



# CUET - UG

**Common University Entrance Test**

National Testing Agency

General Test

**Quantitative Aptitude**



# CUET (UG)

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## PROFIT & LOSS

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When a person buy something at lower amount and sell it at more amount, the Margin between buying Price and selling price is known as "profit"

$$\text{Profit / Gain} = \text{Selling Price} - \text{cost price}$$

When a person buy something at higher price and sell it at lower price, the Margin between buying price and selling price is known as "loss".

$$\text{Loss} = \text{cost price} - \text{Selling price}$$

- While solving the questions, we use some abbreviations instead of complete words such as :-

$$\text{cost price} = \text{C.P} \quad ; \quad \text{profit} = \text{P}$$

$$\text{Selling Price} = \text{S.P} \quad ; \quad \text{Loss} = \text{L}$$

$$\text{Marked Price} = \text{M.P} \quad ; \quad \text{discount} = \text{d}$$

- These are few formulas which are frequently used while solving questions :-

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

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

$$S.P. = C.P. \times \left( \frac{100 + P\%}{100} \right) \rightarrow \text{In case of profit.}$$

$$S.P. = C.P. \times \left( \frac{100 - L\%}{100} \right) \rightarrow \text{In case of loss.}$$

Above these two formulas are Asked when C.P is Asked :-

$$C.P. = S.P \times \left( \frac{100}{100 + P\%} \right) \rightarrow \text{In case of profit.}$$

$$C.P. = S.P \times \left( \frac{100}{100 - L\%} \right) \rightarrow \text{In case of loss.}$$

\* There is another important term 'discount' which is the difference between marked price and selling price. Every seller mark his goods and sell them at certain discount to attract customers. so here on the basis of that Questions are Asked :-

$$\text{Discount} = \text{Market price} - \text{Selling Price.}$$

$$\text{Selling price} = M.P. \times \left( \frac{100 - d\%}{100} \right)$$

$$M.P. = S.P. \times \left( \frac{100}{100 - d\%} \right)$$

### PRACTICE EXAMPLES

Q.1 Cost price the article is ₹ 800 and it is sold at 15% profit then what is the selling price?

Sol: By formula:

$$S.P = C.P \times \left( \frac{100 + P\%}{100} \right)$$

$$S.P = 800 \times \left( \frac{100 + 15\%}{100} \right)$$

$$S.P = 800 \times \frac{115}{100} = 920 \text{ ₹}$$

Here denominator is real value & numerator is increase of decrease in real value:-

C.P	P	S.P
20	3	23
↓ 40x		↓ x40
800		920

If the value of C.P is 40 times from our fraction C.P then S.P will also be 40 times from our fraction S.P

By Percentage:-

As we studied in Percentage, how to convert percent in fraction:-

$$15\% = \frac{15}{100} = \frac{3}{20}$$

Q.2 A milkman buys 70 litre milk in ₹ 630 and add 5 litre water in it. Now he sells the mixture at 9 ₹/ litre then what is the profit%?

Sol: C.P of 70 litre Milk = 630 ₹

C.P of 75 litre Milk = 630 ₹

S.P of 75 litre Milk = 75 x 9 = 675 ₹

$$P\% = \left( \frac{S.P - C.P}{C.P} \right) \times 100$$

$$= \frac{675 - 630}{630} \times 100 = 7 \frac{1}{7} \%$$

∴ { Because water has }  
 { nil value }

Q. 3 A man buys a old type writer in ₹ 1200 and spends ₹ 200 on its repairing. Now he sells it at ₹ 1680 then what is profit%?

sol: C.P of typewriter = 1200 ₹

Actual C.P of typewriter that a person paid = 1400 ₹

S.P. = 1680 ₹

$$P\% = \frac{280 \times 100}{1400} = 20\%$$

Q. 4 A shopkeeper sells an article at 13% Profit. If at the end of a month total sell is at ₹ 33,900 then what is the total profit of him in it?

sol:  $13\% = 13/100$

C.P	P	S.P
100	13	113
	↓ × 300	↓ × 300
	3900 ₹	33900

Q. 5 Sunil buys an article at 20% less price than original cost price and sells it at 40% more price than the price paid by him. Then what is profit % on the original cost price?

