rightarrow 0.75n = 165 \Rightarrow n = \frac{165}{0.75} = 220$.

75. C.P. of 1600 eggs = ₹ $\left(\frac{3.75}{12} \times 1600\right) = ₹ 500$.
S.P. of 1600 eggs = ₹ $\left(\frac{1}{2} \times 900 + \frac{2}{5} \times 700\right) = ₹ 730$.
$\therefore$ Gain% = $\left(\frac{230}{500} \times 100\right)\% = 46\%$.

76. Suppose, number of knives bought = L.C.M. of 11 and 10 = 110.

C.P. of 110 knives = ₹ $\left(\frac{10}{11}\times 110\right)$ = ₹ 100.

S.P. of 110 knives = ₹ $\left(\frac{11}{10}\times 110\right)$ = ₹ 121.

∴ Profit% = $\left(\frac{21}{100}\times 100\right)\% = 21\%$.

77. Suppose, number of oranges bought = L.C.M. of 5 and 6 = 30.

C.P. of 30 oranges = ₹ $\left(\frac{10}{5}\times 30\right)$ = ₹ 60.

S.P. of 30 oranges = ₹ $\left(\frac{15}{6}\times 30\right)$ = ₹ 75.

∴ Profit% = $\left(\frac{15}{60}\times 100\right)\% = 25\%$.

78. Suppose number of lemons bought = L.C.M. of 2 and 5 = 10.

C.P. of 10 lemons = ₹ $\left(\frac{1}{2}\times 10\right)$ = ₹ 5.

S.P. of 10 lemons = ₹ $\left(\frac{3}{5}\times 10\right)$ = ₹ 6.

∴ Profit% = $\left(\frac{1}{5}\times 100\right)\% = 20\%$.

79. Suppose number of pencils bought = L.C.M. of 6 and 4 = 12.

C.P. of 12 pencils = ₹ $\left(\frac{4}{6}\times 12\right)$ = ₹ 8.

S.P. of 12 pencils = ₹ $\left(\frac{6}{4}\times 12\right)$ = ₹ 18.

∴ Gain% = $\left(\frac{10}{8}\times 100\right)\% = 125\%$.

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

C.P. of 56 pencils = ₹ $\left(\frac{9}{7}\times 56\right)$ = ₹ 72.

S.P. of 56 pencils = ₹ $\left(\frac{11}{8}\times 56\right)$ = ₹ 77.

Now, ₹ 5 are gained on 56 pencils.

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

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

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

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

Hence, S.P. per dozen = ₹ 6.

82. Suppose he buys 6 eggs of each kind.

C.P. of 12 eggs = ₹ $\left(\frac{1}{2}\times 6+\frac{2}{3}\times 6\right)$

= ₹ 7. S.P. of 12 eggs = ₹ $\left(\frac{3}{5}\times 12\right)$ = ₹ 7.20.

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

83. Suppose number of marbles bought of each kind = L.C.M. of 20, 30, 25 = 300.

C.P. of 600 marbles = ₹ $\left(\frac{1}{20}\times 300+\frac{1}{30}\times 300\right)$ = ₹ 25.

S.P. of 600 marbles = ₹ $\left(\frac{1}{25}\times 600\right)$ = ₹ 24.

∴ Loss% = $\left(\frac{1}{25}\times 100\right)\% = 4\%$.

84. C.P. of 2 dozen oranges = ₹ (10 + 8) = ₹ 18.

S.P. of 2 dozen oranges = ₹ 22.

If profit is ₹ 4, oranges bought = 2 dozen.

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

dozens = 60 dozens.

85. Suppose number of articles bought of each kind = L.C.M. of 5, 4, 9 = 180.

C.P. of 360 articles = ₹ $\left(\frac{1}{5}\times 180+\frac{1}{4}\times 180\right)$ = ₹ 81.

S.P. of 360 articles = ₹ $\left(\frac{2}{9}\times 360\right)$ = ₹ 80.

If loss is ₹ 1, articles bought = 360.

If loss is ₹ 3 , articles bought = (360 × 3) = 1080.

86. L.C.M. of 2, 3, 4, 5 = 60.

Suppose the grocer purchased (60 × 1), (60 × 2), (60 × 3) lemons *i.e.*, 60, 120 and 180 lemons of first, second and third qualities respectively.

Then, C.P. of 60 lemons of first quality = ₹ $\left(\frac{1}{2}\times 60\right)$ = ₹ 30.

C.P. of 120 lemons of second quality = ₹ $\left(\frac{2}{3}\times 120\right)$ = ₹ 80.

C.P. of 180 lemons of third quality = ₹ $\left(\frac{3}{4}\times 180\right)$ = ₹ 135.

Total C.P. of (60 + 120 + 180) *i.e.*, 360 lemons = ₹ (30 + 80 + 135) = ₹ 245.

S.P. of 360 lemons = ₹ $\left(\frac{4}{5}\times 360\right)$ = ₹ 288.

Gain = ₹ (288 − 245) = ₹ 43.

∴ Gain% = $\left(\frac{43}{245}\times 100\right)\% = 17.56\%$.

87. C.P. of 6 toffees = ₹ 1. S.P. of 6 toffees = 120% of ₹ 1 = ₹ $\frac{6}{5}$.

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

88. C.P. of 8 pens = ₹ 100. S.P. of 8 pens = 160% of ₹ 100 = ₹ 160.

For ₹ 160, pens sold = 8.

For ₹ 100, pens sold = $\left(\frac{8}{160}\times 100\right)$ = 5.

89. Let S.P. of 12 toffees be ₹ x.

Then, 80 : 1 = 120 : x or x = $\left(\frac{120}{80}\right)=\frac{3}{2}$.

For ₹ $\frac{3}{2}$, toffees sold = 12.

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

90. Let S.P. of 45 lemons be ₹ x.

Then, 80 : 40 = 120 : x or $x = \left(\frac{120 \times 40}{80}\right) = 60$.

For ₹ 60, lemons sold = 45.

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

91. S.P. of 90 ball pens = ₹ 160, Loss = 20%.

C.P. of 90 ball pens = ₹ $\left(\frac{100}{80} \times 160\right) =$ ₹ 200.

∴ Desired S.P. of 90 ball pens = ₹ $\left(\frac{120}{100} \times 200\right) =$ ₹ 240.

For ₹ 240, ball pens sold = 90.

For ₹ 96, ball pens sold = $\left(\frac{90}{240} \times 96\right) = 36$.

92. Total fare collected at full occupancy
= ₹ (8 × 72 × 300 + 2 × 64 × 898 + 2 × 45 × 1388 + 1 × 26 × 2691)
= ₹ (172800 + 114944 + 124920 + 69966) = ₹ 482630.
Total running cost = ₹ (25 × 5 × 1100 + 10 × 8 × 1100)
= ₹ (137500 + 88000) = ₹ 225500.
∴ Profit = ₹ (482630 − 225500) = ₹ 257130 ≈ ₹ 250000.

93. Clearly, we have:
Profit margin = Total fare collected − Total running cost
Profit margin exhibited by 3 tier
= ₹ [(8 × 72 × 300) − (8 × 10 × 1100)]
= ₹ (172800 − 88000) = ₹ 84800.
Profit margin exhibited by AC − 3 tier
= ₹ [(2 × 64 × 898) − (2 × 25 × 1100)] = ₹ (114944 − 55000)
= ₹ 59944.
Profit margin exhibited by AC − 2 tier
= ₹ [(2 × 45 × 1388) − (2 × 25 × 1100)]
= ₹ (124920 − 55000) = ₹ 69920.
Profit margin exhibited by AC-first class
= ₹ [(1 × 26 × 2691) − (1 × 25 × 1100)]
= ₹ (69966 − 27500) = ₹ 42466.
Clearly, it is the highest for 3 tier.

94. Revenue generated by 3 tier = ₹ (8 × 72 × 300) = ₹ 172800.
Revenue generated by AC-3 tier = ₹ (2 × 64 × 898) = ₹ 114944.
Revenue generated by AC-2 tier = ₹ (2 × 45 × 1388) = ₹ 124920.
Revenue generated by AC-first class = ₹ (1 × 26 × 2691) = ₹ 69966.
Clearly, it is the highest for 3 tier.

95. The profit margin collected by AC-first class is the lowest.
∴ Required percentage = $\left(\frac{42466}{27500} \times 100\right)\% = 154.4\%$.

96. As calculated in Q. 92,
Total profit = ₹ 257130.
Profit from AC bogies = ₹ [(114944 + 124920 + 69966) − 137500] = ₹ (309830 − 137500) = ₹ 172330.
∴ Required percentage = $\left(\frac{172330}{257130} \times 100\right)\% = 67\% \approx 70\%$.

97. (*a*) Profit = ₹ [{(42 − 32.40) × 25} + {(38 − 34.50) × 30}]
= ₹ [(9.6 × 25) + (3.5 × 30)] = ₹ (240 + 105) = ₹ 345.
(*b*) Profit = ₹ [{(37 − 28.60) × 40} + {(40 − 34.50) × 20}]
= ₹ [(8.4 × 40) + (5.5 × 20)] = ₹ (336 + 110) = ₹ 446.
(*c*) Profit = ₹ [{(38 − 34.50) × 20} + {(36 − 32.40) × 20}]
= ₹ [(3.5 × 20) + (3.6 × 20)] = ₹ (70 + 72) = ₹ 142.
(*d*) Profit = ₹ [{(37 − 34.50) × 30} + {(33 − 28.60) × 20}]
= ₹ [(2.5 × 30) + (4.4 × 20)] = ₹ (75 + 88) = ₹ 163.
(*e*) Profit = ₹ [{(40 − 28.60) × 20} + {(38 − 32.40) × 40}]
= ₹ [(11.4 × 20) + (5.6 × 40)] = ₹ (228 + 224) = ₹ 452.
Clearly, the shopkeeper gains the maximum in transaction (*e*).

98. C.P. of 70 kg wheat
= ₹ (30 × 9.50 + 40 × 8.50) = ₹ (285 + 340) = ₹ 625.
S.P. of 70 kg wheat
= ₹ (70 × 8.90) = ₹ 623.
∴ Loss = ₹ (625 − 623) = ₹ 2.

99. C.P. of 40 kg rice
= ₹ (25 × 32 + 15 × 36) = ₹ (800 + 540) = ₹ 1340.
S.P. of 40 kg rice
= ₹ (40 × 40.20) = 1608.
Profit = ₹ (1608 − 1340) = 268.
∴ Profit % = $\left(\frac{268}{1340} \times 100\right)\% = 20\%$.

100. C.P. per kg of first variety = ₹ $\left(\frac{100}{80} \times 3.20\right) =$ ₹ 4.

C.P. per kg of second variety = ₹ $\left(\frac{100}{120} \times 6\right) =$ ₹ 5.

C.P. of 2 kg of sugar = ₹ (4 + 5) = ₹ 9.
S.P. of 2 kg of sugar = ₹ (2 × 5.40) = ₹ 10.80.
Gain = ₹ (10.80 − 9) = ₹ 1.80.
∴ Gain% = $\left(\frac{1.80}{9} \times 100\right)\% = 20\%$.

101. C.P. of 50 kg wheat = ₹ (30 × 11.50 + 20 × 14.25)
= ₹ (345 + 285) = ₹ 630.
S.P. of 50 kg wheat = 130% of ₹ 630 = ₹ $\left(\frac{130}{100} \times 630\right) =$ ₹ 819.
∴ S.P. per kg = ₹ $\left(\frac{819}{50}\right)$ = ₹ 16.38 ≈ ₹ 16.30.

102. Let the required price per kg be ₹ x. Then,
C.P. of 60 kg rice = ₹ (30 × 17.50 + 30 × x) = ₹ (525 + 30x).
S.P. of 60 kg rice = ₹ (60 × 18.60) = ₹ 1116.
∴ $\frac{1116 - (525 + 30x)}{525 + 30x} \times 100 = 20 \iff \frac{591 - 30x}{525 + 30x} = \frac{1}{5}$

$\Leftrightarrow 2955 - 150x = 525 + 30x$

$\Leftrightarrow 180x = 2430$

$\Leftrightarrow x = \left(\frac{2430}{180}\right) = \left(\frac{27}{2}\right) = 13.50$.

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

103. Suppose he bought 5 kg and 4 kg of the two varieties respectively.

C.P. of 9 kg = ₹ (5 × 160 + 4 × 200) = ₹ 1600.

S.P. of 9 kg = ₹ (9 × 192) = ₹ 1728.

$\therefore$ Profit % = $\left(\frac{128}{1600} \times 100\right)\% = 8\%$.

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

C.P. of 9 kg = ₹ (2 × 50 + 4 × 20 + 3 × 30) = ₹ 270.

S.P. of 9 kg = ₹ (9 × 33) = ₹ 297.

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

105. C.P. of 30 kg wheat = ₹ (30 × 45) = ₹ 1350.

Quantity of wheat sold = 40% of 30 kg = 12 kg.

Quantity left = (30 − 12) kg = 18 kg.

For 25% profit, desired S.P. = ₹ $\left(\frac{125}{100} \times 1350\right) =$ ₹ 1687.50.

Money realised by selling 12 kg wheat = ₹ (12 × 50) = ₹ 600.

Balance required = ₹ (1687.50 − 600) = ₹ 1087.50.

$\therefore$ Required price = ₹ $\left(\frac{1087.50}{18}\right)$ per kg

= ₹ 60.41 per kg ≈ ₹ 60 per kg.

106. Suppose he bought 12 kg, 15 kg and 20 kg of the three varieties respectively.

Then, total C.P. = ₹ (12 × 100 + 15 × 80 + 20 × 60)

= ₹ (1200 + 1200 + 1200) = ₹ 3600.

Let the loss on the third quantity be x%.

