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# QA - 03

**CEX-Q-0204/18****Number of Questions : 30**

### **Installments**

1. A man borrows Rs 6000 at 5% interest, on reducing balance, at the start of the year. If he repays Rs 1200 at the end of each year, find the amount of loan outstanding, in Rs. at the beginning of the third year. **(XAT 2012)**  
(1) 3162.75                      (2) 4125.00  
(3) 4155.00                      (4) 5100.00
2. A cellphone is available for Rs. 39000 cash or Rs. 6000 cash down payment followed by 4 equal monthly installments at 24% p.a. compound interest, compounded monthly. Find the value of each installment.  
(1) 12000                      (2) 15320  
(3) 9640                      (4) None

### **Profit, Loss and Discount**

3. Rehman buys a few apples at 15 for a rupee and the same number of apples at 20 for a rupee. He mixes the two lots and sells them at 35 for 2 rupees. What is his gain or loss percentage?  
(1) 3.62% loss  
(2) 2.04% profit  
(3) No profit, no loss  
(4) 2.04% loss

4. A trader marked the price of his goods 20% more than that of the cost price. He then sells  $\frac{1}{4}$  of his stock at a discount of 10%, and half of the stock at the marked price, and the rest at a discount of 25%. Find his gain percentage.  
(1) 18%                      (2) 9.5%  
(3) 12%                      (4) 2.25%
5. The aggregate cost of 2 apples, 3 mangoes and 4 oranges is Rs. 6 more than the aggregate cost 1 apple, 2 mangoes and 2 oranges, and the aggregate cost of 1 apple, 2 mangoes and 1 orange is Rs. 8 less than the aggregate cost of 3 apples, 3 mangoes and 5 oranges. If the aggregate list price of 3 apples, 1 mango and 6 oranges is Rs. 12, then find how much percent discount one should give on the sale of 3 apples, 1 mango and 6 oranges such that there is a net profit of 5%?  
(1) 10%                      (2) 7.5%  
(3) 15%                      (4) 12.5%
6. Mr Alphonso buys 2 lots of mangoes. The first lot costs him Rs. 30 per dozen and the second lot Rs. 50 per dozen. He sold all the mangoes at Rs. 40 per dozen. Find his profit or loss percentage if he spent the same amount of money on each of the lots.  
(1) 6.66% loss                      (2) 6.67% profit  
(3) 5% profit                      (4) 5% loss

