PROFIT AND LOSS PROBLEMS WITH SOLUTIONS

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Profit and loss

Profit and loss problems involves various terms like cost price, selling price, marked price etc. Basically, it is a difference between selling price and cost price. Cost price is the price paid to purchase an article or a product or we can say it is a cost incurred in manufacturing an article. Selling price is the price at which a product is sold.

Various profit and loss formulas used in profit and loss:

1) Generally, profit is calculated as:
Profit or gain = Selling price(S.P) - Cost price (C.P)

2) Similarly, Loss = Cost price - Selling price

3) Gain percentage(%) = $\dfrac{Gain}{C.P.} \times 100$

4) Loss percentage(%) = $\dfrac{Loss}{C.P.} \times 100$

5) There is a direct relationship between selling price and cost price:

$$S.P. = \dfrac{100 + Gain\ percentage}{100} \times C.P. \text{ (In case of gain)}$$

$$S.P. = \dfrac{100 - Loss\ percentage}{100} \times C.P. \text{ (In case of loss)}$$

Example 1:

If an article is sold at gain of 27%, then by using first formula, you can find that S.P. is 127% of C.P.

Similarly, If an article is sold at loss of 18%, then by using second formula, you can find that S.P. is 82% of C.P.

6) If a person sells two commodities at same prices. On one he gains x% and loses x% on another, then as a whole he will be in loss and the loss percentage will be equal to:

$$\dfrac{(Common\ gain\ or\ loss\ percentage)^2}{100} = \dfrac{x^2}{10}$$

Example 2:

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.

Solution:

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

$\dfrac{x}{5}\ \dfrac{3000 - x}{10} = 60$

2x - 3000 + x = 600

3x = 3600

x = 1200

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

Note: Here is an example to find gain in case of dishonesty.

Problem 1: A dishonest dealer professes to sell his goods at cost price but he uses a weigh 960 grams for 1 kg. How to calculate gain percentage?

Solution:

$$\text{Gain percentage} = \frac{\text{Error}}{\text{True value - Error}} \times 100 = \frac{40}{960} \times 100 \ (\text{Ans in \%})$$

PROBLEMS

1) A man buys a cycle for Rs.1400 and sells it at a loss of 15%. What is the selling price of the cycle?
   a) Rs.1090   b) Rs.1160   c) Rs.1190
   d) Rs1202   e) None of these

2) When a commodity is sold for Rs.34.80. there is a loss of 25%. What is the cost price of the commodity?
   a) Rs.26.10   b) Rs.43   c) Rs.43.20
   d) Rs.46.40   e) None of these

3) Sam purchased 20 dozens of toys at the rate of Rs.375 per dozen. He sold each one of them at the rate of Rs.33. What was his percentage profit?
   a) 3.5   b) 4.5   c) 5.6
   d) 6.5   e) None of these

4) A fruit seller sells mangoes at the rate of Rs.9 per kg and thereby loses 20%. At what price per kg, he should have sold them to make a profit of 5%?
   a) Rs.11.81   b) Rs.12   c) Rs.12.25
   d) Rs.12.31   e) None of these

5) A shopkeeper give 12% additional discount on the discounted price, after giving an initial discount of 20% on the labeled price of a radio. If the final sale price of the radio is Rs.704, then what is its labeled price?
   a) Rs.844.80   b) Rs.929.28   c) Rs.1000
   d) Rs.1044.80   e) None of these

6) A man sells two flats at the rate of Rs.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   e) None of these

7) Peter purchased a machine for Rs.80,000 and spent Rs.5000 on repair and Rs.1000 on transport and sold it with 25% profit. At what price did he sell the machine?
   a) Rs.1,05,100   b) Rs.1,06,250   c) Rs.1,07,500
   d) Rs.1,17,500   e) None of these