Then, 120% of 2400 + (100 − x)% of 1200 = 3600

$\Rightarrow \left(\frac{6}{5} \times 24\right) + \left(\frac{100 - x}{100} \times 12\right) = 36$

$\Rightarrow \frac{100 - x}{100} \times 12 = 36 - \frac{144}{5} = \frac{36}{5}$

$\Rightarrow \frac{100 - x}{100} = \frac{36}{5} \times \frac{1}{12} = \frac{3}{5} \Rightarrow 500 - 5x = 300$

$\Rightarrow 5x = 200 \Rightarrow x = 40\%$.

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

By the rule of alligation :

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

0 — 6.40

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

$\frac{64}{110}$ — $\frac{64}{11}$

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

108. Mean cost price = ₹ $\left(\frac{100}{120} \times 3\right) =$ ₹ $\frac{5}{2}$.

By the rule of alligation:

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

0 — 3

Mean price $\frac{5}{2}$

$\frac{1}{2}$ — $\frac{5}{2}$

$\therefore$ Ratio of water and milk = $\frac{1}{2} : \frac{5}{2} = 1 : 5$.

So, required quantity of milk = (5 × 5) litres = 25 litres.

109. Let the cost of the other brand be ₹ x per kg.

C.P. of 5 kg = ₹ (2 × 200 + 3 × x) = ₹ (400 + 3x).

S.P. of 5 kg = ₹ (5 × 177) = ₹ 885.

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

$\Leftrightarrow 24250 - 150x = 3600 + 27x$

$\Leftrightarrow 177x = 20650 \Leftrightarrow x = \left(\frac{350}{3}\right) = 116\frac{2}{3}$.

So, cost of the other brand = ₹ 116.66.

110. Suppose, he must produce x items.

Then, C.P. = ₹ (40x + 3000), S.P. = 60x.

$\therefore$ 60x − (40x + 3000) = 1000 or 20x = 4000 or x = 200.

111. C.P. of 20 kg milk = ₹ (20 × 15) = ₹ 300.

Quantity of water added = 10% of 20 kg = 2 kg.

S.P. of 1 kg mixture = 110% of ₹ 15 = ₹ 16.50.

S.P. of 22 kg mixture = ₹ (22 × 16.50) = ₹ 363.

$\therefore$ Profit = ₹ (363 − 300) = ₹ 63.

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

113. Gain% = $\left(\frac{50}{950} \times 100\right)\% = 5\frac{5}{19}\%$.

114. Let error = x gms.

Then, $\frac{x}{1000 - x} \times 100 = 25 \Leftrightarrow \frac{100x}{1000 - x} = 25$

$\Leftrightarrow 100x = 25000 - 25x \Leftrightarrow 125x = 25000$

$\Leftrightarrow x = 200$.

$\therefore$ Weight used = (1000 − 200) gms = 800 gms.

115. Let error = x gms. Then,

$\frac{x}{1000 - x} \times 100 = 6\frac{18}{47} \Leftrightarrow \frac{100x}{1000 - x} = \frac{300}{47}$

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

$\therefore$ Weight used = (1000 − 60) = 940 gms.

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

$\therefore$ Gain% = $\left[\frac{(100 + 10)^2}{100} - 100\right]\%$

$= \left(\frac{12100 - 10000}{100}\right)\% = 21\%$.

117. Let the C.P. of 1 kg goods be ₹ 1.

Then, he buys 1100 g goods for ₹ 1 and sells 900 g goods for ₹ 1.

∴ C.P. of 1100 g goods = ₹ 1

⇒ C.P. of 900 g goods = ₹ $\left(\frac{1}{1100}\times 900\right)$ = ₹ $\frac{9}{11}$.

S.P. of 900 g goods = ₹ 1.

Gain = ₹ $\left(1-\frac{9}{11}\right)$ = ₹ $\frac{2}{11}$.

∴ Gain% = $\left(\frac{2}{11}\times\frac{11}{9}\times 100\right)\% = \frac{200}{9}\%$.

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

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

Let C.P. of each gm be ₹ 1.

Then, C.P. of this packet = ₹ 800.

S.P. of this packet = 110% of

C.P. of 1 kg = ₹ $\left(\frac{110}{100}\times 1000\right)$ = ₹ 1100.

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

Short cut Method: Using the formula, we have:

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

$= \left(\frac{30}{80}\times 100\right)\% = 37.5\%$.

119. Gain/Loss% = $\left\{\left(\frac{y-x}{100-y}\right)\times 100\right\}\% = \left\{\left(\frac{15-20}{100-15}\right)\times 100\right\}\%$

$= \left(\frac{-5}{85}\times 100\right)\% = -\frac{100}{17}\%$

$= -5\frac{15}{17}\%$.

Since it is –ve, hence it is a loss.

120. Percentage deduction in weight = $\left(\frac{160}{1000}\times 100\right)\% = 16\%$.

∴ Gain/Loss% = $\left[\left(\frac{y-x}{100-y}\right)\times 100\right]\% = \left(\frac{16-4}{100-16}\times 100\right)\%$

$= \left(\frac{12}{84}\times 100\right)\% = \frac{100}{7}\% = 14\frac{2}{7}\%$.

Since it is +ve, hence it is a gain.

121. Let the percentage deduction in weight be y %.

Then, $\frac{y-4}{100-y}\times 100 = 20 \Rightarrow \frac{y-4}{100-y} = \frac{1}{5}$

⇒ $5y - 20 = 100 - y \Rightarrow 6y = 120 \Rightarrow y = 20$.

Hence, for a metre, length used = (100 – 20)% of 1 m = 80% of 100 cm = 80 cm.

122. Let the actual C.P. of 1 m cloth be ₹ 1.

Then, the merchant buys 120 cm cloth for ₹ 1 and sells 80 cm cloth at a discount of 20% on ₹ 1.

So, C.P. of 120 cm cloth = ₹ 1

⇒ C.P. of 80 cm cloth = ₹ $\left(\frac{1}{120}\times 80\right)$ = ₹ $\frac{2}{3}$.

S.P. of 80 cm cloth = 80% of ₹ 1 = ₹ $\frac{4}{5}$.

Profit = ₹ $\left(\frac{4}{5}-\frac{2}{3}\right)$ = ₹ $\frac{2}{15}$.

∴ Profit % = $\left(\frac{2}{15}\times\frac{3}{2}\times 100\right)\% = 20\%$.

123. Let the required gain be x%.

Percentage deduction in weight = $\left(\frac{200}{1000}\times 100\right)\% = 20\%$.

∴ $\frac{20+x}{100-20}\times 100 = 37\frac{1}{2} \Rightarrow \frac{20+x}{80} = \frac{3}{8}$

$\Rightarrow 20 + x = 30 \Rightarrow x = 10$.

Hence, nominal gain percentage = 10%.

124. Let the C.P. of 1 kg of almonds be ₹ 100.

Then, S.P. realised by the merchant on selling a 2 kg pack = ₹ (2 × 80) = ₹ 160.

Profit = $6\frac{2}{3}\%$.

C.P. of each pack

= ₹ $\left(\frac{100}{106\frac{2}{3}}\times 160\right)$ = ₹ $\left(100\times\frac{3}{320}\times 160\right)$ = ₹ 150.

Clearly, the 2 kg pack has 1 kg 500 gm of almonds.

So, other weight = (1 kg 500 gm – 850 gm) = 650 gm.

125. We find the net profit in each case :

(*a*) In this case, profit = 10%.

(*b*) Profit = $\left(\frac{100}{900}\times 100\right)\% = 11\frac{1}{9}\%$.

(*c*) Let C.P. of sugar be ₹ 1 per kg.

Then, he mixes 100 gm impurities and realizes the C.P. of 1.1 kg sugar by selling 1 kg of sugar. *i.e.*, S.P. of sugar = ₹ 1.10 per kg.

∴ Profit = $\left(\frac{0.1}{1}\times 100\right)\% = 10\%$.

(*d*) Let C.P. of sugar be ₹ 1 per kg.

Since he weighs 950 gm instead of a kg, his actual C.P. = ₹ 0.95.

S.P. = 105% of ₹ 1 = ₹ 1.05.

∴ Profit = $\left(\frac{0.10}{0.95}\times 100\right)\% = 10\frac{10}{19}\%$.

Clearly, the maximum profit is earned when he used a 900 gm weight for a kg.

126. Suppose he has 100 items. Let C.P. of each item be ₹ 1.

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

S.P. of each item = ₹ 1.10.

∴ Total sale = ₹ (1.10 × 80) = ₹ 88.

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

127. Let the price paid by Prateek be ₹ x.

Then, 140% of 120% of x = 10500

$$\Rightarrow \frac{140}{100}\times\frac{120}{100}\times x = 10500 \Rightarrow x = \left(10500\times\frac{25}{42}\right) = 6250.$$

128. Let the cost of the article be ₹ x.

Then, cost paid by retail merchant = 95% of 120% of ₹ x

$$= ₹\left(\frac{95}{100}\times\frac{120}{100}\times x\right) = ₹\left(\frac{114}{100}x\right) = 114\% \text{ of } ₹\ x$$

$\therefore$ Gain = 14%.

129. 110% of 90% of 120% of A = 1188

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

$\therefore$ A purchased it for ₹ (1000 – 110) = ₹ 890.

130. Money spent by X = ₹ 150000.

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

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

$\therefore$ X gains ₹ (157500 – 154350) = ₹ 3150.

131. Let the C.P. for the manufacturer be ₹ x.

Then, 95% of 120% of 110% of x = 627

$$\Rightarrow \frac{95}{100}\times\frac{120}{100}\times\frac{110}{100}\times x = 627 \quad \Rightarrow \quad x = 500.$$

132. Let the cost paid by the first trader be ₹ x.

Then, 125% of 125% of 125% of x = 250

$$\Rightarrow \frac{125}{100}\times\frac{125}{100}\times\frac{125}{100}\times x = 250 \Rightarrow x = \left(250\times\frac{64}{125}\right) = 128.$$

133. Let the original cost of the article be ₹ P and the profit percent made by the second be x%.

Then, 120% of (100 + x)% of P = 138% of P

$$\Rightarrow \frac{120}{100}\times\frac{(100+x)}{100} = \frac{138}{100} \quad \Rightarrow \quad \frac{100+x}{100} = \frac{23}{20}$$

$\Rightarrow$ 100 + x = 115 $\Rightarrow$ x = 15.

134. Let the S.P. be ₹ x. Then,

$$x - 10\% \text{ of } x = 27 \Leftrightarrow 90\% \text{ of } x = 27 \Leftrightarrow x = \left(27\times\frac{10}{9}\right) = 30.$$

135. Let the S.P. be ₹ x. Profit = 25%

Then, C.P. = x – 25% of ₹ x = 75% of ₹ x = ₹ $\left(\frac{3}{4}x\right)$.

Profit = ₹ $\left(x - \frac{3}{4}x\right) = ₹\frac{x}{4}$.

$$\therefore \text{ Profit\%} = \left(\frac{x}{4}\times\frac{4}{3x}\times 100\right)\% = 33\frac{1}{3}\%.$$

136. Let C.P. be ₹ x. Then, profit = 20% of ₹ x = ₹ $\frac{x}{5}$.

S.P. = ₹ $\left(x + \frac{x}{5}\right) = ₹\frac{6x}{5}$.

$$\therefore \text{ Desired profit \%} = \left(\frac{x}{5}\times\frac{5}{6x}\times 100\right)\% = 16\frac{2}{3}\%.$$

137. Let Roshan's C.P. = ₹ p.

Profit = 15% of ₹ p = ₹ $\left(\frac{3}{20}p\right)$.

S.P. = ₹ $\left(p + \frac{3}{20}p\right) = ₹\left(\frac{23}{20}p\right)$.

Profit % on S.P. = $\left(\frac{3p}{20}\times\frac{20}{23p}\times 100\right)\% = \left(\frac{300}{23}\right)\%$.

Now, let S.P. of each be ₹ x.

Then, 25% of $x - \frac{300}{23}$% of x = 275

$$\Rightarrow \frac{275}{23}x = 27500 \Rightarrow x = \left(\frac{27500\times 23}{275}\right) = 2300.$$

138. Let C.P. = ₹ x, Profit% = x % and S.P. = ₹ 144.

$$\therefore x = \left[\frac{100}{(100+x)}\times 144\right] \Rightarrow x^2 + 100x = 14400$$

$$\Rightarrow x^2 + 100x - 14400 = 0$$

$\Rightarrow$ x^2 + 180x – 80x – 14400 = 0

$\Rightarrow$ (x + 180) (x – 80) = 0 $\Rightarrow$ x = 80.

139. Let the M.P. be ₹ x.

Then, S.P. = ₹ $\frac{2}{3}x$, Loss = 10%.

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

If an article is sold at M.P., then

Profit = ₹ $\left(x - \frac{20}{27}x\right) = ₹\frac{7x}{27}$.

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

140. Let S.P. be ₹ x. Then, C.P.

= ₹ $\frac{13}{15}x$, Receipt = 112% of ₹ x = ₹ $\frac{28}{25}x$.

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

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

141. Let the article be worth ₹ x.

C.P. = 90% of ₹ x = ₹ $\frac{9x}{10}$;

S.P. = 110% of ₹ x = ₹ $\frac{11x}{10}$.

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

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

142. Let original price = ₹ 100.

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

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

143. Let C.P. be ₹ x.

Then, 5% of x = (350 – 340) = 10 $\Rightarrow \frac{x}{20} = 10 \quad \Rightarrow \quad x = 200.$

144. Let C.P. be ₹ x. Then, 2% of x = (400 − 380) = 20

$\Rightarrow \frac{x}{50} = 20 \Rightarrow x = 1000.$

145. Let C.P. be ₹ x.

Then, $107\frac{1}{2}\%$ of $x - 92\frac{1}{2}\%$ of $x = 3$

$\Rightarrow \frac{215}{200}x - \frac{185}{200}x = 3 \Rightarrow \frac{30x}{200} = 3 \Rightarrow x = 20.$

146. Let C.P. be ₹ x. Then,

$(106\% \text{ of } x) - \left(87\frac{1}{2}\% \text{ of } x\right) = 92.50$

$\Rightarrow 18\frac{1}{2}\% \text{ of } x = 92.50 \Rightarrow x = \left(\frac{92.50 \times 100 \times 2}{37}\right) = 500.$

147. Let C.P. be ₹ x. Then, $\left(107\frac{1}{2}\% \text{ of } x\right) - \left(97\frac{1}{2}\% \text{ of } x\right) = 100$

$\Rightarrow 10\% \text{ of } x = 100 \Rightarrow x = 1000.$

$\therefore$ Desired S.P. = $112\frac{1}{2}\%$ of ₹ 1000

$= ₹ \left(\frac{225}{2} \times \frac{1}{100} \times 1000\right) = ₹ 1125.$

148. Let the C.P. be ₹ 100. Then, profit = 20%. S.P. = ₹ 120.
New C.P. = 20% less = ₹ 80.

If gain is 25% then S.P. = ₹ $\left(\frac{125}{100} \times 80\right) = ₹ 100.$

Difference in S.P. = ₹ (120 − 100) = ₹ 20.
If difference in S.P. is ₹ 20,. then C.P. = ₹ 100.

