

Chapter 02

Profits

Contents for Discussion

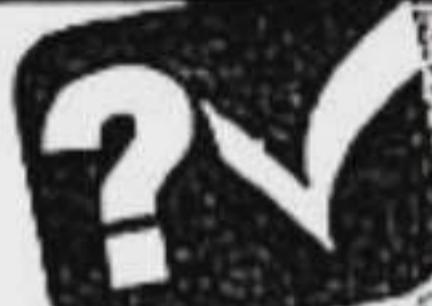
- Profit and loss • Profit • Problems related to profit • Determination of profit • Determination of principal • Determination of the rate of profit • Determination of time • Compound profit

 **Learning Outcomes :** After studying this chapter, I will be able to-

- Explain what profit is.
- Explain the rate of simple profit and solve the related problems.
- Explain the rate of compound profit and solve the related problems.
- Understand and explain the bank's statements.



Practice



Solutions to Mathematical Problems following
100% accurate format for best prep.

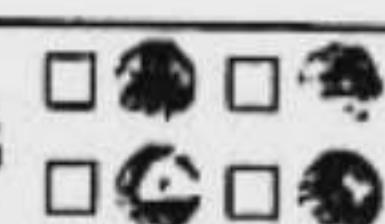
Dear learners, mathematical problems of this chapter have been divided into exercise, multiple choice, short, creative and exercise-based activities in light of the learning outcomes. Practice the solutions well to ensure the best preparation in the exam.

Exercise 2.1 : Profit and Loss

At a Glance Important Contents of Exercise

- **Profit :** If money is deposited in the bank, the bank earns profit from that money by lending it to various sectors like business, home construction etc. The amount of money the bank gives to the depositor from that profit is the profit or dividend received by the depositor. Profit is of two types. Namely: (1) Simple Profit and (2) Compound Profit.
- **Rate of profit :** If 100 taka is deposited according to the contract, after 1 year the amount of money that the bank will return to the depositor excluding the 100 taka, is the percentage of annual profit or profit rate, to one is published by
- **Period :** The period for which the profit is calculated is called the period. Duration can be months, years etc. It is usually expressed by n .
- **Cost Price :** The capital required to purchase a product is determined as the purchase price of that product. That is, the price at which goods are purchased is called cost price.
- **Selling Price :** The price at which a product is sold is called the selling price of that product. That is, the price at which the purchased product is sold is the selling price. That is, selling price plus purchase price.
- **Profit :** If the selling price of a product is more than the purchase price, profit is generated from the sale of that product. Again, if the sale price is greater than the purchase price (sale price minus purchase price), the profit is made. That is, $\text{profit} = \text{selling price} - \text{cost price}$.
- **Loss :** If the selling price of a product is less than its cost, there is a loss on sale of that product. Again, a loss occurs when the selling price exceeds the buying price ($\text{buying price} > \text{selling price}$). That is, $\text{loss} = \text{purchase price} - \text{sale price}$.
- **Value Added Tax or VAT :** The tax paid at a fixed rate along with the purchase price of a product is called Value Added Tax.


Solutions to Exercise Problems

Let's solve the textbook problems


Solutions to Mathematical Problems

1. On selling a commodity, the profit of a wholesale seller is 20% and the profit of retail seller is 20%. If the retail selling price of the commodity is Tk. 576, what is the cost price of the wholesaler?

Solution : The retailer makes 20% profit means, If selling price is Tk. 120, cost price of Tk. 100

$$\begin{aligned} \text{“ “ “ Tk. 1 “ “ Tk. } & \frac{100}{120} \\ \text{“ “ “ Tk. 576 “ “ Tk. } & \frac{100 \times 576}{120} \\ & = \text{Tk. 480} \end{aligned}$$

That is, the cost price of the retailer is Tk. 480 which is the selling price of the wholesaler. Again, the wholesaler makes 20% profit means, If selling price is Tk. 120, cost price is Tk. 100

$$\begin{aligned} \text{“ “ “ Tk. 1 “ “ Tk. } & \frac{100}{120} \\ & \quad \vdots \\ \text{“ “ “ Tk. 480 “ “ Tk. } & \frac{100 \times 480}{120} \\ & = \text{Tk. 400} \end{aligned}$$

∴ The cost price of the wholesaler is Tk. 400.

2. A shopkeeper sold some amount of pulses for Tk. 2,375 at the loss of Tk. 5%. What would be the selling price of pulses to make a profit of Tk. 6%?