8) A shopkeeper expects a gain of 22-$\frac{1}{2}$ % on his cost price. If in a week, his sale was of Rs.392, what was his profit?
   a) Rs.18.20   b) Rs.70   c) Rs.72
   d) Rs.88.25   e) None of these

9) By selling a pen for Rs.15, a man loses one sixteenth of what it costs him. The cost price of the pen is
   a) Rs.16   b) Rs.18   c) Rs.20
   d) Rs.21   e) None of these

10) A shopkeeper professes to sell his goods at cost price but uses a weight of 800 gm instead of kilogram weight. Thus, he make a profit of
    a) 20%   b) 22%   c) 25%
    d) Data inadequate   e) None of these

11) 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

12) If a man reduces the selling price of a fan from Rs.400 to Rs.380, his loss increases by 2%. The cost price of the fan is
    a) Rs.480   b) Rs.500   c) Rs.600
    d) Rs.1000   e) None of these

13) 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%   e) None of these

14) Kunal bought a suitcase with 15% discount on the labeled price. He sold the suitcase for Rs.2880 with 20% profit on the labeled price. At what price did he buy the suitcase?
    a) Rs.2040   b) Rs.2400   c) Rs.2604
    d) Rs.2640   e) None of these

15) I gain 70 paise on Rs.70. My gain percent is
    a) 0.1%   b) 1%   c) 7%
    d) 10%   e) None of these

16) A book was sold for Rs.27.50 with a profit of 10%. If it were sold for Rs.25.75, then what would have been the percentage of profit or loss?
a) 2%   b) 3%   c) 4%
d) 5%   e) None of these

17) A shopkeeper buys 100 eggs at Rs.1.20 per piece. Unfortunately 4 eggs got spoiled during transportation. The shopkeeper sells the remaining eggs at Rs.15 a dozen. Find his profit or loss?
a) Rs.120   b) 102   c) 201
d) 121   e) None of these

18) Find the cost price of an article which is sold for Rs.220 at a loss of 12%
a) Rs.225   b) 250   c) 165
d) 260   e) None of these

19) If the cost price of an article is Rs.300 and the percent markup is 20%. What is the marked price?
a) 375   b) 390   c) 360
d) 310   e) None of these

20) By selling 18 chocolates, a vendor loses the selling price of 2 chocolates. Find his loss percent?
a) 15%   b) 5%   c) 8%
d) 10%   e) None of these

21) A dealer by selling 12 oranges gets the cost price of 15 oranges. What is the percentage profit?
a) 25%   b) 15%   c) 18%
d) 20%   e) None of these

22) If the cost price of 15 apples, is same as the selling price of 20 apples. What is the gain or loss percent?
a) 15%   b) 25%   c) 23%
d) 16%   e) None of these

23) The CP of 21 articles is equal to SP of 18 articles. Find the gain or loss percent?
a) 17%   b) $16\frac{2}{3}$%   c) 18%
d) 20%   e) None of these

24) Find the single discount equivalent to a series discount of 20%, 10% and 5%.
a) 31.6%   b) 32%   c) 27%
d) 30%   e) None of these

25) A vendor bought bananas at 6 for Rs.10 and sold them at 4 for Rs.6. Find his gain or loss percent?

a) 13%   b) 15%   c) 10%
d) 22%   e) None of these

26) A dealer sold three-fourth of his articles at a gain of 20% and the remaining at cost price. Find the gain earned by him in the whole transaction.
a) 18%   b) 22%   c) 15%
d) 25%   e) None of these

27) A grocer purchased 80 kg of sugar at Rs.13.50 per kg and mixed it with 120 kg sugar at Rs.16 per kg. At what rate should he sell the mixture to gain 16%
a) Rs.19 per kg   b) Rs,25 per kg   c) Rs.17.40 per kg
d) Rs.19.40 per kg   e) None of these

28) 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?
a) 10%   b) 18%   c) 15%
d) 16%   e) None of these