If difference in S.P. is ₹ 18, then C.P. = ₹ $\left(\frac{100}{20} \times 18\right) = ₹ 90.$

149. Let C.P. of the book be ₹ 100.
Profit = 10%. S.P. = ₹ 110.
New C.P. = 4% less = ₹ 96.

If gain is $18\frac{3}{4}\%$, then S.P. = $\left(118\frac{3}{4}\% \text{ of } ₹ 96\right)$

$= ₹ \left(\frac{475}{4} \times \frac{1}{100} \times 96\right) = ₹ 114.$

Difference in S.P. = ₹ (114 − 110) = ₹ 4.
If difference in S.P. is ₹ 4, C.P. = ₹ 100.

If difference in S.P. is ₹ 6, C.P. = ₹ $\left(\frac{100}{4} \times 6\right) = ₹ 150.$

150. Let C.P. be ₹ x. Profit = 20%. S.P. = 120% of ₹ x = ₹ $\frac{6x}{5}$.

New C.P. = ₹ $(x - 100)$. New S.P. = ₹ $\left(\frac{6x}{5} - 100\right)$.

Profit = ₹ $\left[\left(\frac{6x}{5} - 100\right) - (x - 100)\right] = ₹ \frac{x}{5}.$

$\therefore \frac{x}{5} \times \frac{1}{(x - 100)} \times 100 = 25 \Rightarrow 20x = 25(x - 100)$

$\Rightarrow 5x = 2500 \Rightarrow x = 500.$

151. Let the C.P. be ₹ x. Profit = 20%.

S.P. = ₹ $\left(\frac{120}{100} \times x\right) = ₹ \frac{6x}{5}.$

New C.P. = ₹ $\left(\frac{110}{100} \times x\right) = ₹ \frac{11x}{10}.$

New S.P. = ₹ $\left(\frac{6x}{5} + 26\right).$

New profit = ₹ $\left[\left(\frac{6x}{5} + 26\right) - \frac{11x}{10}\right] = ₹ \left(\frac{x}{10} + 26\right).$

$\therefore \left(\frac{x}{10} + 26\right) \times \frac{10}{11x} \times 100 = 15 \Rightarrow 100\,(x + 260) = 165x$

$\Rightarrow 65x = 26000 \Rightarrow x = 400.$

152. Let the C.P. be ₹ x.

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

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

$\therefore$ S.P. = ₹ $\left(\frac{6}{5} \times 1200\right) = ₹ 1440.$

153. Let C.P. of the article be ₹ x.

Then, Required ratio = $\frac{104\% \text{ of } x}{106\% \text{ of } x} = \frac{104}{106} = \frac{52}{53} = 52 : 53.$

154. Let the two investments be ₹ $3x$ and ₹ $5x$ respectively.
Then, total investment = ₹ $(3x + 5x)$ = ₹ $8x$.
Total output = ₹ (115% of $3x$ + 90% of $5x$)
= ₹ $(3.45x + 4.5x)$ = ₹ $7.95x$.
Loss = ₹ $(8x - 7.95x)$ = ₹ $0.05x$.

$\therefore$ Loss percent = $\left(\frac{0.05x}{8x} \times 100\right)\% = \frac{5}{8}\%.$

155. Let the S.P. of watches w_1, w_2 and w_3 be ₹ $2x$, ₹ $3x$ and ₹ $4x$ respectively.
Gain on watch w_1 = 30%.

C.P. of watch w_1 = ₹ $\left(\frac{100}{130} \times 2x\right) = ₹ \frac{20x}{13}.$

Gain on watch w_2 = 20%.

C.P. of watch w_2 = ₹ $\left(\frac{100}{120} \times 3x\right) = ₹ \frac{5x}{2}.$

Loss on watch w_3 = 40%.

C.P. of watch w_3 = ₹ $\left(\frac{100}{60} \times 4x\right) = ₹ \frac{20x}{3}.$

Total C.P. of three watches = ₹ $\left(\frac{20x}{13} + \frac{5x}{2} + \frac{20x}{3}\right)$

$= ₹ \left(\frac{120x + 195x + 520x}{78}\right) = ₹ \frac{835x}{78}.$

Total S.P. of three watches = ₹ $(2x + 3x + 4x) = 9x$.

Loss = ₹ $\left(\frac{835x}{78} - 9x\right) = ₹ \frac{133x}{78}.$

$\therefore$ Loss% = $\left(\frac{133x}{78} \times \frac{78}{835x} \times 100\right)\%$

$= \left(\frac{2660}{167}\right)\% = 15.93\% \approx 16\%.$

156. Loss% = $\left(\frac{\text{Common Gain \& Loss\%}}{10}\right)^2 \% = \left(\frac{20}{10}\right)^2 \% = 4\%.$

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

$= \left(\frac{12}{10}\right)^2\% = \frac{36}{25}\% = 1\frac{11}{25}\%.$

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

159. Total S.P. = ₹ 8000 and Total C.P. = ₹ 8000.

S.P. of 1st commodity = ₹ 4000.

Gain on it = 25%.

∴ C.P. of 1st commodity

$= ₹\left(\frac{100}{125} \times 4000\right) = ₹\,3200.$

C.P. of 2nd commodity

= ₹ (8000 − 3200) = ₹ 4800.

S.P. of 2nd commodity

= ₹ 4000.

∴ Loss on 2nd commodity

$= \left(\frac{800}{4800} \times 100\right)\% = 16\frac{2}{3}\%.$

160. Total S.P. = ₹ 2 lakh.

C.P. of house $= ₹\left(\frac{100}{80} \times 1\right)\text{lakh} = ₹\,\frac{5}{4}\text{lakh}.$

C.P. of shop $= ₹\left(\frac{100}{120} \times 1\right)\text{lakh} = ₹\,\frac{5}{6}\text{lakh}.$

Total C.P. $= ₹\left(\frac{5}{4} + \frac{5}{6}\right)\text{lakh} = ₹\,\frac{25}{12}\text{lakh}.$

∴ Loss $= ₹\left(\frac{25}{12} - 2\right)\text{lakh} = ₹\,\frac{1}{12}\text{lakh}.$

161. Total S.P. = ₹ (2 × 99) = ₹ 198.

C.P. of first article $= ₹\left(\frac{100}{110} \times 99\right) = ₹\,90.$

C.P. of second article $= ₹\left(\frac{100}{90} \times 99\right) = ₹\,110.$

Total C.P. = ₹ (90 + 110) = ₹ 200.

∴ Loss = ₹ (200 − 198) = ₹ 2.

162. Total S.P. = ₹ (2 × 500) = ₹ 1000.

C.P. of first chair $= ₹\left(\frac{100}{120} \times 500\right) = ₹\,\frac{1250}{3}.$

C.P. of second chair $= ₹\left(\frac{100}{88} \times 500\right) = ₹\,\frac{6250}{11}.$

Total C.P. $= ₹\left(\frac{1250}{3} + \frac{6250}{11}\right) = ₹\left(\frac{32500}{33}\right).$

Gain $= ₹\left(1000 - \frac{32500}{33}\right) = ₹\left(\frac{500}{33}\right).$

∴ Gain % $= \left(\frac{500}{33} \times \frac{33}{32500} \times 100\right)\% = 1.54\% \approx 1.5\%.$

163. Total C.P. = ₹ (120 × 110) = ₹ 13200.

Total S.P. = ₹ [(30 × 110 + 30 × 12) + (75 × 110 + 75 × 14) + (15 × 110 − 15 × 7)] = ₹ 14505.

Average profit $= ₹\left(\frac{14505 - 13200}{120}\right) = ₹\,\frac{1305}{120} = ₹\,10.875.$

164. Total profit required = ₹ (42 × 18) = ₹ 756.

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

Profit on 20 sarees = ₹ (756 − 604) = ₹ 152.

Average profit on these sarees $= ₹\left(\frac{152}{20}\right) = ₹\,7.60.$

165. C.P. of 20 dozen = ₹ (48 × 20) = ₹ 960.

C.P. of 8 dozen = ₹ (48 × 8) = ₹ 384.

C.P. of 12 dozen = ₹ (960 − 384) = ₹ 576.

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

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

166. Let the total C.P. of all the articles be ₹ x.

Then, C.P. of 80% of the articles = 80% of ₹ x = ₹ $\frac{4x}{5}$.

C.P. of the remaining articles $= ₹\left(x - \frac{4x}{5}\right) = ₹\,\frac{x}{5}.$

Total S.P. $= ₹\left(110\%\text{ of }\frac{4x}{5} + 60\%\text{ of }\frac{x}{5}\right) = ₹\left(\frac{22x}{25} + \frac{3x}{25}\right) = ₹\,x.$

Since C.P. = S.P., there is no profit, no loss.

167. Let the C.P. of the whole be ₹ x.

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

Total S.P. $= ₹\left(110\%\text{ of }\frac{x}{4} + 80\%\text{ of }\frac{3x}{4}\right)$

$= ₹\left(\frac{11x}{40} + \frac{3x}{5}\right) = ₹\,\frac{7x}{8}.$

Loss $= ₹\left(x - \frac{7x}{8}\right) = ₹\,\frac{x}{8}.$

∴ Loss% $= \left(\frac{x}{8} \times \frac{1}{x} \times 100\right)\% = 12.5\%.$

168. Total C.P. = ₹ (120 × 3) = ₹ 360.

Total S.P. = ₹ (40 × 4 + 60 × 5 + 20 × 3) = ₹ 520.

Profit = ₹ (520 − 360) = ₹ 160.

∴ Profit% $= \left(\frac{160}{360} \times 100\right)\% = \left(\frac{400}{9}\right)\% = 44\frac{4}{9}\%.$

169. C.P. of each pen $= ₹\left(\frac{9000}{1000}\right) = ₹\,9.$

Pens sold during first month = 75% of 1000 = 750.

S.P. of each pen sold during first month = 180% of ₹ 9

$= ₹\,\frac{81}{5}.$

Pens sold afterwards = 50% of 250 = 125.

S.P. of each pen sold afterwards = 120% of ₹ 9 = ₹ $\frac{54}{5}$.

Total S.P. = $₹\left(750\times\frac{81}{5}+125\times\frac{54}{5}\right)$

$= ₹\,(12150+1350) = ₹\,13500.$

170. Let the C.P. of whole be ₹ x.

Then, C.P. of $\frac{1}{3}$rd goods = ₹ $\frac{x}{3}$,

C.P. of $\frac{3}{5}$th goods = ₹ $\frac{3x}{5}$.

C.P. of remaining goods = $₹\left[x-\left(\frac{x}{3}+\frac{3x}{5}\right)\right] = ₹\,\frac{x}{15}$.

Total S.P. = $₹\left(114\%\text{ of }\frac{x}{3}+117\frac{1}{2}\%\text{ of }\frac{3x}{5}+120\%\text{ of }\frac{x}{15}\right)$

$= ₹\left(\frac{38x}{100}+\frac{141x}{200}+\frac{8x}{100}\right) = ₹\left(\frac{233x}{200}\right)$.

Profit = $₹\left(\frac{233x}{200}-x\right) = ₹\,\frac{33x}{200}$.

$\therefore$ Profit % = $\left(\frac{33x}{200}\times\frac{1}{x}\times100\right)\% = \frac{33}{2}\% = 16.5\%$.

171. Let C.P. of whole be ₹ x.

C.P. of $\frac{1}{2}$ stock = ₹ $\frac{x}{2}$, C.P. of $\frac{1}{4}$ stock = ₹ $\frac{x}{4}$.

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

$= ₹\left(\frac{3x}{5}+\frac{x}{5}+\frac{x}{4}\right) = ₹\,\frac{21x}{20}$.

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

$\therefore$ Gain% = $\left(\frac{x}{20}\times\frac{1}{x}\times100\right)\% = 5\%$.

172. Let C.P. of each clock be ₹ x.

Then, C.P. of 90 clocks = ₹ $90x$.

$\therefore$ [(110% of $40x$) + (120% of $50x$)] − (115% of $90x$) = 40

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

173. Let the investments be $3x$ and $5x$.

Then, total investment = $8x$.

Total receipt = (115% of $3x$ + 90% of $5x$)

$= (3.45x + 4.5x) = 7.95x$.

$\therefore$ Loss = $\left(\frac{0.05x}{8x}\times100\right)\% = \frac{5}{8}\%$.

174. Let the required gain percent be x%.

Then, (110% of 3000) + [(100 + x)% of 3000]

= 125% of 6000

$\Rightarrow \left(\frac{110}{100}\times3000\right)+\left[\frac{(100+x)}{100}\times3000\right] = \frac{125}{100}\times6000$

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

175. Let the quantity sold at 18% profit be x kg and let C.P. per kg be ₹ 1.

Then, quantity sold at 8% profit = $(1000 - x)$ kg.

Total C.P. = ₹ 1000.

Total S.P. = ₹ [108% of $(1000 - x)$ + 118% of x]

$= ₹\left[\frac{27}{25}(1000-x)+\frac{59x}{50}\right] = ₹\left(1080+\frac{x}{10}\right)$.