sol: Let C.P = 100 ₹

He bought at 20% less so  $C.P = 100 \times \frac{80}{100} = 80 ₹$

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

then,  $P\% = 12/100 \times 100 = 12\%$

Q. 6 Cost Price of an article is 75% of S. P. then what is Profit%?

sol:  $33\frac{1}{3}\%$

Q. 7 When 33 metre cloth is sold then there is profit equal to C. P. of 11 metre cloth so what is profit %?

sol:  $33\frac{1}{3}\%$

Q. 8 Cost Price of an radio is ₹ 600. If 5% of C. P. is spend on transportation. Now it is sold at 15% Profit then what is S. P.?

sol: 724.5

Q. 9 When an article is sold at ₹ 450 then seller bears the loss of 20%. So to gain the 20%, at what rate it should be sold?

sol: 675

#### EFFECT ON PRICE IN %:

Q. 10 A shopkeeper buys two mobiles each at the same price. He sells one at 18% Profit and another at 10% loss then what is the net effect on the C. P.?

sol: Basic

Let rate of each mobile is 100 ₹

So the selling price of 1st mobile =  $100 \times \left(\frac{100+18}{100}\right) = 118 ₹$

Selling price of 2nd mobile =  $100 \times \left(\frac{100-10}{100}\right) = 90 ₹$

Total CP of both mobiles =  $100+100 = 200 ₹$

S.P. of both mobiles =  $118+90 = 208 ₹$

So, the profit percent is =  $\frac{8}{200} \times 100$

= 4% profit

**C. P. AND S. P. IN TERMS OF QUANTITY:**

Q. 11 C. P. at 36% books is equal to selling price of 30 books so what is profit %?

sol: Basic:-

let C.P of each book =  $x$  ₹

let S.P of each book =  $y$  ₹

∴ C.P of 36 books =  $36x$  ₹

S.P of 30 books =  $30y$  ₹

C.P of 36 book = S.P of 30 books

$$36x = 30y$$

$$\frac{x}{y} = \frac{30}{36}$$

$$\text{Profit \%} = \frac{36-30}{30} \times 100$$

$$= \frac{6}{30} \times 100 = 20\%$$

Q. 12 S. P. of 5 articles is equal to C. P. of 3 articles. what is profit or loss %?

sol:

S.P of 5 = C.P of 3

$$\frac{\text{C.P}}{\text{S.P}} = \frac{5}{3}$$

$$\text{Loss \%} = \frac{2}{5} \times 100 = 40\% \text{ loss}$$

Trick:-

C.P. of 36 = S.P. of 30

$$\text{C.P/S.P} = \frac{30}{36}$$

$$\text{Profit \%} = \frac{6}{30} \times 100$$

$$= 20\%$$



Q. 13 17 balls are sold in ₹ 720 then the seller bears the loss equal to C. P. of 5 balls. Then what is the C. P. of a ball?

Sol:

$$\boxed{C.P. - \text{loss} = S.P.}$$

$$\boxed{C.P. + \text{profit} = S.P.}$$

$$C.P. \text{ of } 17 \text{ balls} - C.P. \text{ of } 5 \text{ balls} = S.P. \text{ of } 17 \text{ balls}$$

$$C.P. \text{ of } 12 \text{ balls} = S.P. \text{ of } 17 \text{ balls}$$

$$C.P. \text{ of } 12 \text{ balls} = 720$$

$$C.P. = 720/12 = 60 \text{ ₹}$$

$$\therefore \left\{ \begin{array}{l} \text{It is given that S.P. of } 17 \text{ balls} \\ \text{is } 720 \text{ ₹} \end{array} \right\}$$

Q. 14 Pradeep gets the loss equal to S. P. of 6 goats when he sells 144 goats. What is loss%?

Sol:

$$C.P. \text{ of } 144 \text{ goats} - S.P. \text{ of } 6 \text{ goats} = S.P. \text{ of } 144 \text{ goats}$$

$$C.P. \text{ of } 144 \text{ goats} = S.P. \text{ of } 144 \text{ goats} + S.P. \text{ of } 6 \text{ goats}$$

$$C.P. \text{ of } 144 \text{ goats} = S.P. \text{ of } 150 \text{ goats}$$

$$\frac{C.P.}{S.P.} = \frac{150}{144}$$

$$\text{Loss \%} = \frac{6}{150} \times 100 = 4\% \text{ loss}$$

Q. 15 When a person sells 14 matches at the rate of ₹ 450 per match and bears a profit equal to C. P. of 4 matches then what is the C. P. of per match?