29) A tradesman sold an article at a loss of 20%. If the selling price had been increased by Rs.100, there would have been a gain of 5%. What was the cost price of the article?
a) Rs.600   b) Rs.700   c) Rs.300
d) Rs.400   e) None of these

30) A trader sells two articles, one at a loss of 10% and another at a profit of 15% but finally there is no loss or gain. If the total sale price of these two articles is Rs.30,000, find the difference between their cost prices:
a) Rs.5000   b) Rs.6000   c) Rs.7500
d) Rs.8800   e) None of these

31) A shopkeeper sold an article for Rs.2090.42. Approximately, what will be the percentage profit if he sold that article for Rs.2602.58?
a) 15%   b) 20%   c) 25%
d) 30%   e) None of these

32) A man bought 18 oranges for a rupee and sold them at 12 oranges for a rupee. What is the profit percentage?
a) 33.33%   b) 50%   c) 66.66%
d) 48%   e) None of these

33) A retailer bought 20 kg tea at a discount of 10%. Besides 1 kg tea was freely offered to him by the wholesaler at the purchase of 20 kg tea. Now he sells all the tea at the marked price to a customer. What is profit percentage of retailer?
a) 30%   b) 12%   c) 16.66%
d) 25%   e) None of these

34) Each of A and B sold their article at Rs.1818 but A incurred a loss of 10% while B gained by 1%. What is the ratio of cost price of the articles of A to that of B?
a) 101 : 90   b) 85 : 89   c) 81 : 75
d) 75 : 81   e) None of these

35) Abhinav saves Rs.25 by getting 6.66% discount on a textbook. What is the amount of money (in Rs.) paid by him?
a) 450   b) 350   c) 225
d) 375   e) None of these

36) A trader sells goods to a customer at a profit of k% over the cost price, besides it he cheats his customer by giving 880 g only instead of 1 kg. Thus, his overall profit percentage is 25%. Find the value of k?
a) 8.33%   b) 8.25%   c) 10%
d) 12.52%   e) None of these

37) DSNL charges a fixed rental of Rs.350 per month. It allows 200 calls free per month. Each call is charged at Rs.1.4 when the number of calls exceeds 200 per month and it charges Rs.1.6 when the number of calls exceeds 400 per month and so on. A customer made 150 calls in February and 250 calls in March. By how much percent the each call is cheaper in March than each call in February?
a) 28%   b) 25%   c) 18.5%
d) Data inadequate   e) None of these

38) Pratibha printers prepares diaries expecting to earn a profit of 40% by selling on the marked price. But during transportation 8% diaries were got spoiled due to at random rain and 32% could be sold only at 75% of the cost price. Thus the remaining 60% diaries could be sold at the expected price. What is the net profit or loss in the whole consignment?
a) 6%   b) 10%   c) 8%
d) Data inadequate   e) None of these

39) At kul-kul petrol pump the operator gives 5% less petrol but he sells it at the cost price. What is his profit in this way?
a) 5%   b) 5.6%   c) 5.26%
d) 4.78%   e) None of these

40) A bookseller procures 40 books for Rs.3200 and sells them at a profit equal to the selling price of 8 books. What is the selling price of one dozen books, if the price of each book is same?
a) 720   b) 960   c) 1200
d) 1440   e) None of these

41) Rahul went to purchase a Nokia mobile handset, the shopkeeper told him to pay 20% tax if he asked the bill. Rahul manages to get the discount of 5% on the actual sale price of the mobile and he paid the shopkeeper Rs.3325 without tax. Besides he

manages to avoid to pay 20% tax on the already discounted price, what is the amount of discount that he has gotten?

a) 750   b) 375   c) 875

d) 525   e) None of these

42) Rotomac produces very fine quality of writing pens. Company knows that on an average 10% of the produced pens are always defective so are rejected before packing. Company promises to deliver 7200 pens to its wholesaler at Rs.10 each. It estimates the overall profit on all the manufactured pens to be 25%. What is the manufacturing cost of each pen?