$\therefore 1080 + \frac{x}{10} = 114\%\text{ of }1000 \Rightarrow 1080+\frac{x}{10} = 1140$

$\Rightarrow \frac{x}{10} = 60 \Rightarrow x = 600$.

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

Total C.P. = ₹ 24.

Total S.P. = ₹ [120% of $(24 - x)$ + 95% of x]

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

$= ₹\left[\frac{6}{5}(24-x)+\frac{19x}{20}\right] = ₹\left(\frac{576-5x}{20}\right)$

$= \frac{264}{10} \Rightarrow 576 - 5x = 528$

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

177. Let the S.P. of the first horse be ₹ x.

Then, S.P. of the second horse = ₹ $(1475 - x)$.

C.P. of first horse = ₹ $(1475 - x)$.

Loss on first horse = 20%.

$\therefore \frac{80}{100}\times(1475-x) = x \Rightarrow 4(1475-x) = 5x$

$\Rightarrow 9x = 5900 \Rightarrow x = \frac{5900}{9}$.

S.P. of second horse = $₹\left(1475-\frac{5900}{9}\right) = ₹\,\frac{7375}{9}$.

C.P. of second horse = $₹\left(\frac{100}{125}\times\frac{7375}{9}\right) = ₹\,\frac{5900}{9}$.

$\therefore$ C.P. of 1st horse = S.P. of 2nd horse

and C.P. of 2nd horse = S.P. of 1st horse.

So, Total C.P. = Total S.P.

Hence, there is neither gain nor loss.

178. Let the total value be ₹ x.

Value of $\frac{2}{3}$rd = ₹ $\frac{2x}{3}$, Value of $\frac{1}{3}$rd = ₹ $\frac{x}{3}$.

Total S.P. = $₹\left[\left(106\%\text{ of }\frac{2x}{3}\right)+\left(97\%\text{ of }\frac{x}{3}\right)\right]$

$= ₹\left(\frac{53x}{75}+\frac{97x}{300}\right) = ₹\left(\frac{309x}{300}\right)$.

$\therefore \frac{309x}{300} - x = 540 \Rightarrow \frac{9x}{300} = 540 \Rightarrow x = \left(\frac{540\times300}{9}\right) = 18000$.

179. Let C.P. of watch be ₹ x.

Then, C.P. of wall clock = ₹ $(390 - x)$.

$\therefore$ (10% of x) + [15% of $(390 - x)$] = 51.50

$\Rightarrow \frac{10}{100}\times x+\frac{15}{100}\times(390-x) = \frac{515}{10}$

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

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

$\therefore$ Difference = ₹ (250 – 140) = ₹ 110.

180. Let C.P. of each horse be ₹ x and C.P. of each cow be ₹ y.

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

And, 10% of $4x$ + 20% of $9y$ = 1880

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

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

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

181. Let C.P. of clock A be ₹ x and that of clock B be ₹ (650 – x). Then, 120% of x = 75% of (650 – x)

$\Rightarrow 650 - x = \frac{120}{75}x = \frac{8}{5}x$

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

$\therefore$ C.P. of A = ₹ 250, C.P. of B = ₹ 400.

182. Let the C.P. of the cow be ₹ x and that of the ox be ₹ y.

Then, 120% of x + 125% of y = 800 $\Rightarrow \frac{6x}{5} + \frac{5y}{4} = 800$

$\Rightarrow 24x + 25y = 16000$ ...(*i*)

And, 125% of x + 120% of y = 820 $\Rightarrow \frac{5x}{4} + \frac{6y}{5} = 820$

$\Rightarrow 25x + 24y = 16400$ ...(*ii*)

Adding (*i*) and (*ii*), we get : $49x + 49y = 32400$

$\Rightarrow x + y = \frac{32400}{49}$ ...(*iii*)

Subtracting (*i*) from (*ii*), we get : $x - y = 400$ ...(*iv*)

Adding (*iii*) and (*iv*), we get :

$2x = \frac{32400}{49} + 400 = \frac{52000}{49} \Rightarrow x = \frac{26000}{49} \approx 530.60.$

Putting $x = \frac{26000}{49}$ in (*iii*), we get:

$y = \frac{32400}{49} - \frac{26000}{49} = \frac{6400}{49} \approx 130.60.$

183. Let the C.P. of the watches be ₹ x and ₹ (840 – x).

$\therefore$ (116% of x) + [88% of (840 – x)] = 840

$\Rightarrow$ $116x + 73920 - 88x = 84000$

$\Rightarrow$ $28x = 10080 \Rightarrow x = 360$.

$\therefore$ Their cost prices are ₹ 360 and ₹ 480.

184. Let C.P. of the chair be ₹ x and that of the table be ₹ y.

Then, 17% of y – 7% of x = 296 $\Rightarrow$ $17y - 7x = 29600$...(*i*)

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

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

$\therefore$ C.P. of table = ₹ 2400.

185. Let the cost of product A be ₹ x and that of product B be ₹ y.

Then, 20% of x = 30% of y $\Rightarrow \frac{x}{5} = \frac{3y}{10} \Rightarrow x = \frac{3y}{2}$ ...(*i*)

And, 15% of x – 15% of y = 6 $\Rightarrow \frac{15}{100}(x - y) = 6$

$\Rightarrow x - y = 40 \Rightarrow \frac{3y}{2} - y = 40$

$\Rightarrow \frac{y}{2} = 40 \Rightarrow y = 80.$

Hence, cost of product B = ₹ 80 million.

186. Let the original cost of the toy be ₹ 100.

Then, original cost of component A = 10% of ₹ 100 = ₹ 10.

Original cost of component B = 20% of ₹ 100 = ₹ 20.

Original S.P. of the toy = 120% of ₹ 100 = ₹ 120.

New cost of component A = 120% of ₹ 10 = ₹ 12.

New cost of component B = 140% of ₹ 20 = ₹ 28.

New price of the toy = ₹ [100 + (12 + 28) – (10 + 20)] = ₹ 110.

New S.P. of the toy = 115% of ₹ 120 = ₹ 138.

Profit = ₹ (138 – 110) = ₹ 28.

$\therefore$ Profit% = $\left(\frac{28}{110} \times 100\right)\% = 25.45\% \approx 25.5\%.$

187. Let the total sales be ₹ x and let the profit in women's shirts average y% of the sales.

Then, 8% of 40% of x + y% of 60% of x = 6% of x

$\Rightarrow \frac{8}{100} \times \frac{40}{100} \times x + \frac{y}{100} \times \frac{60}{100} \times x = \frac{6}{100} \times x$

$\Rightarrow \frac{32}{10} + \frac{6y}{10} = 6 \Rightarrow \frac{6y}{10} = \frac{28}{10} \Rightarrow y = \frac{28}{6} = 4.66.$

$\therefore$ Average profit per sales rupee in women's shirt

= 4.66% of ₹ 1 = ₹ $\left(\frac{4.66}{100}\right) =$ ₹ 0.0466.

188. Let original C.P. be ₹ 100 and original S.P. be ₹ x.

Profit = ₹ (x – 100). Profit% = (x – 100)%.

New C.P. = ₹ 118.

New profit = (x – 100)% of ₹ 118 = ₹ $\left[\frac{59}{50}(x - 100)\right]$.

$\therefore$ $\frac{59}{50}(x - 100) - (x - 100) = 9 \Rightarrow \frac{9}{50}(x - 100) = 9$

$\Rightarrow$ x – 100 = 50.

Hence, earlier profit per article = ₹ 50.

189. Let the total initial cost of production be ₹ 100.

Then, manufacturing cost = ₹ 60, Cost of raw materials = ₹ 40.

Original S.P. = ₹ $\left(100 + \frac{60}{4}\right) =$ ₹ 115.

New cost of raw materials = 130% of ₹ 40 = ₹ 52.

New manufacturing cost = 120% of ₹ 60 = ₹ 72.

New cost of the product = ₹ (52 + 72) = ₹ 124.

New S.P. = 160% of ₹ 115 = ₹ $\left(\frac{160}{100} \times 115\right) =$ ₹ 184.

New profit = ₹ (184 – 124) = ₹ 60.

$\therefore$ New profit % = $\left(\frac{60}{124} \times 100\right)\% = 48.39\%.$

190. Original C.P. of the product = ₹ 8. Original manufacturing cost = ₹ $\left(\frac{3}{4} \times 8\right) =$ ₹ 6.

Original cost of raw material = ₹ (8 – 6) = ₹ 2.

New manufacturing cost = ₹ $\left(\frac{5}{3} \times 6\right) =$ ₹ 10.

New cost of raw material = ₹ $\left(\frac{12}{5} \times 2\right) =$ ₹ $\frac{24}{5}$.

New S.P. of the product $= ₹\left(10+\frac{24}{5}\right)=₹\frac{74}{5}$.

$\therefore$ Desired S.P. = 125% of ₹ $\frac{74}{5}$ $= ₹\left(\frac{125}{100}\times\frac{74}{5}\right)=₹\,18.50$.

191. Let C.P. of pure milk be ₹ 10 per litre.
In 1 litre of the mixture, there is 800 ml milk and 200 ml water.
But the milk vendor measures only 800 ml instead of a litre.
So, quantity of milk in 1 litre mixture that he sells
$= (0.8 \times 800)$ ml $= 640$ ml.
$\therefore$ Actual C.P. of 1 litre = ₹ 6.40.
S.P. of 1 litre = 120% of ₹ 10 = ₹ 12.
Profit = ₹ (12 − 6.40) = ₹ 5.60.
Profit% $= \left(\frac{5.60}{6.40}\times 100\right)\% = 87.5\%$.

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

193. M.P. = ₹ 272000.
Discount = ₹ [(4% of 200000) + (2.5% of 72000)]
= ₹ (8000 + 1800) = ₹ 9800.
$\therefore$ Actual price = ₹ (272000 − 9800) = ₹ 262200.

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

195. C.P. = ₹ 50. M.P. = 108% of ₹ 50 $= ₹\left(\frac{108}{100}\times 50\right)=₹\,54$.
Discount = 10% of ₹ 54 = ₹ 5.40.
$\therefore$ S.P. = ₹ (54 − 5.40) = ₹ 48.60.

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

197. **Group A:** Rate of discount $= \left(\frac{10}{65}\times 100\right)\% = 15.38\%$.

Group B: Rate of discount $= \left(\frac{10}{60}\times 100\right)\% = 16.66\%$.

Group C: Rate of discount $= \left(\frac{10}{70}\times 100\right)\% = 14.29\%$.

Group D: Rate of discount $= \left(\frac{10}{75}\times 100\right)\% = 13.33\%$.

198. Let the original S.P. of the watch be ₹ x.
Then, 75% of x = 780 $\Rightarrow x = \left(\frac{780\times 100}{75}\right)=1040$.

199. Let the original S.P. of the perfume be ₹ x.
Then, 85% of x = 3675.40 $\Rightarrow x = \left(\frac{3675.40\times 100}{85}\right)=4324$.

200. S.P. of each article $= ₹\left(\frac{37.40}{2}\right)=₹\,18.70$.
Let M.P. be ₹ x.
Then, 85% of x = 18.70 $\Rightarrow \quad x=\left(\frac{18.70\times 100}{85}\right)=22$.

201. Let the labelled price be ₹ x.
88% of 80% of x = 704 $\Rightarrow \quad x=\left(\frac{704\times 100\times 100}{88\times 80}\right)=1000$.

202. S.P. after 1st discount $= ₹\left(\frac{80}{100}\times 1500\right)=₹\,1200$.
Net S.P. = ₹ 1104. Discount on ₹ 1200 = ₹ 96.
$\therefore$ Required discount $= \left(\frac{96}{1200}\times 100\right)\% = 8\%$.

203. Let the costs of the two articles be x and y.
Then, 15% of x = 20% of $y \Rightarrow \frac{x}{y}=\frac{20}{15}=\frac{4}{3}$.
So, x and y must be in the ratio of 4 : 3.

204. Let the list price be ₹ x.
Then, $\frac{80}{100}x = 24 \Rightarrow x = \frac{24\times 100}{80} = 30$.
$\therefore$ Required S.P. = 70% of ₹ 30 = ₹ 21.

205. Let the list price be ₹ z.
$\therefore$ $(100-x)\%$ of $z = y \Rightarrow \left(\frac{100-x}{100}\right)\times z = y$
$\Rightarrow z=\left(\frac{100y}{100-x}\right)$.

206. Let the marked price be ₹ x.
Then, 7% of x − 5% of x = 15 $\Rightarrow$ 2% of x = 15
$\Rightarrow x = \left(\frac{15\times 100}{2}\right)=750$.

207. Let the labelled price be ₹ x. Then,
(80% of x) − (75% of x) = 500
$\Rightarrow$ 5% of x = 500 $\Rightarrow \quad x=\left(\frac{500\times 100}{5}\right)=10000$.

208. Let the discount on ₹ 6000 be x%.
Then, $(100-x)\%$ of 6000
= 93% of 36000 − (92% of 20000 + 95% of 10000)
= 33480 − (18400 + 9500) = 5580.
$\Rightarrow (100-x) = \frac{5580\times 100}{6000} = 93$
$\Rightarrow x = 7$.

209. When discount = 10%, S.P. = 90% of ₹ 15000 = ₹ 13500.
Profit = 8%.
$\therefore$ C.P. $= ₹\left(\frac{100}{108}\times 13500\right)=₹\,12500$.

210. Let marked price be ₹ 100.
Then, Final S.P. = 70% of 80% of ₹ 100
$= ₹\left(\frac{70}{100}\times\frac{80}{100}\times 100\right)=₹\,56$.
$\therefore$ Single discount = (100 − 56)% = 44%.

211. Let marked price be ₹ 100.
Then, S.P. = 85% of 88% of 90% of ₹ 100
$= ₹\left(\frac{85}{100}\times\frac{88}{100}\times\frac{90}{100}\times 100\right)=₹\,67.32$.
$\therefore$ Single discount = (100 − 67.32)% = 32.68%.

