1. The profit obtained  by  selling  an  article  for  Rs.  56  is  the  same  as  the  loss  obtained  by  selling  it  for  Rs.  42.  What  is  the  cost  price  of  the  article?

a. Rs. 40

b. Rs. 50

c. Rs. 49

d. None of  these

2. The  C.P  of  21  articles  is  equal  to  S.P  of  18  articles.  Find  the  gain or  loss  percent.

a. 10%

b. 18 1/3%

c. 16 2/3

d. 20%

3. An  article  is sold  at  a  certain  price.  By  selling it  at  2/3  of  that  price  one  loses  10%.  Find  the  gain  percent  at  original  price.

a. 15%

b. 35%

c. 25%

d. 50%

4. A  man  bought  a  horse  and  a  carriage  for  Rs.  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.

a. 2200

b. 1800

c. 1200

d. 1000

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

a. 10%

b. 22%

c. 18%

d. 12%

6. At  what  percentage  above  the  C.P  must  an  article  be  marked   so  as  to  gain  33%  after  allowing  a  customer  a  discount  of  5%?

a. 38%

b. 40%

c. 43%

d. 48%

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

a. Rs. 19

b. Rs. 20.5

c. Rs. 17.4

d. Rs. 21.6

8.  On  an  article ,the  manufacturer  gains 10%,  the   wholesale   dealer   15%,  and  the  retailer  25%,  If  its  retail  price   is  1265,  what  is  the  cost  of  its  production?

a. 1000

b. 800

c. 1100

d. 900

9.  A  dealer  professing  to  sell  his  goods  at  cost  price,  uses  900gm  weight  for  1 kg.  His  gain  percent  is

a. 13%

b 12 1/3%

c. 11 1/9%

d.10%

10. A  trader  has  50 kg  of  rice,  a  part  of  which  he  sells  at  14%  profit  and  rest  at  6%  loss.  On  the  whole  his  loss  is  4% .  What  is  the  quantity  sold  at  14%  profit   and  that  at  6%  loss?

a.  5  and  45  kg

b. 10 and  40  kg

c. 15 and  35 kg

d. 20 and  30 kg

11. The  cost  price  of  two  types  of  tea  are  Rs.  180  per kg  and  Rs.  200       per  kg  respectively. On mixing  them  in  the  ratio  5:3, the  mixture is  sold  at  Rs. 210  per  kg .  In  the  whole  transaction,  the  gain  percent  is

a. 10%

b. 11%

c.  12%

d.  13%

12. A  trader  marks  his  product  40%  above  its  cost. He  sells  the  product  on  credit  and  allows  10%  trade  discount. In order  to ensure  prompt   payment, he  further  gives  10%  discount  on  the  reduced  price.  If  he  makes  a  profit  of  Rs. 67  from  the  transaction,  then  the  cost  price  of  the  product  is

a. Rs. 300

b. Rs. 400

c. Rs. 325

d. Rs. 500

13. A  retailer sold  two  articles  at  a  profit  percentage  of  10%  each. The  cost  price  of  one  article  is  three – fourth  that  of  the  other.  Find  the  ratio of  the  selling  price  of  the  dearer  article  to  that  of  the  cheaper  one

a 4:3

b.3:4

c.41:31

d.51:41

14. If  the  S.P  of   Rs.  24  results  in  a  20%  discount  on  the  list  price,  What  S.P  would  result  in a 30%  discount  on  the  list  price?

a. Rs. 27

b. Rs..21

c. Rs.20

d. Rs. 9

15.  Anil  bought  a  T.V  with  20%  discount  on  the  labeled  price .  Had  he  bought  it  with  25%  discount, he  would  have  saved  Rs. 500. At  what  price  did  he  buy  the  T.V?

a. Rs. 16000

b. Rs. 12000

c. Rs. 10000

d. Rs. 5000

16.  A  single  discount  equivalent  to  a  series  of  30%, 20%, and  10%  is

a.50%

b. 49.6%

c.  49.4%

d. 51%

17. Ramya  sells  an  article  at  three- fourth  of  its  list  price  and  makes  a  loss  of  10%.  Find  the  profit  percentage  if  she  sells  at  the  list  price.