Sol: 350

**BUY TWO SAME QUANTITY AT DIFFERENT RATES:**

Q. 16 Anisha buys some apples at the rate of 2 apples per rupee and the same quantity at the rate of 3 apples per rupee. So to get 20% profit, in how much rupees should a single dozen apples be sold?

Sol: C.P of 2 apples is  $\rightarrow 1\text{ ₹}$   
 C.P of 6 Apples is  $\rightarrow 3\text{ ₹}$  ... ①  
 C.P of 3 Apples is  $\rightarrow 1\text{ ₹}$   
 C.P of 6 Apples is  $\rightarrow 2\text{ ₹}$  ... ②

So, C.P of 12 Apples is  $\rightarrow 5\text{ ₹}$   
 then S.P of 12 Apples =  $5 \times \left(\frac{120}{100}\right) = 6\text{ ₹}$

Q. 17 Nitesh buys few articles at 5 articles per rupees and the same no of articles are bought at 4 articles per rupee. Both are mixed and sold at 9 articles per 2 rupee. Then he gets the loss at ₹ 3. So how many articles were both by him?

Sol: C.P. of 5 Articles is  $\text{--- } 1\text{ ₹}$   
 C.P of 4 Articles is  $\text{--- } 1\text{ ₹}$   $\because \left\{ \begin{array}{l} \text{Question says the quantity} \\ \text{is same so make the} \\ \text{quantity same} \end{array} \right\}$   
 C.P of 5 Articles  $\text{--- } 4\text{ ₹}$   
 C.P of 4 Articles  $\times 5 \rightarrow 5\text{ ₹}$

$9 \times \text{C.P of 40 Articles} = 9\text{ ₹} \times 9$   $\because \left\{ \begin{array}{l} \text{here also same quantity} \\ \text{is sold.} \end{array} \right\}$   
 $40 \times \text{S.P of 9 Articles} = 2\text{ ₹} \times 40$

C.P of 360 Articles  $\rightarrow 81\text{ ₹}$   $\left. \begin{array}{l} > 1\text{ ₹} = \text{loss} \\ \downarrow \times 3 \end{array} \right\} \because \left\{ \begin{array}{l} \text{value of 1 ₹ loss is} \\ 3 \text{ so value is 3 times} \end{array} \right\}$   
 S.P of 360 Articles  $\rightarrow 80\text{ ₹}$   
 $\downarrow \times 3$   
1080 Articles

Q. 18 Yogesh buys few oranges at the rate of ₹ 60 per 20 oranges and the equal no of oranges are bought at the rate ₹ 60 per oranges. Both types are mixed and sold at the rate at ₹ 60 per 25 oranges. Then what is the profit and loss%?

sol:

C.P of 20 Oranges  $\rightarrow$  60 ₹

C.P of 30 Oranges  $\rightarrow$  60 ₹

C.P of  $3 \times 20$  Oranges  $\rightarrow 60 ₹ \times 3$

C.P of  $2 \times 30$  Oranges  $\rightarrow 60 \times 2 ₹$

---

C.P of 120 Oranges  $\rightarrow$  360 ₹

S.P of 25 Oranges  $\rightarrow$  60 ₹

C.P of  $120 \times 5$  Oranges = 600  $\rightarrow$  1500 ₹

S.P of  $25 \times 24$  Oranges = 600  $\rightarrow$  1440 ₹

Loss% =  $\frac{60}{1500} \times 100 = 4\%$  Loss

$\because$  { Because no. of oranges are same, so make it same.

{ Because no's are Equal for selling and buying }

Q. 19 Rashmi buys few kiwis at the rate of 3 kiwi per ₹ 5 and same no of kiwis at the rate of 4 kiwi per ₹ 5. Both types are mixed and sold at the rate of 2 kiwi per ₹ 5. Then what is the profit%?

sol:  $71\frac{3}{7}\%$

**ASSUME CP LESS / HIGH, SELL AT HIGH / LOW**

Q. 20 A shopkeeper sell a cycle at 10% Profit. if he would have bought it at 10% less price and sell it in ₹ 60 more then he gets the profit of 25%. what is C. P. of cycle?

sol: let price of cycle is 100 ₹

Original Value	C.P	S.P
	100	→ 110    2.5
-10	90	→ $90 \times \frac{25}{100} = 112.5$
Assumed Value		