212. Let marked price be ₹ 100.
Then, S.P. = $(100-q)\%$ of $(100-p)\%$ of ₹ 100

$= ₹\left[\frac{100-q}{100}\times\frac{100-p}{100}\times 100\right] = ₹\left[\frac{(100-q)(100-p)}{100}\right]$

$\therefore$ Single discount $= \left\{100-\left[\frac{(100-q)(100-p)}{100}\right]\right\}\%$

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

213. Let marked price be ₹ 100.

Then, S.P. = 80% of 80% of 80% of ₹ 100

$= ₹\left(\frac{80}{100}\times\frac{80}{100}\times\frac{80}{100}\times 100\right) = ₹\,51.20.$

$\therefore$ Single discount = (100 − 51.20)% = 48.8%.

214. S.P. = 88% of 90% of ₹ 250 $= ₹\left(\frac{88}{100}\times\frac{90}{100}\times 250\right) = ₹\,198.$

215. S.P. = 95% of 95% of ₹ 80 $= ₹\left(\frac{95}{100}\times\frac{95}{100}\times 80\right) = ₹\,72.20.$

216. C.P. of the article = ₹ [(95% of 80% of 25000) + 1000]

$= ₹\left[\left(\frac{95}{100}\times\frac{80}{100}\times 25000\right)+1000\right]$

= ₹ 20000.

S.P. of the article = ₹ 25000.

$\therefore$ Gain% $= \left(\frac{5000}{20000}\times 100\right)\% = 25\%.$

217. Price paid by the customer = 85% of 75% of 90% of ₹ 400

$= ₹\left(\frac{85}{100}\times\frac{75}{100}\times\frac{90}{100}\times 400\right) = ₹\,229.50 \approx ₹\,230.$

218. Let M.P. be ₹ x.

Then, 85% of x = 17000 $\Rightarrow x = \left(\frac{17000\times 100}{85}\right) = 20000.$

$\therefore$ Required S.P. = 90% of 95% of ₹ 20000

$= ₹\left(\frac{90}{100}\times\frac{95}{100}\times 20000\right) = ₹\,17100.$

219. Let the original price be ₹ x. Then,

95% of 88% of x = 209 $\Rightarrow \quad x = \left(\frac{209\times 100\times 100}{95\times 88}\right) = 250.$

220. S.P. in 1st case = 60% of ₹ 100000 = ₹ 60000.

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

$= ₹\left(\frac{96}{100}\times\frac{64}{100}\times 100000\right) = ₹\,61440.$

$\therefore$ Difference = ₹ (61440 − 60000) = ₹ 1440.

221. Let the M.P. of the item at each of the stores A and B be ₹ 100.

Final price at A = 90% of 90% of 90% of ₹ 100

$= ₹\left(\frac{90}{100}\times\frac{90}{100}\times\frac{90}{100}\times 100\right) = ₹\,72.90.$

Final price at B = 81% of 90% of ₹ 100

$= ₹\left(\frac{81}{100}\times\frac{90}{100}\times 100\right) = ₹\,72.90.$

Hence, the price of the article is same at A and B.

222. Let the M.P. be ₹ x.

Then, (90% of 80% of x) − (70% of x) = 72

$\Rightarrow \left(\frac{90}{100}\times\frac{80}{100}\times x\right)-\left(\frac{70}{100}\times x\right) = 72$

$\Rightarrow \frac{72}{100}x-\frac{70}{100}x = 72 \Rightarrow \frac{2}{100}x = 72$

$\Rightarrow x = \left(\frac{72\times 100}{2}\right) = 3600.$

223. Loss = ₹ [(92% of 92% of 900) − (84% of 900)]

$= ₹\left[\left(\frac{92}{100}\times\frac{92}{100}\times 900\right)-\left(\frac{84}{100}\times 900\right)\right]$

= ₹ (761.76 − 756) = ₹ 5.76.

224. S.P. in 1st case = 94% of 70% of ₹ 700

$= ₹\left(\frac{94}{100}\times\frac{70}{100}\times 700\right) = ₹\,460.60.$

S.P. in 2nd case = 84% of 80% of ₹ 700

$= ₹\left(\frac{84}{100}\times\frac{80}{100}\times 700\right) = ₹\,470.40.$

$\therefore$ Difference = ₹ (470.40 − 460.60) = ₹ 9.80.

225. Let the M.P. of an article be ₹ 100. We may calculate the final price of this article under each of the three offers:

(*i*) Final price = 85% of 75% of ₹ 100

$= ₹\left(\frac{85}{100}\times\frac{75}{100}\times 100\right) = ₹\,63.75$

(*ii*) Final price = 90% of 70% of ₹ 100

$= ₹\left(\frac{90}{100}\times\frac{70}{100}\times 100\right) = ₹\,63.$

(*iii*) Final price = 95% of 65% of ₹ 100

$= ₹\left(\frac{95}{100}\times\frac{65}{100}\times 100\right) = ₹\,61.75.$

The final price is lowest in (*iii*). So, it is the best offer.

226. Final price in 1st case

= 70% of 90% of 90% of ₹ 10000

$= ₹\left(\frac{70}{100}\times\frac{90}{100}\times\frac{90}{100}\times 10000\right) = ₹\,5670.$

Final price in 2nd case

= 95% of 95% of 60% of ₹ 10000

$= ₹\left(\frac{95}{100}\times\frac{95}{100}\times\frac{60}{100}\times 10000\right) = ₹\,5415.$

$\therefore$ Money saved by choosing the better offer

= ₹ (5670 − 5415) = ₹ 255.

227. Let M.P. be ₹ x.

S.P. in 1st case = 85% of 85% of 90% of ₹ x

$= ₹\left(\frac{85}{100}\times\frac{85}{100}\times\frac{90}{100}\times x\right) = ₹\left(\frac{65025}{100000}x\right).$

Profit = 30.05%.

$\therefore$ C.P. $= ₹\left(\frac{100}{130.05}\times\frac{65025}{100000}x\right) = ₹\,\frac{x}{2}.$

S.P. in 2nd case = 85% of 90% of ₹ x

$= ₹\left(\frac{85}{100}\times\frac{90}{100}\times x\right) = ₹\left(\frac{765x}{1000}\right).$

Profit = ₹$\left(\frac{765x}{1000}-\frac{x}{2}\right)$ = ₹$\left(\frac{265x}{1000}\right)$.

Profit% = $\left(\frac{265x}{1000}\times\frac{2}{x}\times 100\right)\% = 53\%$.

228. Let the second discount rate be x%.

Then, $(100 - x)$% of 90% of 450 = 344.25

$\Rightarrow \quad \frac{100-x}{100}\times\frac{90}{100}\times 450 = 344.25$

$\Rightarrow \quad (100-x) = \left(\frac{34425}{9\times 45}\right) = 85 \quad \Rightarrow \quad x = 15.$

$\therefore$ Second discount rate = 15%.

229. Let the second discount rate be x%.

Then, $(100 - x)$% of 80% of 820 = 570.72

$\Rightarrow \quad \frac{(100-x)}{100}\times\frac{80}{100}\times 820 = 570.72$

$\Rightarrow \quad (100-x) = \left(\frac{57072}{8\times 82}\right) = 87 \quad \Rightarrow \quad x = 13.$

$\therefore$ Second discount rate = 13%.

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

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

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

231. Let the original price of the commodity be ₹ 100.

Increased price = ₹ 110.

Price after discount

= 85% of ₹ 110 = ₹$\left(\frac{85}{100}\times 110\right)$ = ₹ 93.50.

$\therefore$ Discount on original price = (100 – 93.5)% = 6.5%.

232. Let the original price of the camera be ₹ 100.

Discounted price = ₹ 80. Profit = 40%.

$\therefore$ S.P. = 140% of ₹ 80 = ₹$\left(\frac{140}{100}\times 80\right)$ = ₹ 112.

So, profit percentage on original price = (112 – 100)% = 12%.

233. Let C.P. = ₹ 100. Then, marked price = ₹ 120.

S.P. = 90% of ₹ 120 = ₹$\left(\frac{90}{100}\times 120\right)$ = ₹ 108.

$\therefore$ Profit% = (108 – 100)% = 8%.

234. Let C.P. be ₹ 100. Then, marked price = ₹ 125.

S.P. = 84% of ₹ 125 = ₹$\left(\frac{84}{100}\times 125\right)$ = ₹ 105.

$\therefore$ Profit% = (105 – 100)% = 5%.

235. Let C.P. be ₹ 100. Then, marked price = ₹ 130.

S.P. = $\left(100-\frac{25}{4}\right)\%$ of ₹ 130 = ₹$\left(\frac{375}{400}\times 130\right)$ = ₹ 121.875.

$\therefore$ Profit% = (121.875 – 100)% = 21.875% = $\frac{21875}{1000}\% = 21\frac{7}{8}\%$.

236. Let the printed price be ₹ 100.

S.P. = 90% of ₹ 100 = ₹ 90.

C.P. = ₹$\left(\frac{100}{112}\times 90\right)$ = ₹ $\frac{4500}{56}$.

$\therefore$ C.P. : Printed price = $\frac{4500}{56} : 100 = 45 : 56$.

237. S.P. = ₹ X. Profit = 10%.

C.P. = ₹$\left(\frac{100}{110}\times X\right)$ = ₹ $\frac{10X}{11}$.

M.P. = ₹ 2X, Discount = 20%.

S.P. at trade fair = 80% of ₹ 2X = ₹$\left(\frac{80}{100}\times 2X\right)$ = ₹ $\frac{8X}{5}$.

Profit = ₹$\left(\frac{8X}{5}-\frac{10X}{11}\right)$ = ₹ $\frac{38X}{55}$.

$\therefore$ Profit % = $\left(\frac{38X}{55}\times\frac{11}{10X}\times 100\right)\% = 76\%$.

238. Let the original price be ₹ 100.

Then, marked price = ₹ 130.

Final price = 90% of 90% of ₹ 130

= ₹$\left(\frac{90}{100}\times\frac{90}{100}\times 130\right)$ = ₹ 105.30.

$\therefore$ Increase in price = (105.30 – 100)% = 5.3%.

239. Let the marked price of each article be ₹ 1.

Then, C.P. of 30 = ₹ 27, S.P. of 30 = ₹ 30.

$\therefore$ Gain% = $\left(\frac{3}{27}\times 100\right)\% = 11\frac{1}{9}\%$.

240. Marked price = ₹ 300. C.P. = ₹$\left(\frac{100}{120}\times 300\right)$ = ₹ 250.

Sale price = 90% of ₹ 300 = ₹ 270.

$\therefore$ Required gain% = $\left(\frac{20}{250}\times 100\right)\% = 8\%$.

241. Let marked price = ₹ 100.

Then, C.P. = ₹ 64. S.P = ₹ 88.

$\therefore$ Gain% = $\left(\frac{24}{64}\times 100\right)\% = 37.5\%$.

242. Let the marked price be ₹ x.

Then, 108% of 90% of x = 680.40

$\Rightarrow \quad \frac{108}{100}\times\frac{90}{100}x = 680.40 \quad \Rightarrow \quad x = \left(\frac{68040\times 100}{108\times 90}\right) = ₹\ 700.$

243. Let C.P. = ₹ 100. Then, S.P. = ₹ 120.

Let marked price be ₹ x.

Then, 90% of x = 120 $\Rightarrow \quad x = \left(\frac{120\times 100}{90}\right) = 133\frac{1}{3}$.

$\therefore$ Marked price = $33\frac{1}{3}\%$ above C.P.

244. Let C.P. = ₹ 100.

Then, S.P. = ₹ 120.

Let M.P. be ₹ x.

Then, $93\frac{3}{4}\%$ of 80% of $x = 120$

$\Rightarrow \quad \frac{375}{4} \times \frac{1}{100} \times \frac{80}{100} \times x = 120$

$\Rightarrow \frac{3}{4}x = 120 \Rightarrow x = \left(\frac{120 \times 4}{3}\right) = 160.$

$\therefore$ Marked price = 60% above C.P.

245. C.P. = ₹ 4900. S.P. = 110% of ₹ 4900 = ₹ $\left(\frac{110}{100} \times 4900\right)$ = ₹ 5390.

Let marked price be ₹ x.

Then, $87\frac{1}{2}\%$ of x = 5390 $\Rightarrow \left(\frac{175}{2} \times \frac{1}{100} \times x\right) = 5390$

$\Rightarrow x = \left(\frac{5390 \times 8}{7}\right) = 6160.$

$\therefore$ Marked price = ₹ 6160.

246. Let cost price = ₹ 100. Then,

$\frac{2}{5}$ of Marked Price = 75

$\Rightarrow$ Marked Price = ₹ $\left(\frac{75 \times 5}{2}\right)$ = ₹ $\left(\frac{375}{2}\right)$.

$\therefore$ Required ratio = $\frac{375}{2} : 100 = 375 : 200 = 15 : 8.$

247. Clearly, the distributor sold (3500 – 500 *i.e.*, 3000 cassettes. Out of these, in every 30 cassettes, 1 was given free.

$\therefore$ Total number of cassettes given free

= $\left(\frac{3000}{30} + 500\right) = 600.$

Number of cassettes sold = (3500 – 600) = 2900.

S.P. of 1 cassette = 75% of ₹ 150 = ₹ $\left(\frac{75}{100} \times 150\right)$ = ₹ 112.50.

Money realised from sale of cassettes
= ₹ (112.50 × 2900) = ₹ 326250.
Total money invested = ₹ 350000.
Loss = ₹ (350000 – 326250) = ₹ 23750.

Loss% = $\left(\frac{23750}{350000} \times 100\right)\% = 6.78\% \approx 6.8\%.$

248. Let the C.P. of each article be ₹ 100.
Then, C.P. of 16 articles = ₹ (100 × 16) = ₹ 1600.

S.P. of 15 articles = ₹ $\left(1600 \times \frac{135}{100}\right)$ = ₹ 2160.

S.P. of each article = ₹ $\frac{2160}{15}$ = ₹ 144.

If S.P. is ₹ 96, marked price = ₹ 100.