a.20%

b.25%

c.15%

d. None  of  these

18. The  ratio  of  the  selling  prices  of  three  articles  is  5:6:9  and  the  ratio  of  their  cost  prices  is  4:5:8  respectively.  What  is  the  ratio  of  their  respective  percentages  of  profit,  if  the  profit  on  the  first  and  the  last  articles  is  the  same?

a. 4:5:6

b. 10:8:5

c.  5;6;9

d.  Cannot  be  determined

19. With  the  money  I  have , I can  buy  50  pens  or  150  pencils.  I kept  10%  aside  for  taxi  fare.   With  the  remaining  , I  purchased  54 pencils  and  P  pens.  What  is  the  value  of  P?

a. 32

b. 30

c. 27

d. None  of  these

20. The  selling  price  of  13  apples  is  the  same  as  the  cost  price  of  26  mangoes .  The  selling  price  of  16  mangoes  is  the  same  as  the  cost  price  of  12  apples.  If  the  profit  on selling  mangoes is 20%,  What  is  the  profit  on  selling  apples?

a. 20%

b.25%

c.40%

d. Cannot  be  determined

**Answer & Explanations**

1. Exp.  S.P 1- C.P  =  C.P – S.P 2

    56 -  C.P =  C.P -  42

    2 C.P =  56 + 42;

    C.P =    98/2  = 49

2. Exp.  Let  C.P  of  each  article  be  Re.  1.

    Then  C.P  of  18  articles  =   Rs.  18,

    S.P  of  18  articles  =   Rs.  21.

    Gain %  =  ( 3/18 \* 100 ) %  =  16 2/3

3. Exp.  Let  the  original  S.P be  Rs. X.  Then  new  S.P  =  Rs.  2/3 X,  Loss  =10%

    So  C.P   = Rs. [100/90\*2/3 X  ] =  20 X/27.

    Now  C.P  =  Rs.  20X/27,  S.P  =Rs. X,  Gain  =  Rs. [ X  -20X/27 ]  =Rs.7X/27.

    Gain  %  = [ 7X/27 \*27/20X \*100 ]%   =35%

4. Exp.Let the C.P of  the horse  be  Rs. X, Then,  C.P  of  the  carriage = Rs.(3000- x).

    20%  of   x  -  10%  of  (  3000-x  )  =2%  of  3000  =  60,

    x/5  -   (  3000-x  )/10  =  60,   3x  - 3000  =  600,  3x  =3600,  x  =  1200.

    Hence,  C.P  of  the  horse  =  Rs. 1200

5. Exp.  Let  the  original  price  of  the  jewel  be  Rs. P  and  let  the  profit  earned  by  the  third  seller   
    be  x%.

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

     [ ( 100+x )/100\*125/100\*120/100\* P ]  =  [ 165/100\* P ]

     (  100 + X  )  =     165\*100\*100    =  110,     X  =  10%.

                                   125\*120

6.  Exp.  Let   C.P  =  Rs. 100,   Then   S.P  =  Rs.133.

     Let  the  marked  price  be   x

     Then ,  95%  of  x  =   133,   95 x/ 100  =133,  x  = 133\*100/95  =140

     Marked   price  =  40%  above   C.P

7. Exp.  C.P  OF  200 kg  of  mix  =  Rs.[ 80\*13.50+120\*16 ] =Rs.3000

    S.P =116%  of  Rs.3000  = Rs.      116/100\*3000   =  3480

    Rate  of  S .P   of  the  mixture   =  Rs. [ 3480/200]  per  kg

                                                  =  Rs.  17.40  per  kg

8. Exp.   110/100\*115/100\*125/100\*C.P   =1265,  11/10\*23/20\*5/4 C.P  =1265

    C.P  =   800

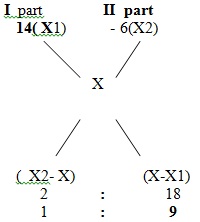
9. Exp.  Gain %  =              Error      \*100      %