a) Rs.   b) Rs.7.2   c) Rs.5.6

d) Rs.8   e) None of these

43) A merchant earns 25% profit in general. Once his 25% consignment was abducted forever by some goondas. Trying to compensate his loss he sold the rest amount by increasing his selling price by 20%. What is the new percentage profit or loss?

a) 10% loss   b) 12.5% loss   c) 12.5% profit

d) 11.11% loss   e) None of these

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

a) $4\frac{4}{7}\%$ b) $5\frac{5}{11}\%$ c) 10%

d) 12%   e) None of these

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

a) Rs.281.75   b) Rs.300   c) Rs.312.50

d) Rs.350   e) None of these

46) If by selling 110 mangoes, the C.P. of 120 mangoes is realized, the gain percent is :

a) $9\frac{1}{11}\%$ b) $9\frac{1}{9}\%$ c) $10\frac{10}{11}\%$

d) $11\frac{1}{9}\%$ e) None of these

47) A man bought some fruits at the rate of 16 for Rs.24 and sold them at the rate of 8 for Rs.18. What is the profit percent?

a) 25%   b) 40%   c) 50%

d) 60%   e) None of these

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

a) 8%   b) 9%   c) 10%

d) 11%   e) None of these

49) A bought a radio set and spent Rs.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 Rs.1188 at a profit of 10%. What is the amount for which A bought the radio set?
a) Rs.850   b) Rs.890   c) Rs.930
d) Rs.950   e) None of these

50) The difference between the cost price and sale price of an article is Rs.240. If the profit is 20%, the selling price is :
a) Rs.1440   b) Rs.1400   c) Rs.1600
d) Rs.1800   e) None of these

51) A businessman sold $\frac{2}{3}$ of his stock at a gain of 20% and the rest at a gain of 14%. The overall percentage of gain to the businessman is :
a) 12%   b) 17%   c) 18%
d) 20%   e) None of these

52) A shopkeeper offers 2.5% discount on cash purchases. What cash amount would Rohan pay for a cycle, the marked price of which is Rs.650?
a) Rs.633.25   b) Rs.633.75   c) Rs.634
d) Rs.635   e) None of these

53) 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%   e) None of these

54) 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 :
a) 5%   b) 9%   c) 16%
d) 25%   e) None of these

55) 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%   e) None of these

56) A dishonest dealer purchases goods at 20% discount of the cost price of Rs. x and also cheats his wholesaler by getting 20% extra through false weighing, per kg. Then he marks up his goods by 80% of x, but he gives a discount of 25% besides he cheats his customer by weighing 10% less than the required. What is his overall profit percentage?
a) 125%   b) 100%   c) 98.66%
d) 120%   e) None of these

57) Titan sells a wrist watch to a wholesaler making a profit of 10%. The wholesaler, in turn, sells it to the retailer making a profit of 10%. A customer purchases it by paying Rs.990. Thus, the profit of retailer is $2\frac{3}{11}$%. What is the cost incurred by the Titan to produce it?

a) 768   b) 750   c) 800

d) 820   e) None of these

Solutions:

1.   Option C

S.P. $= 85\%$ of Rs.1400

                  $= \text{Rs.}\left[\frac{85}{100} \times 1400\right]$

                  $= \text{Rs.}1190$

2.   Option D

C.P. $= \text{Rs.}\left[\frac{100}{75} \times 34.80\right]$

                  $= \text{Rs.}46.40$

3.   Option C

C.P. of toy $= \text{Rs.}\left[\frac{375}{12}\right]$

                         $= \text{Rs.}31.25$

S.P. of 1 toy $= \text{Rs.}33$

Therefore, profit $= \left[\frac{1.75}{31.25} \times 100\right]\%$

                         $= \left[\frac{28}{5}\right]\%$

                         $= 5.6\%$

4.   Option A

$85 : 9 = 105 : x$

$x = \left[9 \times \frac{105}{80}\right]$

$= \text{Rs.}11.81$

Hence, S.P. per kg $= \text{Rs.}11.81$

5.   Option C

Let the labeled price be Rs.x

88% of 80% of x $= 704$

                                  $x = \left[704 \times 100 \times \frac{100}{88} \times 80\right]$

$$= 1000$$

6.   Option A

Loss % $= (\frac{5}{10})^2\%$
                $= (0.5)^2\%$
                $= 0.25\%$