Acc. to us increase in S.P is 2.5 but question says it is 60 ₹. So,

$$2.5 = 60$$

$$1 = 24$$

$$C.P = 100 \times 24 = 2400 \text{ ₹}$$

Q. 21 A businessman sells an article at 10% Profit. if he buys it at 10% less and sells it at ₹ 2 less then he gets the profit of  $16\frac{2}{3}\%$ . what is C. P. at an article?

sol: C.P                      S.P

Original Value	100	→	110	} 5
-10	90	→	$90 \times \frac{7}{6} = 105$	
Assumed Value				

$$5 = 2$$

$$1 = 2/5$$

$$\text{So } C.P = 100 \times 2/5 = 240 \text{ ₹}$$

Q. 22 A businessman sells an article at 5% loss. if he buys it at 10% less price and sells it in ₹ 33 more, he gets the profit of 30%. Then what is C. P. of an article?

sol: 150

Q. 23 A person sells an article at 15% Profit. If he buys it at 10% less and sells it at ₹ 4 less then he gets the profit of 25%. What is C. P.?

Sol: 160

**DIFFERENCE OF P/L:**

Q. 24 A table is sold at 13% Profit. If it is sold at ₹ 25 more than profit is 18%. What is C. P. of table?

Sol: Basic Let C.P. is  $x$

$$(S.P.)_1 = x \times \left( \frac{100+13}{100} \right)$$

$$(S.P.)_2 = x \times \frac{113}{100} - (1)$$

When it is sold at 25 ₹ more, then

$$x \times \frac{113}{100} + 25 = x \times \left( \frac{100+18}{100} \right)$$

$$x \times \frac{113}{100} = x \times \frac{118}{100} - 25$$

$$x \times \frac{5}{100} = 25, x = 500 \text{ ₹}$$

Trick  $18\% - 13\% = 25$

$$5\% = 25$$

$$1\% = 5$$

$$100\% = 500 \text{ ₹}$$

∴ opposites are  
summed and for same

We take difference

P, P = difference

L, L = difference

P, L = Sum.

Q. 25 A person sells a watch at 5% loss. If he sells it at ₹ 56.25 more then he gets 10% profit. What is C. P.?

Sol:

$$10\% + 5\% = 56.25$$

$$15\% = 56.25$$

$$1\% = \frac{15}{4}$$

$$100\% = \frac{15}{4} \times 100 = 375 \text{ ₹}$$

Q. 26 A radio seller sells the radio at 2.5% loss. if he sells it at ₹ 100 more then he gets  $7\frac{1}{2}\%$  profit. so to get  $12\frac{1}{2}\%$  profit, in what rate it should be sold?

Sol: 1125

Q. 27 A person sells an article at 10% loss. if it is sold at ₹ 30 more then gets profit of 20%. what is C. P.?

Sol: 100

**ALLEGATION BASED QUESTION:**

Q. 28 Two types of tea 180 ₹/kg and 280 ₹/kg are mixed in certain ratio and sold in 320 ₹/kg with 20% profit. what is the ratio of mixing?

Sol:

Basic

Let first type tea is  $x$  kg  
 and second type tea is  $y$  kg  
 C.P. of 1st type tea =  $180x = 180x$  ₹  
 C.P. of 2nd type tea =  $280y = 280y$  ₹

S.P. of  $(x+y)$  kg =  $320(x+y)$

$$\text{So, } (180x + 280y) \times \frac{120}{100} = 320(x+y)$$

$$(180x + 280y) \times \frac{6}{5} = 320(x+y)$$

$$(180x + 280y) \times \frac{6}{5} = 320x + 320y$$

$$1080x + 1680y = 1600x + 1600y$$

$$1680y - 1600y = 1600x - 1080x$$

$$80y = 520x$$

$$x/y = 80/520 = 2/13$$

$$x:y$$

$$2:13$$

Allegation

$$\begin{array}{cc}
 180 & 280 \\
 \diagdown & / \\
 320 \times \frac{120}{100} = 800/3
 \end{array}$$

$$40/3 = 280 - 800/3 \quad \frac{260}{3} - \frac{800}{3} - 180$$

$$40/3 = 260/3$$

$$2:13;;$$

$$\therefore \left\{ \begin{array}{l} \text{S.P} = \text{C.P} \times 120/100 \\ \text{C.P} = \text{S.P} \times 100/120 \end{array} \right\}$$

$$\therefore \left\{ \begin{array}{l} \text{In Allegation C.P is} \\ \text{compared with only} \\ \text{C.P} \end{array} \right\}$$