If S.P. is ₹ 144, marked price = ₹ $\left(\frac{100}{96} \times 144\right)$ = ₹ 150.

$\therefore$ Marked price = 50% above C.P.

249. Let C.P. = ₹ 100.
Then, Marked Price = ₹ 110, S.P. = ₹ 99.

$\therefore$ Discount% = $\left(\frac{11}{110} \times 100\right)\% = 10\%.$

250. Let C.P. = ₹ 100.
Then, Marked Price = ₹ 135, S.P. = ₹ 108.

$\therefore$ Discount% = $\left(\frac{27}{135} \times 100\right)\% = 20\%.$

251. Let C.P. of whole stock = ₹ 100.
Then, Marked Price of whole stock = ₹ 120.

M.P. of $\frac{1}{2}$ stock = ₹ 60, M.P. of $\frac{1}{4}$ stock = ₹ 30.

$\therefore$ Total S.P. = ₹ [60 + (80% of 30) + (60% of 30)]
= ₹ (60 + 24 + 18) = ₹ 102.

Hence, gain% = (102 – 100)% = 2%.

252. Since the marked price is not given, so the cost price cannot be determined.

253. S.P. = 80% of ₹ 50 = ₹ $\left(\frac{80}{100} \times 50\right)$ = ₹ 40. Profit = 25%.

$\therefore$ C.P. = ₹ $\left(\frac{100}{125} \times 40\right)$ = ₹ 32.

254. S.P. = 95% of ₹ 6500 = ₹ $\left(\frac{95}{100} \times 6500\right)$ = ₹ 6175.

Profit = 15%.

$\therefore$ C.P. = ₹ $\left(\frac{100}{115} \times 6175\right)$ = ₹ 5369.56 ≈ ₹ 5350.

255. Let the labelled price be ₹ x.

Then, 120% of x = 2880 $\Rightarrow x = \left(\frac{2880 \times 100}{120}\right) = 2400.$

$\therefore$ C.P. = 85% of ₹ 2400 = ₹ $\left(\frac{85}{100} \times 2400\right)$ = ₹ 2040.

256. Marked price = ₹ 30.

S.P. = ₹ $\left[\left(\frac{85}{100} \times 30\right) - 1.50\right]$ = ₹ (25.50 – 1.50) = ₹ 24.

Let C.P. be ₹ x. Then, 120% of x = 24 $\Rightarrow x = \left(\frac{24 \times 100}{120}\right)$ = ₹ 20.

257. Let the marked price be ₹ 100.

Then, S.P. = ₹ $\left(\frac{90}{100} \times 100\right)$ = ₹ 90. Gain = 20%.

$\therefore$ C.P. = ₹ $\left(\frac{100}{120} \times 90\right)$ = ₹ 75.

New commission = ₹ 20; New S.P. = ₹ 80.

$\therefore$ New Profit = $\left(\frac{5}{75} \times 100\right)\% = 6\frac{2}{3}\%.$

258. S.P. = ₹ 340. Let marked price be ₹ x.

Then, 85% of x = 340 $\Rightarrow x = \left(\frac{340 \times 100}{85}\right) = 400.$

C.P. = ₹ $\left(100 \times \frac{3}{340} \times 340\right)$ = ₹ 300.

Now, C.P. = ₹ 300. S.P. = ₹ 400.

$\therefore$ Required profit % = $\left(\frac{100}{300} \times 100\right)\% = 33\frac{1}{3}\%.$

259. S.P. = ₹ 25935. Let marked price be ₹ x.

Then, 91% of x = 25935 $\Rightarrow x = \left(\frac{25935 \times 100}{91}\right) = 28500.$

C.P. = ₹$\left(\frac{100}{103.74}\times 25935\right)$ = ₹ 25000.

Now C.P. = ₹ 25000, S.P. = ₹ 28500.

Profit = ₹ (28500 – 25000) = ₹ 3500.

∴ Required profit% = $\left(\frac{3500}{25000}\times 100\right)\% = 14\%$.

260. S.P. of 1 article = ₹ 45. Let marked price of each article be ₹ x.

Then, $\frac{90}{100}x = 45 \Rightarrow x = ₹\left(\frac{45\times 100}{90}\right) = ₹\ 50$.

C.P. = ₹$\left(\frac{100}{150}\times 45\right) = ₹\ 30$.

When no discount is given, C.P. = ₹ 30, S.P. = ₹ 50.

∴ Required profit% = $\left(\frac{20}{30}\times 100\right)\% = 66\frac{2}{3}\%$.

261. S.P. of 1 saree = ₹ 266.

Let the labelled price of each saree be ₹ x.

Then, $\frac{95}{100}x = 266 \Rightarrow x = ₹\left(\frac{266\times 100}{95}\right) = ₹\ 280$.

Now, S.P. = ₹ 280, Profit = 12%.

∴ C.P. of 1 saree = ₹$\left(\frac{100}{112}\times 280\right) = ₹\ 250$.

262. Let the marked price of the shirt and trousers be ₹ x and ₹ $2x$ respectively.

Let the discount offered on trousers be y%.

Then, S.P. of shirt = 60% of ₹ x = ₹ $\left(\frac{60}{100}\times x\right) = ₹\ \frac{3x}{5}$.

S.P. of trousers = $(100 - y)$% of ₹ $2x$

= ₹$\left[\frac{(100-y)}{100}\times 2x\right] = ₹\left[\frac{(100-y)x}{50}\right]$.

Combined S.P. of shirt and trousers = 70% of ₹ $(x + 2x)$

= ₹ $\left(\frac{70}{100}\times 3x\right) = ₹\ \frac{21x}{10}$.

∴ $\frac{3x}{5} + \frac{(100-y)x}{50} = \frac{21x}{10} \Rightarrow \frac{130-y}{50} = \frac{21}{10}$

$\Rightarrow 1300 - 10y = 1050 \Rightarrow y = 25$.

263. Let C.P. = ₹ 100 and Profit = x%.

Then, S.P. = ₹ $(100 + x)$.

Now, discount = $\frac{1}{5}\times$ S.P. So,

M.P. = (S.P. + discount) = $\frac{6}{5}$ S.P.

Discount% = Profit % $\Rightarrow \frac{\frac{1}{5}S.P.}{\frac{6}{5}S.P.}\times 100 = x \Rightarrow x = \frac{50}{3}$.

Discount = $\frac{1}{5}\times$ S.P. = ₹$\left[\frac{1}{5}(100+x)\right] = ₹\left[\frac{1}{5}\left(100+\frac{50}{3}\right)\right]$

= ₹$\left(\frac{1}{5}\times\frac{350}{3}\right) = ₹\left(\frac{70}{3}\right)$.

∴ Required ratio = $\frac{70}{3}:100 = \frac{7}{3}:10 = 7:30$.

264. C.P. = ₹ 320, Profit = 15%.

S.P. = ₹$\left(\frac{115}{100}\times 320\right) = ₹\ 368$.

Marked price = ₹ (368 + 32) = ₹ 400.

∴ Required profit% = $\left(\frac{80}{320}\times 100\right)\% = 25\%$.

265. Let C.P. be ₹ 100. Then, S.P. = ₹ 123.50.

Let marked price be ₹ x.

Then, $\frac{95}{100}x = 123.50 \Rightarrow x = ₹\left(\frac{12350}{95}\right) = ₹\ 130$.

Now, S.P. = ₹ 130, C.P. = ₹ 100.

∴ Profit% = 30%.

266. Let original list price = ₹ 100.

Then, C.P. = ₹ 75. Desired S.P. = ₹ 125.

∴ Required percentage = $\left(\frac{50}{75}\times 100\right)\% = 66.67\%$.

267. Let the original price be ₹ 100.

Then, C.P. = ₹ 80.

S.P. = 140% of ₹ 80 = ₹$\left(\frac{140}{100}\times 80\right) = ₹\ 112$.

∴ Required percentage = (112 – 100)% = 12%.

268. C.P. = ₹$\left(\frac{100}{125}\times 8750\right) = ₹\ 7000$.

Let the labelled price be ₹ x.

Then $\frac{70}{100}x = 7000 \Rightarrow x = ₹\left(\frac{7000\times 100}{70}\right) = ₹\ 10000$.

269. Let the C.P. of each article be ₹ 100 and the number of pieces sold be x.

Then, original S.P. = ₹ 125.

Original profit = ₹ $[(125 - 100)x]$ = ₹ $25x$.

New C.P. = ₹ 95.

New S.P. = 92% of ₹ 125 = ₹$\left(\frac{92}{100}\times 125\right) = ₹\ 115$.

Number of articles sold now = 1.25 x.

New profit = ₹ $[1.25x\ (115 - 95)]$ = ₹ $25x$.

Hence, the profit remains unchanged.

270. Let the marked price of the time be ₹ 100 x

Discount % = 20%

Changes for delivery and packaging

= 10% on discounted Price

Then, $100x \xrightarrow{-20\%} 80x \xrightarrow{+10\%} 88x$

∴ $88x + 88x\times\frac{25}{100} - 88x = 2046$

$\Rightarrow 110x - 88x = 2046 \Rightarrow 22x = 2046$

$\Rightarrow x = 93$

Hence, $100x = 93 \times 100 = 9300$

∴ Marked price = ₹ 9300

271. Cost price of box = Rs 75

Gain % = 8%

Now, required selling price or S.P.

= (108% of ₹ 75)

$= ₹ \left(\frac{75\times108}{100}\right)$

= ₹ 81

272. Let, the (LCM of 5 and 6) = 30 oranges be bought.

∴ C.P. of 30 oranges

$= \frac{10}{5}\times30 = ₹\ 60$

Their S.P. $= \frac{15}{6}\times30 = ₹\ 75$

Profit = Rs (75 – 60) = Rs 15

∴ Profit percent

$= \left(\frac{15}{60}\right)\times100 = 25\%$

273. Cost Price of two articles A and B = ₹ 8000

The cost price of B = $\frac{20}{32}\times8000 = 5000$

The cost price of $A = \frac{12}{32}\times8000 = 3000$

Since, he sold article A at 20% profit,

Hence, selling price of A = $\left(CP\times\frac{(100+\text{gain}\%)}{100}\right)$

$= 3000\times\frac{120}{100}$

= ₹ 3600

Since article B sold at 12% loss,

Hence, selling price of article B

$= \left(CP\times\frac{(100-\text{loss}\%)}{100}\right)$

$= \frac{5000\times88}{100}$

= ₹ 4400

Dhar wants to make an overall profit of 25%

Total sale price of both article = 8000 + $\frac{8000\times25}{100} = 10000$

Sale price of article B = ₹ (10000 – 3600) = ₹ 6400

274. Let the cost price be ₹ 100.

CP	MP			SP
100	140	20% of discount $= \frac{20\times140}{100} = 28$ ₹ (140 – 28) = ₹ 112	25% of discount $= \frac{25\times112}{100} = 28$ ₹ (112 – 28) = ₹ 84	₹ 84

Loss = 100 – 84 = 16%

∵ If ₹ 16 loss, cost price ₹ 100.

∴ If ₹ 448 loss, cost price = $\frac{100}{16}\times448$

= 28 × 100 = ₹ 2800

∴ Selling price = $\frac{2800\times84}{100}$ = ₹ 2352

275. Let CP of article be ₹ 100

∴ Marked price = ₹ 110

Discount % on marked Price = 10%

S.P. = $\frac{110\times90}{100}$ = ₹ 99 i.e., 1% loss

276. C.P. of article

$= ₹ \left(\frac{5520+4080}{2}\right)$

$= ₹\ \frac{9600}{2} = ₹4800$

When S.P. = ₹ 6000 then

Profit = ₹ (6000 – 4800) = ₹ 1200

∴ Profit per cent = $\frac{1200}{4800}\times100 = 25\%$

277. Marked Price of machine = ₹ 22000

Selling price = $₹ \left(22000-\frac{8\times22000}{100}\right)$ = ₹ 20240

Profit = $22\frac{2}{3}\% = \frac{68}{3}\%$

Let cost price of machine be ₹ x

$x + \frac{68}{3}\%$ of x = ₹ 20240

$\Rightarrow x + \frac{68x}{300} = ₹20240$

$\Rightarrow \frac{368x}{300} = ₹20240$

$\Rightarrow x = ₹ \left(\frac{20240\times300}{368}\right)$ = ₹ 16500

Profit % when machine was sold without discount

$= \frac{22000-16500}{16500}\times100$

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

278. The cost price of the item is ₹ X

And SP = ₹ Y.

Given, Y = ₹ 1.2X

If the cost price of the item is 15% less

Then, CP = 0.85 × X = ₹ 0.85 X

According to the questions,

$0.85X\times\frac{130}{100} = 1.2X - 76$

$\frac{85X}{100}\times\frac{130}{100} = \frac{12X}{10} - 76$

$\frac{11050}{10000} = \frac{12X}{10} - 76$

11.05X = 12X – 760

0.95X = 760

∴ X = $\frac{760}{0.95}$ = ₹ 800

∴ Cost price of the item ₹ 800

279. Let Quantity of rice sold at 20% loss be x kg

∴ Quantity of rice sold at 15% gain = (600 – x) kg

On the whole transaction he incurs an overall Loss of 6%

According to the question,

$(600 - x) \times \frac{115}{100} + \frac{x \times 80}{100}$

$= \frac{600 \times 94}{100}$

$\Rightarrow 115 \times 600 - 115x + 80x$

$= 600 \times 94$

$\Rightarrow 69000 - 35x = 56400$

$\Rightarrow 35x = 12600$

$\Rightarrow x = \frac{12600}{35}$

$= 360$ kg

280. Sale price of an article is ₹ 696 When profit = P%

Sale price of an article is ₹ 841 when Profit = P + 25%

Difference in sale price

= ₹ (841 – 696)

= ₹ 145

Difference of profit percentages = P + 25% – p = 25%

$\therefore$ Let the C.P of article be ₹ x, then,

25% of x = 145

$\Rightarrow x \times \frac{25}{100} = ₹ 145$

$\Rightarrow x = \frac{145 \times 100}{25} = ₹ 580$

$\therefore$ Profit = Sale price – Cost price = ₹ (696 – 580) = ₹ 116

Profit = p%

$\therefore 580 \times \frac{p}{100} = 116$

$\Rightarrow p = \frac{116 \times 100}{580} = 20\%$

281. VAT % = 13.5%

Cost price (including VAT) = ₹ 6810

$\therefore$ List price = $\frac{6810}{113.5} \times 100 =$ ₹ 6000

282. Let the cost price of a article be x.

Then, loss = (6800 – x)

Again, profit = (7850 – x)

According to given information we get

Now, $(7850 - x) = \frac{(6800 - x)}{2}$

$15700 - 2x = 6800 - x$

$x = 15700 - 6800 = 8900$

If profit % = 20% then

$\therefore$ Selling price = $\frac{8900 \times 120}{100}$ = ₹ 10680

283. Let marked price of article be ₹ x

According to the question, $\frac{x \times 88}{100} = 528$

$\Rightarrow x = \frac{528 \times 100}{88} = ₹ 600$

284. Marked price of shirt = ₹ 1080

Selling price of shirt = ₹ 1080 - $\frac{1080 \times 12}{100}$

= ₹ (1080 – 129.60) = ₹ 950.40

Let cost price of shirt is ₹ x.