                      (  True value) - Error

                       =     1000gm  -900gm \* 100   %   =  100/900\*100%  =  100/9

                                         1000 -100

                       =   11 1/9 %

10. Exp.  Alligation   Method  
      

         Ratio  of  quantities  sold  at  14%  profit  and  6%  loss  =   1:  9

         Quantity  sold  at  14%  profit    =  50/1+9  \*1  =  5 kg

         Quantity  sold  at  6%  loss         =  50/1+9   \*9 =  45kg

11. Exp.  Let  5kg  of  first  kind  of  tea  be  mixed  with  3  kg  of  second  kind

      C.P  of  8  kg  of  tea  =  Rs. ( 180\*5 + 200\*3 )  =  Rs.  1500

     S.P  of   8 kg  of  tea  =  Rs.  (210 \* 8)   =  Rs.  1680

      Gain   =   Rs.   (  1680 – 1500 )  =  Rs.  180

     Gain% =  ( 180/1500\*100 )%  = 12%

12. Exp. M.P  = C.P \*1.4

      Profit  =  S.P -  C.P  =  C.P ( 1.4 ) ( 0.9 ) ( 0.9 ) – C.P  = 67

                                              C.P ( 1.134 – 1 )  =  67,  C.P  =  500

13.  Exp. Let  C.P  of  one  of  the  article  be  X,  Then  C.P  of  the  other  = ¾X,

       S.P 1 = 11X/10,  S.P2  =3/4\*11/10X,

      S.P1/S.P2   =  11X/10 \*40/33X  = 4/3

      S.P1: S.P2 =    4 : 3

14. Exp.  Let  the  list  price  be  Rs.  X,

     80/100\*x   =  24,   x  =  24\*100/80  =  30

     Required  S.P  = 70%  of  Rs. 30  = 70\*30/100  =21

15. Exp.  Let  the  labelled  price  be  Rs. X,

      S.P  =  80/100\*X  =4X/5

      New  S.P  =  75/100\*X  =  3X/4

      4X/5 –3X/4   500,  X  =  10000

16. Exp.  Let  the  marked  price  be Rs. 100

      Then  S.P  =  90% of 80% of  70% of  100

        = ( 90/100\*80/100\*70/100\*100 ) =50.4

        Single  discount  =  ( 100- 50.4 )%  =  49.6%

17.  Exp. Let  the  list  price  be  x,

      S.P  =3/4X,  S.P  =  (100 – loss%) /100\*C.P =  0.9 C.P

       3/4x  =0.9C.P,  C.P  =3X/3.6

       If  S.P = X,  Profit %  = (x- 3x/3.6 ) / ( 3x/3.6 ) \*100=  60/3 = 20%

18. Exp.  Given  that  the  selling  prices  of  three  articles,

      S.P1 =5X, S.P2  =6X,  S.P3 =9X,

      And  their  cost  prices  are  C.P1  =4Y,  C.P 2 =5Y, C.P3 =8Y

      Given  that , S.P1 –C.P1 =S.P2 –C.P2, 5X-4Y =9X-8Y,   X =Y,

      Their  profit  percentages  are, p1 =(5-4)/4\*100 = 25% ,

      p2 = (6-5)/5\*100 = 20%, p3 = (9-8)/8\*100 = 12 1/2%

      Ratio  of  the  percentages is  25:20:12 1/2 = 10:8:5

19. Exp.  Since  cost  of,  50 pens  =  150  pencils,  With  the  cost  of  3 pencils  I can  buy  1 pen.  After   
     putting  aside  10%  for  taxi   I  was  left  with  90%  of  the  money  ,  with  which  I  can  buy   135  
     pencils (90% of 150) or 45(90% of 50)  pens,   I  bought  54  pencils  and  P  pens,  or  I  could  have   
     bought  ( 54 +3P ) pencils ,

                                       54 +3P  =135,   3P = 135-54 =81,  P  =27

20. Exp. Given  that  S.P  of  13  apples  =  C.P  of 26  mangoes

      S.P of  an  apple  =  2\*C.P  of  the  mango

      S.P  of  16  mangoes  =  C.P  of  12  apples

      C.P  of  the  apple     =  4/3  \*S.P  of  the  mango

                                               Mango                           Apple

                                       C.P       x                                 4/3\*y

                                        S.P       y                                  2x

                                        Given  that  y  =  1.2x

                                        C.P  of  apple  =   4/3\*1.2x  =1.6x

                                       Profit  on  each  apple = (S.P – C.P)/C.P\*100,

                                                                           = (2x –1.6x)/1.6\*100 = 0.4/1.6 \*100 =25%

**Important formula and Equations**

Gain= SP-CP  
Loss= CP-SP  
Gain Percentage= (Gain\*100)/ CP  
Loss Percentage= (Loss\*100)/ CP  
Selling Price=((100+Gain %)/100)\*CP or ((100-Loss%)/100)\*CP  
Cost Price= (100\*SP)/(100+Gain%) or (100\*SP)/(100-Loss%)