Solution :

The shopkeeper suffered 5% loss means, If selling price is Tk. 95, cost price of Tk. 100

$$\begin{aligned} \text{“ “ “ Tk. 1 “ “ Tk. } & \frac{100}{95} \\ & \quad \vdots \\ \text{“ “ “ Tk. 2375 “ “ Tk. } & \frac{100 \times 2375}{95} \\ & = \text{Tk. 2500} \end{aligned}$$

Again, he could make 6% profit means, If cost price is Tk. 100, selling price is Tk. 106

$$\begin{aligned} \text{“ “ “ Tk. 1 “ “ Tk. } & \frac{106}{100} \\ & \quad \vdots \\ \text{“ “ “ Tk. 2500 “ “ Tk. } & \frac{106 \times 2500}{100} \\ & = \text{Tk. 2650.} \end{aligned}$$

∴ The selling price of pulses would be Tk. 2650.

3. An equal number of bananas is bought at 10 and 15 pieces per Tk. 30 and all the bananas are sold at 12 pieces per Tk. 30. What will be the percentage of profit or loss?

Solution :

$$\begin{aligned} \text{The cost price of 10 bananas is Tk. 30} \\ \therefore \text{ “ “ “ 1 “ “ Tk. } & \frac{30}{10} \\ & = \text{Tk. 3} \end{aligned}$$

Again, the cost price of 15 bananas is Tk. 30

$$\begin{aligned} \therefore \text{ “ “ “ 1 “ “ Tk. } & \frac{30}{15} \\ & = \text{Tk. 2} \end{aligned}$$

∴ The cost price of (1 + 1) or 2 bananas = Tk. (3 + 2) or, Tk. 5

Further, the selling price of 12 bananas is Tk. 30

$$\begin{aligned} \therefore \text{ “ “ “ 1 “ “ Tk. } & \frac{30 \times 2}{12} \\ \therefore \text{ “ “ “ 2 “ “ Tk. } & 2.5 \times 2 \\ & = \text{Tk. 5} \end{aligned}$$

So, we find that the selling price and the cost price of the same number of bananas is the same. Therefore, no profit or loss is made in the deal.

∴ There will be no profit or loss.

4. What will be the profit for Tk. 2,000 in 5 years if the percentage of profit is Tk. 10.50 per annum?

Solution : We know,

$$\begin{aligned} I &= Prn \\ &= 2000 \times \frac{10.50}{100} \times 5 \\ &= 2000 \times \frac{1050}{100 \times 100} \times 5 \\ &= 1050 \end{aligned}$$

Here,
yearly profit, r = 10.50%
 $= \frac{10.50}{100}$

Principal, P = Tk. 2000
Time, n = 5 years

$$= 1050$$

The profit will be Tk. 1050.

5. How much less will be the profit of Tk. 3,000 in 3 years if the percentage of profit per annum is decreased from Tk. 10 to Tk. 8?

Solution : Profit per annum decreased = Tk. (10 - 8) = Tk. 2

Profit of 100 of 1 year decreased Tk. 2

$$\begin{aligned} 1 \text{ “ “ “ } & \frac{2}{100} \\ 3000 \text{ “ “ “ } & \frac{2 \times 3000 \times 3}{100} \\ & = \text{Tk. 180} \end{aligned}$$

∴ Profit will be less by Tk. 180

6. What is the percentage of profit per annum by which Tk. 13,000 will be Tk. 18,850 as profit-principal in 5 years?

Solution :

We know, $I = Pnr$

$$\text{or, } r = \frac{I}{Pn}$$

$$= \frac{5850}{13000 \times 5}$$

$$= \frac{9}{100} = 9\%$$

\therefore Percentage of profit per annum 9%.

7. For what percentage of profit per annum, some principal will be double in profit-principal in 8 years?

Solution : Let, principal = Tk. 100

According to question, profit-principal after 8 years = Tk. (100×2) = Tk. 200

Profit in 8 years = Tk. $(200 - 100)$ = Tk. 100

Here, principal, $P = \text{Tk. } 100$;

profit, $I = \text{Tk. } 100$

time, $n = 8$ years; Rate of profit, $r = ?$

We know, $I = Pnr$

$$\text{or, } 100 = 100 \times 8 \times r$$

$$\text{or, } r = \frac{100}{100 \times 8} = \frac{100}{8} \times \frac{1}{100} = \frac{25}{2} \times \frac{1}{100} = 12\frac{1}{2}\% = 12.5\%$$

Rate of profit is 12.5%.