7.   Option C

C.P. $= Rs.\left[80000 + 5000 + 1000\right]$
                $= Rs.86000$
Profit = 25%
S.P. $= 12.5\%$ of Rs.86000
                $= Rs.\left[\frac{125}{100} \times 86000\right]$
                $= Rs.107500$

8.   Option C

C.P. $= Rs.\left[\frac{100}{122.50} \times 392\right]$
                $= Rs.\left[\frac{1000}{1225} \times 392\right]$
                $= Rs.320$
Therefore, profit $= Rs.(392 - 320)$
                $= Rs.72$

9.   Option A

Let the C.P. be Rs.x. Then x - 15 $= \frac{x}{16}$
                                        $= x - \frac{x}{16} = 15$
                                        $= \frac{15x}{16} = 15$
                                        $x = 16$

Therefore, C.P. = Rs.16

10.   Option C

Therefore, profit $= \left[\frac{200}{800} \times 100\right]\%$
                $= 25\%$

11.   Option A

Let the original price $= Rs.100$

Then, C.P. $= Rs.90$

S.P. = 130% of Rs.90 $= Rs.\left[\frac{130}{100} \times 90\right]$
$= Rs.117$

Required percentage $= (117 - 100)\%$
$= 17\%$

12. Option D

Let C.P. be Rs.x

Then, 2% of x $= (400 - 380)$
$= 20$
$\frac{x}{50} = 20$
$x = 1000$

13. Option A

Let C.P. $= Rs.100$
Then, marked price $= Rs.135$
S.P. $= Rs.108$

Discount % $= \left[\frac{27}{135} \times 100\right]\%$
$= 20\%$

14. Option A

Let the labeled price be Rs.x. Then, 120% of x = 2880

Therefore $x = \left[2880 \times \frac{100}{120}\right]$
$= 2400$

C.P. = 85% of Rs.2400 $= Rs.\left[\frac{85}{100} \times 2400\right]$
$= Rs.2040$

15. Option B

Gain % $= \left[\frac{0.70}{70} \times 100\right]\%$
$= 1\%$

16. Option B

S.P. $= Rs.27.50$
Then profit $= 10\%$

So, C.P. $= Rs.\left[\frac{100}{110} \times 27.50\right]$
$= Rs.25$
When S.P. $= Rs.25.75$

Profit   = Rs.(25.75 - 25)

                        = Rs.0.75

Profit $= \left[\dfrac{0.75}{25} \times 100\right]\%$

                        = 3%

17.   Option A

     Cost price of all eggs $= Rs.100 \times 1.2 = Rs.120$

     Selling price of one egg $= \dfrac{15}{12} = 1.25$

     So, selling price of 96 eggs $= 96 \times \dfrac{15}{12} = Rs.120$

18.   Option B

     SP = Rs.220, Loss = 12%

     Let   CP   = Rs.x

     Then   SP   = 88% of CP

                     $220 = \dfrac{88}{100} \times x$

                     x = 250

     Therefore cost price = Rs.250

19.   Option C

     MP   = CP + % markup on CP

             $= 300 + 300 \times \dfrac{20}{100}$

     MP = Rs.360

20.   Option D

     Let the SP of 1 chocolate   = Rs.1

     SP of 18 chocolates   = Rs.18

     Loss   = Rs.2

     CP   = SP + Loss

            = 18 + 2 = Rs.20

     So, percentage loss $= \dfrac{loss}{CP} \times 100$

            $= \dfrac{2}{20} \times 100 = 10\%$

21.   Option A

     $Profit(\%) = \dfrac{goods\ left}{goods\ sold} \times 100 = \dfrac{15 - 12}{12} \times 100 = 25\%$

22.   Option B

CP of 15 apples = SP of 20 apples

CP × 15 = SP × 20

$\frac{CP}{SP} = \frac{4}{3}$

So, you can see that CP > SP, therefore, there will be loss.