$\therefore x + \frac{x \times 8}{100} = 950.40$

$\Rightarrow \frac{108x}{100} = 950.40$

$x = 950.40 \times \frac{100}{108} =$ ₹ 880

285. Let the C.P. of article be ₹ x.

Profit = 12%

Rate of sales tax = 10%

Sale price of an article including sales tax = ₹ 1232

According to the question.

$\frac{112x}{100} + \frac{112x \times 10}{10000} = 1232$

$\Rightarrow \frac{1120x + 112x}{1000} = 1232$

$\Rightarrow 1232x = 1232 \times 1000$

$\Rightarrow x =$ ₹ 1000

286. Given, Present value of machine = ₹ 729

Rate of depreciation = 10%

$\therefore$ Worth three years ago $= \frac{P}{(1-r)^3} = \frac{729}{\left(1 - \frac{10}{100}\right)^3} = \frac{729}{\left(\frac{9}{10}\right)^3}$

$= \frac{729 \times 10 \times 10 \times 10}{9 \times 9 \times 9} =$ ₹ 1000

Hence three year ago, price of machine was ₹ 1000

287. Price of saree including sales tax = ₹ 5225

Cost price without sales tax

$= \frac{5,225}{112} \times 100 = 4,665$

The price is decreased

= ₹ (5,225 – 4,665) = 560

288. Let C.P. of chair be ₹ x

According to the question,

$752 - a = (a - 400) \times 1.2$

$\Rightarrow 752 - a = 1.2a - 480$

$\Rightarrow 1.2a + a = 752 + 480$

$\Rightarrow 2.2a = 1232$

$\Rightarrow a = \frac{1232}{2.2} = ₹ 560$

289. C.P. of each copy = ₹ 5

C.P. of 24 copies

= ₹ (24 × 5) = ₹ 120

S.P. of 25 copies = ₹ (25 × 6)

= ₹ 150

Profit = ₹ (150 – 120) = ₹ 30

Profit per cent = $\frac{30}{120} \times 100 = 25\%$

290. S.P. of washing machine = ₹ 8500

Loss% = 15%

C.P. of washing machine

$= ₹ \left(\frac{100}{85} \times 8500\right)$

$= ₹ 10000$

291. Marked price of cycle = ₹ 1150

Discount percent = 15%

Sale price = $1150 - \frac{1150 \times 15}{100}$ = ₹(1150 − 172.5) = ₹ 977.5

Let CP of cycle be ₹ x

According to given information

x + 15% of x = ₹ 977.5

$\Rightarrow \frac{115x}{100} = 977.5$

$x = \frac{977.5 \times 100}{115}$

x = ₹ 850

292. Let price of article is ₹ 100.

First increase% = 20%

After increase, price of article

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

Second decrease% = 25%

After decrease, price of article = $120 - \frac{120 \times 25}{100} = ₹ 90$

Net change percent in price

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

EXERCISE

(DATA SUFFICIENCY TYPE QUESTIONS)

1. A shopkeeper sells some toys at ₹ 250 each. What percent profit does he make?

To find the answer, which of the following information given in Statements I and II is / are necessary?

I. Number of toys sold **II.** Cost price of each toy

(*a*) Only I is necessary.

(*b*) Only II is necessary.

(*c*) Both I and II are necessary.

(*d*) Either I or II is necessary.

(*e*) None of these

2. A shopkeeper sells some articles at the profit of 25% on the original price. What is the exact amount of profit?

To find the answer, which of the following information given in Statements I and II is / are necessary?

I. Sale price of the article **II.** Number of articles sold

(*a*) Only I is necessary.

(*b*) Only II is necessary.

(*c*) Either I or II is necessary.

(*d*) Both I and II are necessary.

(*e*) None of these

Directions (*Questions 3 to 20*): ***Each of the questions given below consists of a statement and/or a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statement(s) is/are sufficient to answer the question. Read both the statements and***

Give answer (a) if the data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question;

Give answer (b) if the data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question;

Give answer (c) if the data either in Statement I or in Statement II alone are sufficient to answer the question;

Give answer (d) if the data even in both Statements I and II together are not sufficient to answer the question;

Give answer (e) if the data in both Statements I and II together are necessary to answer the question.

3. By selling a product with 20% profit, how much profit was earned?

I. The difference between cost and selling price is ₹ 40.

II. The selling price is 120 percent of the cost price.

4. What is the amount of profit earned? **(Bank P.O., 2006)**

I. 20% profit is earned by selling an article for ₹ 1740.

II. Cost price of the article is ₹ 1450.

5. What is the cost price of the article?

I. The profit earned on the article is one-third of the cost price.

II. The article is sold for ₹ 400.

6. What was the percent profit/loss made/incurred by selling an article for ₹ 24000?

I. The ratio of the selling price to the cost price of the article is 5 : 3.

II. The difference between the cost price and the selling price is ₹ 9600. **(Bank P.O., 2010)**

7. What would have been the selling price per kg of rice?

I. 50 kg of rice was purchased for ₹ 3350 and ₹ 150 were spent on transport.

II. Profit earned was 5%.

8. How much was the loss? **(M.B.A., 2005)**

I. The cost is ₹ 300.

II. The loss is 25% of the selling price.

9. What is the percentage profit on the cost price? **(M.A.T., 2008)**

I. The cost price is ₹ 368.35.

II. There is a 20% profit on the selling price.

10. A pair of skis originally cost $160. After a discount of x%, the skis were discounted y%. Do the skis cost less than $130 after the discounts? **(M.B.A., 2006)**

I. $x = 20$

II. $y = 15$

11. A man mixes two types of rice (X and Y) and sells the mixture at the rate of ₹ 17 per kg. Find his profit percentage.

I. The rate of X is ₹ 20 per kg.

II. The rate of Y is ₹ 13 per kg.

12. What is the percent profit earned by selling the product?

I. The profit earned was ₹ 50.

II. Had it been sold for ₹ 310, the profit would have been ₹ 70.

13. What is the cost price of the cassette?

I. The percent profit made when the cassette is sold for ₹ 78 is twice as much as when it is sold for ₹ 69.

II. If the price of the cassette is marked at 20% above the cost price and a discount of 10% is offered on the marked price, the seller gains 8%.

14. What was the cost price of the suitcase purchased by Richard? **(SNAP, 2005)**

I. Richard got 20% concession on the labelled price.

II. Richard sold the suitcase for ₹ 2000 with 25% profit on the labelled price.

15. What percent is the earned profit? **(Bank P.O., 2003, 2005, 2007)**

I. 10% discount is offered on the marked price.

II. If no discount is given, the profit will be 30%.

16. By selling a product for ₹ 200, how much profit was earned?

I. The profit was 25 percent of the cost price.

II. 12.5 percent profit would have been earned if the product had been sold for ₹ 180. **(S.I.D.B.I., 2006, M.A.T., 2006)**

17. A trader sold two washing machines each for ₹ 7392. What was his total profit or loss on these two transactions?

I. On one transaction he got a profit of 12% on investment

II. On the other transaction he suffered a loss of 4% on investment.

18. What is the price of a banana?

I. A man can buy 14 bananas and 35 oranges for ₹ 84.

II. With 50% discount on the price of bananas, ₹ 12 would buy 4 bananas and 5 oranges.

19. How much profit did Anand make by selling a bed?

I. He bought the bed with 40% discount on labelled price.

II. He sold it with 20% profit on the labelled price.

20. What is the profit earned by selling a laptop for ₹ 26250? **(Bank P.O., 2009)**

I. The cost price of 5 such laptops is equal to selling price of 4 such laptops.

II. 25% profit is earned by selling each laptop.

Directions (*Questions 21–27*): *Each of the following questions consists of a question followed by three statements I, II and III. You have to study the question and the statements and decide which of the statement*(s) *is/are necessary to answer the question.*

21. How many articles were sold? **(Bank P.O., 2008)**

I. Total profit earned was ₹ 1596.

II. Cost price per article was ₹ 632.

III. Selling price per article was ₹ 765.

(*a*) Any two of the three (*b*) I and II only

(*c*) II and III only (*d*) All I, II and III

(*e*) Question cannot be answered even with the information in all the three statements.

22. What was the amount of profit earned?

I. 10% discount was offered on the labelled price.

II. Had there been no discount, profit would have been 30%.

III. Selling price was more than the cost price by 20%.

(*a*) All I, II and III (*b*) Any two of the three

(*c*) III, and either I or II (*d*)I, and either II or III

(*e*) Question cannot be answered even with the information in all the three statements.

23. What was the cost price of the watch?

I. The shopkeeper labelled the price of the watch 20% above the cost price.

II. After allowing a discount of 15% on the labelled price, the shopkeeper charges ₹ 408 for the watch.

III. Had there been no discount, the shopkeeper would have earned 20% profit.

(*a*) I, and either II or III (*b*)II, and either I or III

(*c*) III, and either I or II (*d*) I and II only

(*e*) Any two of the three

24. How much profit did Manick earn on the cost price of an article by selling it?

I. He got 15% discount on the marked price at the time of purchase.

II. He sold it for ₹ 3060.

III. He earned 2% profit on the marked price. **(M.A.T., 2006)**

(*a*) I and II only
(*b*) II and III only
(*c*) I only or II and III together
(*d*) All I, II and III
(*e*) Even I, II and III together are not sufficient to answer the question.

25. By selling an article what is the profit percent gained?

I. 5% discount is given on list price.

II. If discount is not given, 20% profit is gained.

III. The cost price of the article is ₹ 5000.

(*a*) Only I and II (*b*) Only II and III
(*c*) Only I and III (*d*) All I, II and III
(*e*) None of these

26. An item costing ₹ 3000 is sold at a certain discount. Find the rate of discount offered.

I. The profit earned after discount is 5%.

II. Had the discount rate been doubled, the seller incurs a loss of 15%.

III. The item is marked at a price 25% above the cost price.

(*a*) Only I and II (*b*) Only II and III
(*c*) Only I and III (*d*) All I, II and III
(*e*) Any two of the three

27. What was the percentage of discount given?

I. 23.5% profit was earned by selling an almirah for ₹ 12,350.

II. If there were no discount, the earned profit would have been 30%.

III. The cost price of the almirah was ₹ 10,000.

(*a*) Only I and II
(*b*) Only II and III
(*c*) Only I and III
(*d*) Any two of the three
(*e*) None of these

Directions (Questions 28-29): Each of these questions is followed by three statements. You have to study the question and all the three statements given to decide whether any information provided in the statement(s) is/are redundant and can be dispensed with while answering the given question.

28. What is the percent profit earned by the shopkeeper on selling the articles in his shop?

I. Labelled price of the articles sold was 130% of the cost price.

II. Cost price of each article was ₹ 550.

III. A discount of 10% on labelled price was of fered. **(N.M.A.T., 2005)**

(*a*) Only I
(*b*) Only II
(*c*) Only III
(*d*) All the three are required
(*e*) Question cannot be answered even with information in all the three statements.

29. What is the marked price of the suitcase?

I. When a discount of 15% is offered, the profit earned is 10.5%.

II. The cost price of the suitcase is ₹ 1500.

III. The marked price is 30% above the cost price.

(*a*) I only
(*b*) Either I or III
(*c*) Any one of the three
(*d*) All I, II and III are required
(*e*) None of these

ANSWERS

1. (*b*)	**2.** (*d*)	**3.** (*a*)	**4.** (*a*)	**5.** (*e*)	**6.** (*a*)	**7.** (*e*)	**8.** (*e*)	**9.** (*b*)	**10.** (*a*)
11. (*d*)	**12.** (*b*)	**13.** (*a*)	**14.** (*e*)	**15.** (*e*)	**16.** (*c*)	**17.** (*e*)	**18.** (*d*)	**19.** (*d*)	**20.** (*c*)
21. (*d*)	**22.** (*e*)	**23.** (*b*)	**24.** (*d*)	**25.** (*a*)	**26.** (*e*)	**27.** (*e*)	**28.** (*b*)	**29.** (*b*)	

SOLUTIONS

1. S.P. = ₹ 250 each. To find gain percent, we must know the C.P. of each.

∴ Correct answer is (*b*).

2. Gain = 25% of C.P.

In order to find gain, we must know the sale price of each article and the number of articles sold.

∴ Correct answer is (*d*).

3. Gain = 20%

I. Profit = (S.P.) – (C.P.) = ₹ 40.

Thus, I gives the answer.

But, II does not give the answer.

∴ Correct answer is (*a*).

4. I. S.P. = ₹ 1740.

Profit = 20%. C.P. = ₹ $\left(\frac{100}{120} \times 1740\right)$ = ₹ 1450.

$\therefore$ Profit = ₹ (1740 – 1450) = ₹ 290.

Thus, I alone gives the answer.