8. How much money will become Tk. 10,200 as profit-principal in 4 years at the same rate of profit at which Tk. 6,500 becomes Tk. 8,840 as the profit-principal in 4 years?

Solution : In first case, principal, $P = \text{Tk. } 6500$

Time, $n = 4$ years

Profit-principal, $A = \text{Tk. } 8840$

Profit, $I = A - P = \text{Tk. } (8840 - 6500) = \text{Tk. } 2340$

Rate of profit, $r = ?$

We know, $I = Pnr$

$$\text{or, } 2340 = 6500 \times 4 \times r$$

$$\text{or, } r = \frac{2340}{6500 \times 4} = \frac{2340}{26000} = \frac{9}{100} = 9\%$$

In second case, profit-principal, $A = \text{Tk. } 10200$
time, $n = 4$ years

$$\text{Rate of profit, } r = 9\% = \frac{9}{100}$$

and principal, $P = ?$

We know, $A = P + I = P + Pnr = P(1 + nr)$

$$\text{or, } 10200 = P \left(1 + 4 \times \frac{9}{100} \right)$$

$$\text{or, } 10200 = P \left(1 + \frac{9}{25} \right) = P \times \frac{25 + 9}{25}$$

$$\text{or, } 34 \times P = 10200 \times 25$$

$$\text{or, } P = \frac{10200 \times 25}{34} = \text{Tk. } 7500$$

Principal is Tk. 7500

9. Mr. Riaz deposited some money in a bank and got the profit of Tk. 4,760 after 4 years. If the percentage of profit of the bank is Tk. 8.50 per annum, what amount of money did he deposit in the bank?

Solution :

We know, $I = Pnr$

$$\text{or, } 4760 = P \times \frac{85}{1000} \times 4$$

$$P = \frac{4760 \times 1000}{85 \times 4}$$

$$= \frac{4760 \times 1000}{85 \times 4} = 14000$$

\therefore The principal is Tk. 14000.

Here,

Time, $n = 4$ years

Profit, $I = 4760$ taka

Rate of profit, $r = 8.5\%$

$$= \frac{85}{1000}$$

Principal, $P = ?$

10. What amount of money will become Tk. 2,050 as profit-principal in 4 years, at the same rate of profit at which some principal becomes double as profit-principal in 6 years?

Solution : In first case,

Let, principal $P = \text{Tk. } 100$; time $n = 6$ years

$$\therefore \text{Profit principal of 6 years, } A = \text{Tk. } (100 \times 2) = \text{Tk. } 200$$

\therefore Profit of 6 years, $I = \text{Tk. } (200 - 100) = \text{Tk. } 100$

We know, $I = Pnr$

$$\text{or, } 100 = 100 \times 6 \times r$$

$$\text{or, } r = \frac{100}{100 \times 6} = \frac{100}{6} \times \frac{1}{100} = \frac{50}{3}\%$$

In second case, rate of profit, $r = \frac{50}{3}\%$

$$= \frac{50}{3} \times \frac{1}{100} = \frac{1}{6}$$

time, $n = 4$ years

Profit-principal, $A = \text{Tk. } 2050$

Principal, $P = ?$

We know, $A = P + I = P + Pnr = P(1 + nr)$

$$\text{or, } 2050 = P \left(1 + 4 \times \frac{1}{6} \right) = P \left(1 + \frac{2}{3} \right)$$

$$\text{or, } 2050 = P \times \frac{3 + 2}{3}$$

$$\text{or, } P \times 5 = 2050 \times 3$$

$$\text{or, } P = \frac{2050 \times 3}{5} = \text{Tk. } 1230$$

The principal is Tk. 1230

15. Rodrick Gomage borrowed Tk. 10000 for 3 years and Tk. 15,000 for 4 years from a bank and paid Tk. 9,900 in total as a profit. In both cases if the rate of profit is same, find the rate of profit.

Solution : For 3 years, Here,
 Profit, $I = Pnr$ Principal, $P = \text{Tk. } 1000$
 $= 10000 \times 3 \times r$ Time, $n = 3$ years
 $= \text{Tk. } 30000$ Rate of profit = r (suppose)

Again, For 4 years, Here,
 Profit, $I = Pnr$ Principal, $P = \text{Tk. } 15000$
 $= 15000 \times 4 \times r$ Time, $n = 4$ years
 $= \text{Tk. } 60000r$ Rate of profit = r

\therefore Profit of 3 years + profit of 4 years = Total profit
 or, $30000r + 60000r = 9900$
 or, $90000r = 9900$

$$\text{or, } r = \frac{\frac{9900}{100}}{90000} = \frac{11}{100} = 11\%$$

\therefore Rate of profit 11%.