Now consider CP = 4, then SP = 3

So, loss = 1

$$\text{Loss(\%)} = \frac{loss}{CP} \times 100$$
$$= \frac{1}{4} \times 100 = 25\%$$

Loss = 25%

23. Option B

Let CP of each article be Rs.1

Then, CP of 18 articles = Rs.18, SP of 18 articles = Rs.21

So, gain % = $\left[\frac{3}{18} \times 100\right]\% = 16\frac{2}{3}\%$

24. Option A

Let marked price be Rs.100

Then, Net S.P. = 95% of 90% of 80% of Rs.100

$$= \text{Rs.}\left[\frac{95}{100} \times \frac{90}{100} \times \frac{80}{100} \times 100\right] = \text{Rs.}68.40$$

So, required discount = (100 - 68.40) = 31.6%

25. Option C

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

So, C.P. = Rs.$\left[\frac{10}{6} \times 12\right]$ = Rs.20; S.P. = Rs.$\left[\frac{6}{4} \times 12\right]$ = Rs.18

So, Loss% = $\left[\frac{3}{20} \times 100\right]\% = 10\%$

26. Option C

Let C.P. of whole be Rs. x

C.P. of $\frac{3}{4}$th = Rs. $\frac{3x}{4}$, C.P. of $\frac{1}{4}$th = Rs.$\frac{x}{4}$

Total S.P. = Rs. $\left[(120\% \text{ of } \frac{3x}{4}) + \frac{x}{4}\right]$ = Rs.$\left[\frac{9x}{10} + \frac{x}{4}\right]$ = Rs. $\frac{23x}{20}$

Gain = Rs.$\left[\frac{23x}{20} - x\right]$ = Rs. $\frac{3x}{20}$

So, gain% = $\left[\frac{3x}{20} \times \frac{1}{x} \times 100\right]\% = 15\%$

27. Option C

C.P. of 200 kg of mixture = Rs.$(80 \times 13.50 + 120 \times 16)$ = Rs.3000

S.P. = 116% of Rs.3000 = Rs.$\left[\frac{116}{100} \times 3000\right]$ = Rs.3480

So, rate of S.P. of the mixture = Rs.$\left[\frac{3480}{200}\right]$ per kg = Rs.17.40 per kg

28.   Option A

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

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

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

$$x = 10\%$$

29.   Option D

Let C.P. be Rs. x. Then,
(105% of x) - (80% of x) = 100 or 25% of x = 100

So,$\frac{x}{4} = 100$ or x = 400

So, C.P. = Rs.400

30.   Option B

10% of x = 15% of y , where x + y = 30000

$$\frac{x}{y} = \frac{3k}{2k}$$

Hence, the difference = k = 6000

31.   Option C

Profit   = Rs.(2602.58 - 2090.42) = Rs.512.16

Profit% $= \left[\frac{512.16}{2090.42} \times 100\right]\% = \left[\frac{512160}{209042} \times 10\right]\% = 24.5\% = 25\%$

32. Option B

$\frac{CP}{SP} = \frac{2}{3}$

So, profit% $=\frac{1}{2} \times 100 = 50\%$

33.   Option C

Let the MP of 1 kg tea be Rs.1, then CP of 20 kg with discount = 20×0.9 = Rs.18
Also 1 kg tea is free. So the retailer gets tea worth Rs.21 by paying Rs.18 only.