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| <p>7. A retail bookseller buys books at 58% of the list price. He expects to earn a minimum of 20% net profit on his selling price. What is the maximum discount that he can offer to his customer?<br/>(1) 31.6%                      (2) 25.5%<br/>(3) 27.5%                      (4) 30%</p> <p>8. If a shopkeeper offers a discount of 20% on the list price of a washing machine, then he makes a profit of 12%. What is the percentage profit or loss, if he sells at a discount of 25% on the list price?<br/>(1) 0.6% loss                  (2) 0.5% profit<br/>(3) 4.25% loss                (4) 5% profit</p> <p>9. By selling 6 dozen oranges, a person incurs a loss which is equal to selling price of 1 dozen oranges. Find his loss percentage?<br/>(1) 14.28% loss              (2) 12.25% loss<br/>(3) 16.66% loss              (4) 14.66% loss</p> <p>10. A television set listed at Rs. 3,200 is sold to a retailer at successive discounts of 25% and 15%. What is the final amount paid by retailer of that television set?<br/>(1) Rs. 2,700                  (2) Rs. 2,040<br/>(3) Rs. 2,584                  (4) None of these</p> <p>11. Two horses were sold for Rs. 12,000 each, one at a loss of 20% and the other at a gain of 20%. The entire transaction resulted in<br/>(1) no loss no gain<br/>(2) loss of Rs. 1,000<br/>(3) gain of Rs. 1,000<br/>(4) None of these</p> <p>12. A man sells an article at a profit of 20%. If he had bought it at 20% less and sold it for Rs. 5 less, he would have gained 25%. Find the cost price (in Rs.) of the article.</p> | <p>13. If cost price of 4 articles is equal to selling price of 5 articles, then find the profit/loss percentage.<br/>(1) 20% loss                  (2) 25% profit<br/>(3) 25% loss                  (4) None of these</p> <p>14. The cost of manufacturing a commodity increased by 20%. A trader who did not revise the selling price noted that there was a drop of Rs.20 in his profit. What was the original cost price (in Rs.)?</p> <p>15. A man buys shares at a discount of Rs. x. Later he sold all but 10 of the shares he purchased at a premium of Rs. x. If his investment was Rs. 4,500 and proceeds from the sale were Rs. 6,250, then how many shares did he buy originally? [Assume the face value of shares as Rs. 100.]</p> <p>16. A shopkeeper marks an item for sale at Rs. 850 and then gives a discount of 20% on it. The item cost the shopkeeper Rs. 500 when he purchased the same from the wholesale. What is the profit (in percentage) earned by the shopkeeper?</p> <p>17. The Santabil shop offers that get a T-shirt free on the purchase of every three T-shirts. But they mark-up the price of the T-shirts by 60%. If a customer buys three T-shirts, then what is the profit or loss percentage for the store?</p> <p>18. Given that the cost price of 10 oranges is equal to the cost price of 1 kg of apples and the cost price of 12 apples is equal to the cost price of 1 kg of oranges. If the selling price of 15 oranges is equal to the selling price of 1 kg of apples, then the selling price of 1 kg of oranges is equal to selling price of (Assume that all the apples are identical and this holds true for the oranges as well.)<br/>(1) 8 apples                      (2) 9 apples<br/>(3) 10 apples                    (4) 12 apples</p> |
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19. On giving 3 pencils free with every 5 pens bought, a shopkeeper makes a profit of 20% and on giving 6 pencils free with every 2 pens bought, he suffers a loss of 25%. Find the approximate profit percent made by the shopkeeper when he gives 4 pencils free with every 6 pens bought. (Assume that the pencils are identical and the same applies to the pens.)  
 (1) 18% (2) 20%  
 (3) 24% (4) 16%
20. A merchant has 100 kg of sugar, a part of which he sells at 7% profit and the rest at 17% profit. He gains 10% on the whole. How much is sold at 17% profit?  
 (1) 70 kg (2) 50 kg  
 (3) 35 kg (4) 30 kg
21. A company had been selling its pianos at a discount of 20% on the marked price of Rs. 325. To increase its sales, it decided to allow an additional discount so that a piano could be sold for Rs. 234. What was the second discount allowed?  
 (1) 7% (2) 8%  
 (3) 9% (4) 10%
22. A merchant uses a weight of 0.85 Kg in place of 1 Kg to sell potatoes. Let his actual % profit or loss to be 'm' when he pretends to sell his articles at 5% loss and 'n' when he pretends to sell his articles at 5% gain. Find the value of (m + n).  
 (1)  $\frac{400}{17}$  (2)  $\frac{500}{17}$   
 (3)  $\frac{600}{17}$  (4)  $\frac{800}{17}$
23. I bought 5 pens, 7 pencils and 4 erasers. Rajan bought 6 pens, 8 erasers and 14 pencils for an amount which was 50% more than what I had paid. What percentage of the total amount spent by me was spent on the pens?  
 (1) 37.5% (2) 56.5%  
 (3) 50% (4) 62.5%
24. A machine produces articles at the rate of 50 units per hour. The articles are sold for Rs. 100 each and the cost of production is Rs. 40 each. However, 20% of the articles have some defect and thus cannot be sold. The production rate of machine can be increased, but every increase of x units per hour would increase the production cost by 2x% and the number of defectives would become  $(20 + 1.5x)\%$ .  
 What is the maximum increase in production that can be undertaken without incurring losses?  
 (1) 14 units (2) 15 units  
 (3) 16 units (4) 17 units
25. A shopkeeper sold two items at the same selling price. He made a loss on one item and made a profit on the other. The profit and loss percentage on the two items are 10 % and 20 %, not necessarily in that order. Find the net profit percentage for the shopkeeper given that he made a profit in the entire transaction.  
 (1) 3% (2) 3.16%  
 (3) 3.56% (4) 2.86%
26. A book was sold for a certain sum and there was a loss of 20%. Had it been sold for Rs. 3 more, then there would have been a profit of 30%. If it was sold for Rs. 6.60, then the profit/loss percentage would have been  
 (1) Profit 10% (2) Profit 8.33%  
 (3) Loss 8.33% (4) Loss 10%