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:

Loss %= (Common loss ans gain %)2/10 = (x/10)2

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

Gain%=((Error)/(True value)-(Error))\*100%

**Key Notes**

When an article is sold at a profit of x%. If it would be sold for Rs.n less, there would be a loss of y%, then the cost price of the article CP=(n\*100)/(x+y)

A man sells an article at a gain of x%. If it would have been sold for Rs.n more, there would have a profit of y%, then CP= (n\*100)/(y-x)

A person brought two articles for Rs.n. On selling one article at x% profit and other at y% profit, he get the same selling price of each, then  
CP of first article= Rs. (100+y)n/200+x+y

CP of second article= Rs. (100+x)n/ 200+x+y

When m articles are brought for Rs.n and n articles are sold for Rs.m and m>n, then profit%= ((m2-n2)\*100)/n2  
If A sells an article to B at a profit of r1 %, B sells it to C at a profit of r2 % and C sells it to D at a profit of r3 %, then, cost price of D= Cost Price of A (1+r1/100)(1+r2/100)(1+r3/100)

If A sells an article to B at a loss of r1 %, B sells it to C at a loss of r2 % and C sells it to D at a loss of r3 %, then, cost price of D= Cost Price of A (1-r1/100)(1-r2/100)(1-r3/100)

A dealer purchases a certain number of articles at x articles for a rupee and the same number at y articles for a rupee. He mixes them together and sells at z articles for a rupee.  
Then his gain or loss %=([2xy- 1]/z(x+y))\*100; according to positive or negative sign.

If P1 is rate gain w.r.t. selling price S1 and P2 is rate gain w.r.t. selling price S2  
Then CP=(100/P1-P2)\* difference between selling prices

If P1 is rate gain w.r.t. selling price S1 and P2 is rate loss w.r.t. selling price S2  
Then CP= (100/ P1+P2) \* difference between selling prices

When a man sells two things at the same price each and in this process his loss on first thing is x% and gain on second thing is x%, then in such a type question, there is always a loss and  
Loss= 2\*SP/((100/x)2 -1)

When a man buys two things on equal price each and in those things one is sold on the profit of x% and another is sold on the loss of x%, then there is no loss or no gain percent.  
A sells an article at a profit of r1 % to B and B again sells it to C at a profit of r2 %. If C pays Rs. P to B, then CP of the article for  
A= Rs. 100\*100\*P/(100+r1)(100+r2)

When a shopkeeper on selling an article for Rs.n, gains as much percent as the cost price of it,then CP of the article  [http://p3.placement.freshersworld.com/power-preparation/sites/default/files/untitled%20SP.JPG](http://p3.placement.freshersworld.com/power-preparation/sites/default/files/untitled%20SP.JPG)

If there is loss in place of profit,  
then CP of the article=   [http://p3.placement.freshersworld.com/power-preparation/sites/default/files/untitledSP2.JPG](http://p3.placement.freshersworld.com/power-preparation/sites/default/files/untitledSP2.JPG)

If two articles are sold at the same price (i.e., the selling prices are equal) and the magnitude of percentage of profit x on one article is the same as the magnitude of percentage of loss x on the second article, then there is an overall loss and the percentage of loss is x2/100.

If a shopkeeper claims to sell the goods at cost price and gives x units less than the actual weight, then the profit percentage made by the shopkeeper is [x / actual weight  x] x 100.

In the above case, the error percentage = [x / actual weight] x 100

If two articles are bought for the same price (i.e., the cost prices are equal) and one is sold at a profit of p1% and the second is sold at a profit of p2%, then the overall percentage of profit is ((p1 + p2 )/2) x 100

If the selling price of m articles is equal to cost price of n articles, where m > n, then profit percentage is ((m  n )/m)x 100.  
If m < n, then loss percentage = ((n  m)/m) x 100.

**Discount**

Discount% = Discount / Marked price \* 100%

An article sold at selling price(SP1) at a loss of x% is to be sold at selling price(SP2) to gain y%, then SP2 = SP1(100 + y)/ (100-x)

If selling an object for Rs.x a person loses a certain sum and selling for Rs.y he gains the same amount, CP is given by CP = (x+y)/2.