$$\text{Profit\%} = \frac{goods\ left}{goods\ sold} \times 100$$

$$= \frac{21 - 18}{18} \times 100 = 16.66\%$$

34. Option A

CP of A $= \frac{1818}{0.9} = 2020$

CP of B $= \frac{1818}{1.01} = 1800$

$\frac{CP\ of\ A}{CP\ of\ B} = \frac{2020}{1800} = \frac{101}{90}$

35. Option B

6.66% of MP = 25
MP = 375
SP = MP - 25 = 350

36. Option C

$\text{Profit\%} = \frac{25}{100} = \frac{120 + k}{880}$ $\qquad$ k = 100
Therefore, net profit% $= \frac{100}{1000} \times 100 = 10\%$

37. Option A

Charge of 1 call in February $= \frac{350}{150} = \frac{7}{3}$
Charge of 1 call in March $= \frac{350 + 50 \times 1.4}{250}$

$= \frac{420}{250} = \frac{42}{25}$

% cheapness of a call inn March $= \frac{\frac{7}{3} - \frac{42}{25}}{\frac{7}{3}} \times 100 = 28\%$

38. Option C

Let the number of diaries (produced) be 100 and the cost price of a diary be Rs.1
then, $\qquad$ total cost incurred $\qquad = 100 \times 1 = 100$
Total sale price $\qquad = 32 \times 0.75 + 60 \times 1.4 = 108$
Therefore, profit = Rs.8
Thus, there is 8% profit

39. Option C

$\text{Profit\%} = \frac{5}{95} \times 100 = 5.26\%$

40. Option C

$CP = Rs.80 \left[= \frac{3200}{40} \right]$

Now SP of 40 books = CP of 40 books + SP of 8 books
SP of 32 books = 3200
SP of 1 book = Rs.100
So, required SP of 1 dozen books = Rs.1200

41. Option C

CP = 100, SP (with tax) = 120
New SP = 100 - 5 = 95
So, effective discount = 120 - 95 = 25
So, at SP of 95 $\rightarrow$ discount = 25
And   at SP of 3325 $\rightarrow$ discount = $\frac{25}{95} \times 3325 = 875$

42. Option B

You must know that the company is able to deliver only 90% of the manufactured pens. So let k be the manufacturing price of a pen, then
Total income (including 25% profit) = (8000 × k) × 1.25
Also this same income is obtained by selling 90% manufactured pens at Rs.10 which is equal to 7200 × 10
Thus,   (8000 × k) 1.25 = 7200 × 10
K = Rs.7.2   (90% of 8000 = 7200)

43. Option C

Let the CP of one article be Rs.1
Then the SP be Rs.1.25
Again the new SP be (1.25) × 1.2 = 1.5
Now, if he sell initially 100 articles, then
CP = 100 × 1 = Rs.100
SP = 100 × 1.25 = Rs.125
New SP = 75 × 1.5 = 112.5 (since 25% articles were abducted)
So, new profit percentage = 12.5%

44. Option B

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

Gain %   = $\left[\frac{300}{5500} \times 100 \right] \% = 5\frac{5}{11}\%$

45. Option B

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

So, $\frac{5}{4}$ C.P. = 375

C.P. = Rs. $\left[375 \times \frac{4}{5}\right]$ = Rs.300

46.   Option A

Let C.P. of each mango be Rs.1
C.P. of 110 mangoes = Rs.110; S.P. of 110 mangoes = Rs.120

So, gain % = $\left[\frac{10}{110} \times 100\right]$% = $9\frac{1}{11}$%

47.   Option C

Suppose, number of fruits bought = L.C.M. of 16 and 8 = 16

C.P. of 16 fruits = Rs.24 S.P. of 16 fruits = Rs. $\left[\frac{18}{8} \times 16\right]$ = Rs.36