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| <p>27. The different heads on which expenditure incurred in manufacturing a product, are material, man power and overheads cost. These costs are in the ratio 9 : 5 : 11 respectively. If the profit made on the product is 20% of the total cost, what is the ratio of the man power cost to profit?</p> <p>(1) 3 : 5                      (2) 1 : 1<br/>(3) 1 : 7                      (4) 7 : 11</p> | <p>29. A shopkeeper goes to the wholesale market to buy his merchandise. The wholesaler has a weighing balance that reads 1,100 g for a kilogram. The shopkeeper sells the entire purchase to a customer after marking up his by 10%. What is his net profit or loss percentage?</p> <p>(1) 20% profit              (2) 1.09% profit<br/>(3) 1.09% loss              (4) No profit, no loss</p> |
| <p><b>Faulty weights</b></p>  |   |
| <p>28. The spring balance of a trader weighed 800 g for 1 kg. What is the net result, if he claims to sell at cost price?</p> <p>(1) 25% loss              (2) 25% profit<br/>(3) 20% loss              (4) 20% profit</p>  | <p>30. A dishonest dealer claims to sell a product at its cost price. He uses a counterfeit weight which is 20% less than the real weight. Further greed overtakes him and he adds 20% impurities to the product. Find the net profit percentage of the dealer?</p> <p>(1) 44%                      (2) 40%<br/>(3) 50%                      (4) 56.25%</p>                                     |

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# QA - 03 : Percentage - 3

## Answers and Explanations

CEX-Q-0204/18

1	3	2	4	3	4	4	2	5	4	6	2	7	3	8	4	9	1	10	2
11	2	12	—	13	1	14	—	15	—	16	—	17	—	18	1	19	1	20	4
21	4	22	3	23	4	24	4	25	4	26	1	27	2	28	2	29	4	30	3

1. 3 Amount at the end of the 1st year after repayment  
 $= 6000 \times 1.05 - 1200 = \text{Rs. } 5,100$ .  
 Therefore, amount at the beginning of the 2nd year  
 will be Rs. 5,100.

Amount at the end of the 2nd year after repayment  
 $= 5,100 \times 1.05 - 1200 = \text{Rs. } 4,155$ .

Therefore, amount at the beginning of the 3rd year will  
 be Rs. 4,155.

### Alternate method:

Year	Amount at the beginning of the year	Interest	Repayment	Amount after repayment
1 <sup>st</sup>	Rs. 6,000	$\frac{600 \times 5 \times 1}{100} = \text{Rs. } 300$	Rs. 1,200	$6000 + 300 - 1200 = \text{Rs. } 5,100$
2 <sup>nd</sup>	Rs. 5,100	$\frac{5100 \times 5 \times 1}{100} = \text{Rs. } 255$	Rs. 1,200	$5100 + 255 - 1200 = \text{Rs. } 4,155$
3 <sup>rd</sup>	Rs. 4,155			

2. 4 Let the value of each instalment be x.

$$\therefore \frac{x}{1.02} + \frac{x}{(1.02)^2} + \frac{x}{(1.02)^3} + \frac{x}{(1.02)^4} = 33000$$

$$\Rightarrow x = 8666.6.$$

3. 4 Suppose Rehman buys (LCM of 15, 20 and 35)  
 = 420 apples.