The information given in II can be deduced from I as shown and is insufficient.

$\therefore$ Correct answer is (*a*).

5. I. Gain = $\frac{1}{3}$ (C.P.).

II. S.P. = ₹ 400.

Gain = (S.P.) – (C.P.)

$\Rightarrow \frac{1}{3}$ (C.P.) = (₹ 400) – (C.P.)

$\Rightarrow \left(1+\frac{1}{3}\right)$ (C.P.) = ₹ 400

$\Rightarrow$ C.P. = ₹ $\left(400\times\frac{3}{4}\right)$ = ₹ 300.

Thus, I and II both are needed to get the answer.

$\therefore$ Correct answer is (*e*).

6. I. Let C.P. = ₹ $3x$ and S.P. = ₹ $5x$.

Profit = ₹ $(5x - 3x)$ = ₹ $2x$.

$\therefore$ Profit% = $\left(\frac{2x}{3x}\times 100\right)\% = 66\frac{2}{3}\%$.

Thus, I alone gives the answer.

II. From the given information, it cannot be deduced whether it is a profit or loss.

Thus, II alone is insufficient.

$\therefore$ Correct answer is (*a*).

7. I. Total C.P. of 50 kg = ₹ (3350 + 150) = ₹ 3500.

$\therefore$ C.P. of 1 kg = ₹ $\left(\frac{3500}{50}\right)$ = ₹ 70.

II. Gain = 5%.

$\therefore$ S.P. of 1 kg = 105% of ₹ 70 = ₹ $\left(70\times\frac{105}{100}\right)$ = ₹ 73.50.

Thus, both I and II are needed to get the answer.

$\therefore$ Correct answer is (*e*).

8. I. C.P. = ₹ 300.

II. Loss = 25% of S.P.

Let S.P. be ₹ x. Then, loss = 25% of ₹ x = ₹ $\frac{x}{4}$.

Loss = (C.P.) – (S.P.)

$\Rightarrow \frac{x}{4} = 300 - x \Rightarrow \left(x+\frac{x}{4}\right) = 300$

$\Rightarrow x = \left(300\times\frac{4}{5}\right) = 240.$

$\therefore$ Loss = 25% of ₹ 240 = ₹ $\left(\frac{25}{100}\times 240\right)$ = ₹ 60.

Thus, I and II are required to get the answer. $\therefore$ Correct answer is (*e*).

9. II. Let. S.P. = ₹ x. Then, profit = 20% of ₹ x = ₹ $\frac{x}{5}$.

C.P. = ₹ $\left(x-\frac{x}{5}\right)$ = ₹ $\frac{4x}{5}$.

$\therefore$ Profit% = $\left(\frac{x}{5}\times\frac{5}{4x}\times 100\right)\% = 25\%$.

So, II alone gives the answer, while I alone does not.

$\therefore$ Correct answer is (*b*).

10. I. Price of skis after discount of 20%

= ₹ $\left(\frac{80}{100}\times 160\right)$ = ₹ 128 (< ₹ 130)

So, I alone gives the answer, while II alone does not.

$\therefore$ Correct answer is (*a*).

11. The ratio in which X and Y are mixed, is not given.

So, both I and II together cannot give the answer.

$\therefore$ Correct answer is (*d*).

12. II gives, S.P. = ₹ 310 and gain = ₹ 70.

$\therefore$ C.P = ₹ (310 – 70) = ₹ 240.

$\therefore$ Gain% = $\left(\frac{70}{240}\times 100\right)\%$.

Thus, II alone gives the answer.

Clearly, I alone does not give the answer.

$\therefore$ Correct answer is (*b*).

13. Let the C.P. be ₹ x. Then,

I. $\frac{(78-x)}{x}\times 100 = 2\times\frac{(69-x)}{x}\times 100$

$\Leftrightarrow 78 - x = 138 - 2x \Leftrightarrow x = 60.$

Thus, I only gives the answer.

II. Let the C.P. be ₹ x. Then, M.P. = ₹ $\left(\frac{120}{100}\times x\right)$ = ₹ $\frac{6x}{5}$.

$\therefore$ S.P. = 90% of ₹ $\frac{6x}{5}$ = ₹ $\left(\frac{6x}{5}\times\frac{90}{100}\right)$ = ₹ $\frac{27x}{25}$.

Thus, 108% of x = $\frac{27x}{25}$. This does not give x.

$\therefore$ II does not give the answer.

$\therefore$ Correct answer is (*a*).

14. Let the labelled price be ₹ x.

I. C.P. = 80% of ₹ x = ₹ $\left(x\times\frac{80}{100}\right)$ = ₹ $\frac{4x}{5}$.

II. S.P. = ₹ 2000, S.P. = 125% of ₹ x = ₹ $\left(\frac{125}{100}\times x\right)$ = ₹ $\frac{5x}{4}$.

$\therefore \frac{5x}{4} = 2000 \Rightarrow x = \frac{2000\times 4}{5} = 1600.$

$\therefore$ C.P. = ₹ $\frac{4x}{5}$ = ₹ $\left(\frac{4}{5}\times 1600\right)$ = ₹ 1280.

Thus, I and II together give the answer.

$\therefore$ Correct answer is (*e*).

15. II. Let C.P. = ₹ x. Then, M.P. = 130% of ₹ x = ₹ $\left(\frac{13x}{10}\right)$.

I. Discount = 10%.

S.P. = 90% of ₹ $\frac{13x}{10}$ = ₹ $\left(\frac{90}{100}\times\frac{13x}{10}\right)$ = ₹ $\left(\frac{117x}{100}\right)$.

Profit = ₹ $\left(\frac{117x}{100} - x\right)$ = ₹ $\frac{17x}{100}$.

$\therefore$ Profit% = $\left(\frac{17x}{100}\times\frac{1}{x}\times 100\right)\% = 17\%$.

Thus, I and II together give the answer.
∴ Correct answer is (*e*).

16. S.P. = ₹ 200.

I. C.P. = $₹\left(\frac{100}{125}\times 200\right) = ₹\,160.$

∴ Profit = ₹ (200 – 160) = ₹ 40.
So, I alone gives the answer.

II. When S.P. = ₹ 180, Gain = 12.5%.

∴ C.P. = $₹\left(\frac{100}{112.5}\times 180\right) = ₹\,160.$

Profit earned = ₹ (200 – 160) = ₹ 40.
Thus, II alone also gives the answer.
∴ Correct answer is (*c*).

17. **I.** S.P. = ₹ 7392. Profit = 12%.

C.P. of first machine = $₹\left(\frac{100}{112}\times 7392\right) = ₹\,6600.$

II. S.P. = ₹ 7392. Loss = 4%.

C.P. of second machine = $₹\left(\frac{100}{96}\times 7392\right) = ₹\,7700.$

Total C.P. = ₹ (6600 + 7700) = ₹ 14300.
Total S.P.= ₹ (7392 × 2) = ₹ 14784.
Profit = ₹ (14784 – 14300) = ₹ 484.
Thus, I and II together give the answer.
∴ Correct answer is (*e*).

18. Let the price of a banana be ₹ x and that of an orange ₹ y.

I. $14x + 35y = 84 \Rightarrow 2x + 5y = 12$ ...(*i*)

II. $4\times\frac{x}{2} + 5y = 12 \Rightarrow 2x + 5y = 12$ ...(*ii*)

Thus, even I and II together do not give the answer.
∴ Correct answer is (*d*).

19. **I.** Let the labelled price be ₹ x.

C.P. = 60% of ₹ x = $₹\left(x\times\frac{60}{100}\right) = ₹\,\frac{3x}{5}.$

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

Profit = $₹\left(\frac{6x}{5} - \frac{3x}{5}\right) = ₹\,\frac{3x}{5}.$

Thus, even I and II together do not give the answer.
∴ Correct answer is (*d*).

20. **I.** S.P. of 1 laptop = ₹ 26250.
C.P. of 5 laptops = S.P. of 4 laptops
= ₹ (26250 × 4) = ₹ 105000.

⇒ C.P. of 1 laptop = $₹\left(\frac{105000}{5}\right) = ₹\,21000.$

Profit earned by selling a laptop
= ₹ (26250 – 21000) = ₹ 5250.
So, I alone gives the answer.

II. S.P. = ₹ 26250, Profit = 25%.

C.P. = $₹\left(\frac{100}{125}\times 26250\right) = ₹\,21000.$

Profit = ₹ (26250 – 21000) = ₹ 5250.
So, II alone also gives the answer.
∴ Correct answer is (*c*).

21. **I.** Total gain = ₹ 1596.

II. C.P. of each article = ₹ 632.

III. S.P. of each article = ₹ 765.

Let the number of articles be x.

Then, $765x - 632x = 1596 \Rightarrow x = \frac{1596}{133} = 12.$

Thus, all I, II and III are needed to get the answer.
∴ Correct answer is (*d*).

22. Let the M.P. be ₹ x.

I. S.P. = 90% of ₹ x = $₹\left(x\times\frac{90}{100}\right) = ₹\,\frac{9x}{10}.$

II. If S.P. = ₹ x, then gain = 30%.

∴ C.P. = $₹\left(\frac{100}{130}\times x\right) = ₹\,\frac{10x}{13}.$

III. Gain = 20%.

Thus, I, II, III do not give the answer.
∴ Correct answer is (*e*).

23. **I.** Let the C.P. be ₹ x.

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

II. S.P. = 85% of M.P. = $₹\left(\frac{6x}{5}\times\frac{85}{100}\right) = ₹\,\frac{51x}{50}.$

∴ $\frac{51x}{50} = 408 \Rightarrow x = \left(408\times\frac{50}{51}\right) \Rightarrow x = 400.$

Thus, I and II give the answer.

III. When there is no discount, then S.P. = M.P. = $₹\,\frac{6x}{5}$

[From I]
Thus, II and III give the same answer.
∴ Correct answer is (*b*).

24. Let the M.P. be ₹ x.

I. C.P. = 85% of ₹ x = $₹\left(x\times\frac{85}{100}\right) = ₹\,\frac{17x}{20}.$

II. S.P. = ₹ 3060.

III. 102% of x = 3060 $\Rightarrow x = \left(3060\times\frac{100}{102}\right) = 3000.$

∴ C.P. = $₹\,\frac{17x}{20} = ₹\left(\frac{17}{20}\times 3000\right) = ₹\,2550.$

So, gain = ₹ (3060 – 2550) = ₹ 510.
Thus all I, II and III give the answer.
∴ Correct answer is (*d*).

25. **I.** Let the list price be ₹ x.

Then, S.P. = 95% of ₹ x = $₹\left(x\times\frac{95}{100}\right) = ₹\,\frac{19x}{20}.$

II. When S.P. = ₹ x and gain = 20%.

Then, C.P. = $₹\left(\frac{100}{120}\times x\right) = ₹\,\frac{5x}{6}.$

$\therefore$ Gain $= \left(\frac{19x}{20} - \frac{5x}{6}\right) = \left(\frac{57x - 50x}{60}\right) = \frac{7x}{60}$.

$\therefore$ Gain% $= \left(\frac{7x}{60} \times \frac{6}{5x} \times 100\right)\% = 14\%$.

Thus, I and II only give the answer.

$\therefore$ Correct answer is (*a*).

26. C.P. = ₹ 3000. Let the rate of discount be x%.

I. S.P. = 105% of ₹ 3000 = ₹ 3150.

II. Let M.P. = ₹ x.

Then, $\frac{(x - 3150)}{(x - 85\% \text{ of } 3000)} = \frac{1}{2} \Rightarrow x = 3750$.

From I and II, discount = ₹ (3750 – 3150) = ₹ 600.

Discount% $= \left(\frac{600}{3750} \times 100\right)\% = 16\%$.

Thus, I and II give the answer.

III. M.P. = 125% of ₹ 3000 = ₹ 3750.

From I and III, discount = (M.P.) – (S.P.) = ₹ 600.

Thus, Discount% can be calculated.

Thus, I and III give the answer.

From II and III, we get :

discount $= ₹\left(\frac{3750 - 85\% \text{ of } 3000}{2}\right) = ₹\,600$.

Thus, II and III give the answer.

$\therefore$ Correct answer is (*e*).

27. **I.** S.P. = ₹ 12350, Gain = 23.5%.

$\therefore$ C.P. = $₹\left(\frac{100}{123.5} \times 12350\right) = ₹\,10000$.

II. M.P. = 130% of C.P. = 130% of ₹ 10000 = ₹ 13000.

From I and II, discount = ₹ (13000 – 12350) = ₹ 650.

Discount% = $\left(\frac{650}{13000} \times 100\right)\% = 5\%$.

Thus, I and II give the answer.

III. gives C.P. = ₹ 10000.

So, II and III give the answer.

$\therefore$ Correct answer is (*e*).

28. **I.** Let C.P. be ₹ x.

Then, M.P. = 130% of x = $₹\,\frac{13x}{10}$.

III. S.P. = 90% of M.P.

Thus, I and III give, S.P. = $₹\left(\frac{90}{100} \times \frac{13x}{10}\right) = ₹\,\frac{117x}{100}$.

Gain = $₹\left(\frac{117x}{100} - x\right) = ₹\,\frac{17x}{100}$.

Thus, from I and III, gain% can be obtained.

Clearly, II is redundant.

$\therefore$ Correct answer is (*b*).

29. **II.** C.P. = ₹ 1500.

I. Gain = 10.5%.

$\therefore$ From I and II, we get : S.P. = 110.5% of C.P.

$= ₹\left(\frac{110.5}{100} \times 1500\right) = ₹\,1657.50$.

Discount = 15%.

$\therefore$ M.P. $= ₹\left(\frac{100}{85} \times 1657.50\right) = ₹\,1950$.

Thus, I and II give the answer and so III is redundant.

III. M.P. = 130% of C.P.

From II and III, we get : M.P. $= ₹\left(\frac{130}{100} \times 1500\right) = ₹\,1950$.

$\therefore$ II and III give the answer and so I is redundant.

So, either I or III is redundant.

$\therefore$ Correct answer is (*b*).