When the price of an article is reduced by p% a man can buy x quantity of the article for Rs.y then  
reduced price = 1/x ( y \* p / 100) per unit.  
original price = reduced price \* 100 / (100 - p).

If the MP (marked price) of an article above CP is M% and after allowing a discount of d%, the gain is g%,  
Then M% = d+g \* 100% / 100 - d, and if there is a loss of l%, then M% = d-l \* 100% / 100-d.

A person sells goods at a profit of x%. Had he sold it for Rs. X more, y% would have been gained. Then CP is given by Rs. X \*100 / y-x.

A person sells goods at a loss of x%. Had he sold it for Rs. X more, he would have gained y% . Then CP is given by Rs. X \* 100/ y+x.

When there are two successive profits of x% and y% the net gain% is given by: Net gain = [ x + y + { xy / 100 }]%.

When there are two successive losses of x% and y% the net loss% is given by: Net loss = [ - x - y + { xy / 100 }]%.10)

When there is a gain of x% and a loss of y% the net effect is given by: Net effect = [ x - y - { xy / 100}]%.

l. If d1, d2, d3.. are percentages of successive discounts on a marked price MP, then the selling price SP = MP (1  d1/100) (1  d2/100) (1  d3/100)

2. If d1, d2, d3. are the percentages of successive discounts offered, then the effective discount is d% = 100[1- (1  d1/100) (1  d2/100) (1  d3/100)]

3. If x and y are two successive discount percentages, then it is equivalent to a single discount percentage of x + y  xy/100.

Profit=SP-CP  
Loss=CP-SP  
Profit %= ((SP-CP)/CP) \*100  
Loss %= ((CP-SP)/ CP) \*100  
Discount= MP-SP  
Discount %= ((MP-SP)/ MP) \* 100  
where SP= Selling Price, CP= Cost Price, MP= Marked Price

**Exercise questions**

1. A trader makes a profit equal to the selling price of 75 articles when he sold 100 of the articles. What % profit did he make in the transaction?  
A) 33.33%              
B) 75%               
C) 300%              
D)150%

2. A merchant buys two articles for Rs.600. He sells one of them at a profit of 22% and the other at a loss of 8% and makes no profit or loss in the end. What is the selling price of the article that he sold at a loss?  
A) Rs. 404.80              
B) Rs.440              
C) Rs. 536.80                         
D) Rs. 160

3. A trader professes to sell his goods at a loss of 8% but weights 900 grams in place of a kg weight. Find his real loss or gain per cent.  
A) 2% loss          
B) 2.22% gain      
C) 2% gain          
D)None of these

4. Rajiv sold an article for Rs.56 which cost him Rs.x. If he had gained x% on his outlay, what was his cost?  
A) Rs. 40             
B) Rs. 45        
C) Rs. 36        
D)Rs. 28

5. A trader buys goods at a 19% Amount on the label price. If he wants to make a profit of 20% after allowing a Amount of 10%, by what % should his marked price be greater than the original label price?  
A) +8%             
B) -3.8%    
C) +33.33%             
D) None of these

6. If apples are bought at the rate of 30 for Rs.100.  How many apples must be sold for Rs.100 so as to gain 20%?  
A) 28           
B)25                
C) 20               
D) 22

7. One year payment to the servant is Rs. 200 plus one shirt.  The servant leaves after 9 months and receives Rs. 120 and a shirt. Then find the price of the shirt.  
A) Rs. 80  
B) Rs. 100  
C) Rs. 120   
D) Cannot be determined

8. Two merchants sell, each an article for Rs.1000. If Merchant A computes his profit on cost price, while Merchant B computes his profit on selling price, they end up making profits of 25% respectively. By how much is the profit made by Merchant B greater than that of Merchant A?  
A) Rs.66.67  
B) Rs. 50             
C) Rs.125             
D) Rs.200

9. A merchant marks his goods in such a way that the profit on sale of 50 articles is equal to the selling price of 25 articles. What is his profit margin?  
A) 25%             
B)50%             
C) 100%             
D)66.67%

10. A merchant marks his goods up by 75% above his cost price. What is the maximum % Amount that he can offer so that he ends up selling at no profit or loss?  
A)75%             
B) 46.67%             
C) 300%             
D)42.85%

**Answer Key**

1.C; 2.A; 3.B; 4.A; 5.A; 6.B; 7.C; 8.B; 9.C; 10.D