Total cost of apples bought at 15 for a rupee

$$= \frac{420}{15} = \text{Rs. } 28$$

Total cost of apples bought at 20 for a rupee

$$= \frac{420}{20} = \text{Rs. } 21$$

$$\therefore \text{Total C.P} = \text{Rs. } (28 + 21) = \text{Rs. } 49$$

$$\text{S.P for } (420 + 420) \text{ 840 apples} = \text{Rs. } \frac{840 \times 2}{35} = \text{Rs. } 48$$

$$\therefore \text{Loss \%} = \frac{49 - 48}{49} \times 100 = 2.04\%.$$

4. 2 If CP = Rs. 100, MP = Rs. 120.

$$\text{Average SP} = \text{Rs. } \left( \frac{1}{4} \times 108 + \frac{1}{2} \times 120 + \frac{1}{4} \times 90 \right)$$

$$= \text{Rs. } (27 + 60 + 22.5) = 109.5$$

Hence, profit percentage

$$= \frac{109.5 - 100}{100} \times 100 = \text{Rs. } 9.5.$$

5. 4 Let the cost of 1 apple be 'a', cost of 1 mango be 'm' and the cost of 1 orange be 'o'

$$\text{Therefore, } (2a + 3m + 4o) - (a + 2m + 2o) = 6 \quad \dots(i)$$

$$\text{And } (3a + 3m + 5o) - (a + 2m + o) = 8 \quad \dots(ii)$$

$$2 \times (ii) - (i) : 3a + m + 6o = 10.$$

To make a profit of 5% one should sell 3 apples,  
 1 mango and 6 oranges at Rs.  $1.05 \times 10 = \text{Rs. } 10.5$ .

$$\text{Percent discount} = \frac{(12 - 10.5)}{12} \times 100 = 12.5\%.$$

6. 2 Suppose he invests Rs. 150 in each of the lots.

So total investment = Rs. 300.

He will get 5 dozens of first lot and 3 dozens of second lot. In all he will have 8 dozens, selling price of which will be  $40 \times 8 = \text{Rs. } 320$

$$\therefore \text{Profit percentage} = \frac{320 - 300}{300} \times 100 = \frac{20}{3} \approx 6.67\%.$$

7. 3 Let the list price of the book be Rs. 100. The booksellers cost price (CP) is Rs. 58. He earns 20% profit on his selling price (SP)

$$0.2 \text{ SP} = (\text{SP} - \text{CP})$$

$$\text{SP} = \frac{\text{CP}}{0.8} = \frac{58}{0.8} = 72.5$$

$$\text{Hence, maximum discount that can be offered} \\ = (100 - 72.5) = 27.5\%$$