So, profit % = $\left[\frac{12}{24} \times 100\right]$% = 50%

48.   Option C

Suppose he bought 2 kg, 4 kg and 3 kg of the three varieties.
C.P. of 9 kg = Rs. $(2 \times 50 + 4 \times 20 + 3 \times 30)$ = Rs.270
S.P. of 9 kg = Rs. (9×33) = Rs.297

So, profit % = $\left[\frac{27}{270} \times 100\right]$% = 10%

49.   Option B

110% of 90% of 120% of A = 1188
$\frac{110}{100} \times \frac{90}{100} \times \frac{120}{100}$A = 1188
$\frac{1188}{1000}$A = 1188
A = 1000
So, A purchased it for Rs. (1000 - 110) Rs.890

50.   Option A

Let the C.P. be Rs. x
Then, S.P. = 120% of Rs. x = Rs. $\left[x \times \frac{120}{100}\right]$ = Rs. $\frac{6x}{5}$

So, $\frac{6x}{5}$ - x = 240
x = 1200
So, C.P. = Rs. $\left[\frac{6}{5} \times 1200\right]$ = Rs.1200
S.P. 1200 + 240 = 1440

51. Option C

Let C.P. of whole be Rs. x. C.P. of $\frac{2}{3}$rd = Rs. $\frac{2x}{3}$, C.P. of $\frac{1}{3}$rd = Rs. $\frac{x}{3}$

Total S.P. = Rs. $\left[(120\%\ of\ \frac{2x}{3}\right] + \left[114\%\ of\ \frac{x}{3})\ \right]$ = Rs. $\left[\frac{4x}{5} + \frac{19x}{50}\right]$ = Rs. $\frac{59x}{50}$

Gain = Rs. $\left[\frac{59x}{50} - x\right]$ = Rs. $\frac{9x}{50}$

So, Gain % = $\left[\frac{9x}{50} \times \frac{1}{x} \times 100\right]$ % = 18%

52. Option B

S.P. = $97\frac{1}{2}$% of Rs.650 = Rs. $\left[\frac{195}{2} \times \frac{1}{100} \times 650\right]$ = Rs. 633.75

53. Option B

Let marked price be Rs.100

Then, Final S.P. = 70% of 80% of Rs.100 = Rs. $\left[\frac{70}{100} \times \frac{80}{100} \times 100\right]$ = Rs.56

So, single discount = (100 - 56) = 44%

54. Option A

Let C.P. be Rs.100. Then, marked price = Rs.125

S.P. = 84% of Rs.125 = Rs. $\left[\frac{84}{100} \times 125\right]$ = Rs.105

So, profit % = (105 - 100) = 5%

55. Option D

Let the C.P. of each article be Rs.100

Then, C.P. of 16 articles = Rs. (100×16) = Rs.1600

S.P. of 15 articles = Rs. $\left[1600 \times \frac{135}{100}\right]$ = Rs.2160

S.P. of each article = Rs.$\frac{2160}{15}$ = Rs.144

If S.P. is Rs.96, marked price = Rs.100

If S.P. is Rs.144, marked price = Rs. $\left[\frac{100}{96} \times 144\right]$ = Rs.150

So, marked price = 50% above C.P.

56. Option A

Let the actual cost price of an article be Rs.1 (in place of x)

Now, he purchases goods worth Rs.120 and pays Rs.80, since 20% discount is allowed.

So, the CP = $\frac{80}{120} = \frac{2}{3}$

Again MP = 180, SP = 135 (since 25% discount)

Thus, the trader sells goods worth Rs.90 instead of 100 g and charges Rs.135.

Therefore the effective SP = $\frac{135}{90} = \frac{3}{2}$

So, profit % = $\frac{\frac{3}{2} - \frac{2}{3}}{2/3} \times 100 = 125\%$

57. Option C

$\left[((x \times 1.1) \times 1.1) \times \frac{1125}{1100} \right] = 990$

x = 800