Q. 29m which ratio Darjeeling tea which costs 32 ₹/kg mixed with Assam tea which costs 25 ₹/kg. so mixed tea is sold at 32.4 ₹/kg with 20% Profit?

sol:

$$\begin{array}{ccc}
 32 & & 25 \\
 & \diagdown & / \\
 27 = & 32.4 \times 100 / 120 & \\
 & / & \diagdown \\
 27-25 & & 32-27 \\
 & & 2:5 //
 \end{array}$$

Q. 30m which ratio 192 ₹/kg tea and 150 ₹/kg should be mixed so it is sold at 194.4 ₹/kg with 20% profit?

sol: 2 : 5

#### C. P. AND M. R. P. RATIO QUESTIONS:

Q. 31 A person gives the 10% discount on M. R. P. and earn 12% profit. Then what is the ratio of C. P. and M. R. P.?

sol:

$$\text{Basic M.R.} \left( \frac{100-10}{100} \right) = \text{SP} - (1) \quad \frac{\text{C.P.}}{\text{M.R.P}} = \frac{90}{112} = 45/56$$

$$\text{MRP} \times 90/100 = \text{SP}$$

$$\text{C.P.} : \text{M.R.P}$$

$$\text{CP} \times \left( \frac{100+12}{100} \right) = \text{S.P}$$

$$45 : 56$$

Trick CP : MRP

$$(100-d\%) : (100 \pm P/2\%)$$

$$(100-10) : (100+12)$$

$$90 : 112$$

$$45 : 56$$

$$\text{C.P} \times \frac{112}{100} = \text{S.P} - (2)$$

$$\text{Eqn(1)} = \text{Eqn(2)}$$

$$\text{MRP} \times 90/100 = \text{CP} \times 112/100$$

Q. 32 A trader gives 15% discount on marked price. so to get 19% profit, at what percent above the C. P. should be marked?

sol:

$$\begin{array}{l} \text{C.P.} \quad ; \quad \text{M.R.P.} \\ (100-15) \quad ; \quad (100+19) \end{array}$$

$$85 \quad ; \quad 119$$

$$5 \quad \underbrace{\quad : \quad 7}_{2} = \frac{2}{5} \times 100 = 40\% \text{ Above.}$$

Q. 33 A person gives 10% discount on marked price and earn 8% profit then by much percent is M. P. higher than C. P.?

sol: 20 % higher

Q. 34 A watch seller buys a watch in ₹ 500 with additional times that are 10%. if he gives 25% discount on M. R. P., he still manages to get 20% Profit. Then what is marked price?

sol: 880

### DISCOUNT IN QUANTITY

Q. 35 An advertisement outside the shop is buy 2 get 3 free then what is actual discount in %?

sol: cost for the shopkeeper of 5 product is =  $5x$

If cost is  $x$  ₹ per product

then discount is =  $3x$

$$\text{So, discount \%} = \frac{3x}{5x} \times 100 = 60\%$$

Q. 36 what is discount rate at buy 4 get 5 free?

sol: 55.55 % DISCOUNT



Q. 37 A shopkeeper gives 3 articles free on buying 5 articles and he give 20% discount and still manages to get 25% profit. what is ratio C. P. and M. R. P. of a single article?

sol: 2:3

When value of C.P and P/2 % is same.

Q. 38 A shopkeeper gives 1 article free on the sell at 15 articles and he gives 4% extra discount, he still earns 35% profit. what is ratio of C. P. and M. R. P. of a single article?

sol: 2 : 3

**WHEN VALUE OF C. P. AND P / L IS SAME:**

Q. 39 A trader sells an article in ₹ 75 and C. P. at that article is equal to profit %. what is C. P.?

sol: let C.P is  $x$  ₹  $x = 50$ ;  $x = -150x$

$$150 \times x \left( \frac{100+x}{100} \right) = 75$$

$$x(100+x) = 7500$$

$$x^2 + 100x - 7500 = 0$$

$$x^2 + 150x - 50x - 7500 = 0$$

$$x(x+150) - 50(x+150) = 0$$

$\therefore \left\{ \begin{array}{l} \text{C.P. can't be in negative} \end{array} \right\}$

Q. 40 A trader sells an article in ₹ 39 and value of C. P. of that article is equal to Profit%. what is C. P.?

sol: 30

Q. 41 A trader sells an article in ₹ 56 and value of C. P. of that article is equal to profit%. what is P%?

sol: 40 %