8. 4 Let the cost price of the washing machine be Rs. 100 and list price be Rs. x.
- Then,  $x - x \times \frac{20}{100} = 112$
- $\Rightarrow 0.8x = 112 \Rightarrow x = \text{Rs. } 140$
- When the shopkeeper gives a discount of 25%, then selling price
- $= 140 - 140 \times \frac{25}{100} = 140 - 35 = \text{Rs. } 105$
- Hence, there will be a profit of 5%.
9. 1 Loss = CP – SP.  
1 dozen SP = 6 dozen CP – 6 dozen SP  
7 dozen SP = 6 dozen CP
- Loss% =  $\frac{1}{7} \times 100 \approx 14.28$ .
10. 2 SP of television =  $3200 \times (1 - 0.25) \times (1 - 0.15)$   
= Rs. 2040.
11. 2 Total selling price = Rs. 24,000 and in this type of transaction there is always loss.
- Therefore, loss percentage =  $\left(\frac{20}{100}\right)^2 = 4\%$
- Now, total cost price =  $\frac{24000 \times 100}{96} = \text{Rs. } 25,000$
- Loss =  $25000 - 24000 = \text{Rs. } 1,000$ .
12. Let the CP be Rs. x  
 $\therefore \text{SP} = \text{Rs. } 1.2x$   
New CP = Rs.  $0.8x$   
New SP = Rs.  $(1.2x - 5)$   
 $1.25(0.8x) = 1.2x - 5$   
 $x = 1.2x - 5$   
 $\therefore x = 25$ .
13. 1 Let CP of one article = Rs. 1  
CP of 5 articles = Rs. 5.  
SP of 5 articles = CP of 4 articles = Rs. 4.  
Hence SP < CP  
Loss =  $5 - 4 = 1$
- Loss % =  $\frac{1}{5} \times 100 = 20\%$ .
14. Suppose the initial cost price be Rs. x and the selling price be Rs. y. Initial profit = Rs.  $y - x$   
After the increase in manufacturing, cost price = Rs.  $1.2x$   
New profit = Rs.  $(y - 1.2x)$   
 $\therefore (y - x) - (y - 1.2x) = 20$   
 $\Rightarrow y - x - y + 1.2x = 20$   
 $\Rightarrow 0.2x = 20$   
 $\Rightarrow x = 100$ .
15. Let the man buy Rs. z shares.  
 $z(100 - x) = 4500$  and  $(z - 10)(100 + x) = 6250$ .  
Solving, we get  $z = 60$ .
16. The selling price of the item =  $850 \times 0.8 = \text{Rs. } 680.00$
- $\therefore$  Profit percentage =  $\frac{680 - 500}{500} \times 100 = \frac{180}{5} = 36\%$ .
17. Let the CP of each T-shirt be Rs. x  
CP of the (3 + 1) T-shirts to the shop =  $4x$   
SP of the 3 T-shirts =  $1.6 \times 3x = 4.8x$
- Profit percentage =  $\frac{0.8x}{4x} \times 100 = 20\%$ .
18. 1 Let the weight of 'p' apples be equal to 1 kg and the weight of 'q' oranges be equal to 1 kg.  
Let the cost price and selling price of 1 apple be ' $C_1$ ' and ' $S_1$ ' respectively.  
Let the cost price and selling price of 1 orange be ' $C_2$ ' and ' $S_2$ ' respectively.  
Therefore,  
 $10 \times C_2 = p \times C_1$  ....(i)  
 $q \times C_2 = 12 \times C_1$  ....(ii)  
 $15 \times S_2 = p \times S_1$  ....(iii)  
Let the selling price of 1 kg of oranges be equal to that of 'x' apples.  
Therefore,  $q \times S_2 = x \times S_1$  ....(iv)
- Dividing the equation (i) by (ii), we get that  $\frac{10}{q} = \frac{p}{12}$
- $\Rightarrow p \times q = 120$
- Dividing the equation (iii) by (iv), we get that  $\frac{15}{q} = \frac{p}{x}$
- Therefore,  $x = 8$ .
19. 1 Let 'x' and 'y' be the cost price of 1 pen and 1 pencil respectively.  
Let the selling price of 1 pen be 'z'.  
Cost price of 3 pencils and 5 pens =  $5x + 3y$   
Therefore,  $5z = 1.2(5x + 3y)$  or  $z = 0.24(5x + 3y)$ .  
Also,  $2z = 0.75(2x + 6y)$   
or,  $2(0.24(5x + 3y)) = 0.75(2x + 6y)$   
or,  $5x = 17y$ .  
Selling price of 6 pens =  $6z = 1.44(5x + 3y) = 1.44(20y) = 28.8y$   
Cost price of 6 pens and 4 pencils =  $6x + 4y = 24.4y$
- Profit percent =  $\left[ \frac{(28.8y - 24.4y)}{24.4y} \right] \times 100 = 18.03\%$ .
20. 4 Let x kg be the quantity sold at 17% profit, and the price of sugar be Rs. 1/kg  
 $\therefore 1.17x + (100 - x)1.07 = 110$   
 $\Rightarrow 0.10x = 3$   
 $\Rightarrow x = 30$ .

21. 4 Piano is sold for Rs.  $\left\{325 - 325 \times \frac{20}{100}\right\} = \text{Rs.} 260$  after giving 20% discount.  
After additional discount, it was sold for Rs. 234.
- So, second discount percentage =  $\frac{260 - 234}{260} \times 100$
- $$\frac{26}{260} \times 100 = 10\%$$
22. 3 Let the CP of 1000 g be Rs 100.  
 $\Rightarrow$  CP of 850 g = Rs.85  
SP of 850 gm when he sells at 5% loss  
 $= 100 - 5 = \text{Rs.} 95$
- Percentage profit (m) =  $(95 - 85) \times \frac{100}{85} = \frac{200}{17}$
- SP of 850 g when he sells at 5% gain  
 $= 100 + 5 = \text{Rs.} 105$
- Percentage profit, n =  $(105 - 85) \times \frac{100}{85} = \frac{400}{17}$
- $$\Rightarrow m + n = \frac{600}{17}$$
23. 4 Let us look at the two equations. Let (5 pens + 7 pencils + 4 erasers) cost Rs. x, and (6 pens + 14 pencils + 8 erasers) will cost Rs. 1.5x.  
In the second case, had Rajan decided to buy 10 pens instead of 6, it would have cost him Rs. 2x.  
 $\therefore$  (10 pens + 14 pencils + 8 erasers) = Rs. 2x.  
Now, subtracting the second equation from the third, we get 4 pens cost Rs. 0.5x.  
So 5 pens will cost Rs. 0.625 x.  
This is the amount that I have spent on pens.  
Hence, fraction of the total amount paid  
 $= 0.625 = 62.5\%$ .
24. 4 Revenue in 1 hr =  $100(50 + x) \frac{(100 - 20 - 1.5x)}{100}$
- $$\text{Cost} = 40(50 + x) \frac{(100 + 2x)}{100}$$
- Profit =  $2000 - 2.3x - 75x$ .  
If profit > 0,  $x < 17.38$   
 $\Rightarrow x = 17$ .
25. 4 He must have suffered only 10% loss in one item and earned 20% profit on the other item.  
Otherwise he cannot make an overall profit.

Let the S.P. of both the items be Rs. 100x each.

Item	SP	% Pr	CP
1	100x	-10	111.11x
2	100x	20	83.33x
Total	200x	-	194.44x

$\therefore$  Overall percentage profit

$$= \frac{(200 - 194.44)x}{194.44x} \times 100 = 2.86\%$$

26. 1 Let C.P. of the book be Rs. x  
Since loss = 20%  
S.P. = Rs. 0.8x  
If S.P. = Rs. (0.8x + 3), profit = 30%.

$$\text{Hence, } = \text{Rs.} \frac{100}{30} (0.8x + 3)$$

$$\Rightarrow x = \frac{100}{130} (0.8x + 3) \Rightarrow x = 6$$

$$\therefore \text{Required profit percentage} = \frac{6.60 - 6}{6} \times 100 = 10\%.$$

27. 2 Total cost =  $9x + 5x + 11x = 25x$   
 $20\% \text{ of total cost} = 20\% \text{ of } 25x = \frac{1}{5} \times 25x = 5x$   
Manpower cost : Profit =  $5x : 5x = 1 : 1$
28. 2 Trader's net profit =  $\frac{200}{800} \times 100 = 25\%$ .
29. 4 Let's say the shopkeeper buys at Re. 1 per gram.  
He buys 1000 gm, but pays for 1,100 g.  
He now mark-up his CP by 10%, hence he charges at the rate of Rs. 1.1 per gram.  
Hence, he makes a revenue of Rs. 1,100.  
So, he neither makes a profit nor a loss.
30. 3 Let the actual value be 100x.  
After he used the counterfeit weight, the value becomes 80% of the actual value or 80x.  
Also, after adding 20% impurities to the value now, it becomes 120% of 80x = 96x.  
And because of faulty balance it becomes  $1.25 \times 96x = 120x$   
So, the profit =  $\frac{120x - 80x}{80x} \times 100 = 50\%$ .