16. Some principal becomes its double as profit-principal in 6 years at the same percentage of profit. In how many years will it be thrice of it as profit-principal at the same percentage of profit?

Solution : Let, principal = Tk. 100

In 1st case,

profit-principal is 6 years Tk. $(100 \times 2) = \text{Tk. } 200$
 \therefore profit in 6 years = Tk. $(200 - 100) = \text{Tk. } 100$

In second case,

profit-principal Tk $(100 \times 3) = \text{Tk. } 300$

\therefore profit = Tk. $(300 - 100) = \text{Tk. } 200$

If profit is Tk. 100, time requires = 6 years

$$1 \quad " \quad " \quad " \quad \frac{6}{100} \quad "$$

$$200 \quad " \quad " \quad \frac{6 \times 200}{100} = 12 \text{ years}$$

\therefore Time is 12 years

17. The profit-principal for a certain period of time is Tk. 5,600 and the profit is $\frac{2}{5}$ of the principal. If the percentage of profit is Tk. 8, find the time.

Solution : Principal + profit = Profit-Principal

$$\text{or, Principal} + \frac{2}{5} \times \text{principal} = 5600$$

$$\text{or, } \left(1 + \frac{2}{5}\right) \times \text{principal} = 5600$$

$$\text{or, } \frac{7}{5} \times \text{principal} = 5600$$

$$\text{or, principal} = \text{Tk. } \frac{5600 \times 5}{7}$$

$$= \text{Tk. } 4000$$

$$\therefore \text{Profit} = \text{profit} - \text{principal} - \text{profit}$$

$$= \text{Tk. } (5600 - 4000)$$

$$= \text{Tk. } 1600$$

Again, we know,

$$I = Prn$$

$$\text{or, } n = \frac{I}{Pr}$$

$$\text{or, } n = \frac{1600}{4000 \times 0.08}$$

$$\text{or, } n = \frac{\frac{5}{200} \times \frac{1}{100}}{\frac{40}{4000} \times \frac{8}{1}} = 5 \text{ years}$$

The required time is 5 years

18. After having the pension, Mr. Jamil bought pension savings certificates of Tk. 10 lac for five years term on the basis of having the profit in three months' interval. If the percentage of profit is 12% per annum, what amount of profit will he get at the first installment, that is, after first three months?

Solution : Principal of Mr. Jamil is Tk. 10,00,000

$$\therefore \text{Principal, } P = \text{Tk. } 10,00,000$$

$$\text{Rate of profit, } r = 12\% = \frac{12}{100}$$

As he will get profit after 3 months

$$\text{So, time, } n = \frac{3}{12} \text{ years} = \frac{1}{4} \text{ years}$$

Profit, $I = ?$

$$\text{We know, } I = Pnr = \frac{10,00,000}{1} \times \frac{1}{4} \times \frac{12}{100}$$

$$= \text{Tk. } 30,000$$

\therefore He will get profit Tk. 30000 after 3 months.

Creative Questions with Solutions

Ques. 19 A fruit seller bought some bananas at the cost of Tk. 36 for 12 pieces from Jessore and Tk. 36 for 18 pieces from Kustia. He bought equal pieces of bananas both from Jessore and Kustia. His salesman sold the bananas at Tk. 36 for 15 pieces.

- What was the cost price of 100 pieces from Jessore? 2
- If the salesman sold all bananas, how much would be profit or loss? 4
- If the fruit seller wants to make 25% profit, what would be the selling price for 4 pcs of banana? 4

Solution to Question No. 19 :

a The buying price of 12 bananas = Tk. 36

$$\therefore \text{ " } " \text{ " } 1 \text{ " } = \frac{36}{12}$$

$$\therefore \text{ " } " \text{ " } 100 \text{ " } = \frac{36 \times 100}{12}$$

$$= \text{Tk. } 300$$

So, the cost price of 100 bananas from Jessore was 300 taka.

b Buying price of 12 bananas = Tk. 36 from Jessore

$$\therefore \text{ " } " \text{ " } 1 \text{ " } = \frac{36}{12} \text{ " }$$

$$= 3 \text{ " }$$

∴ Again, buying price of 18 bananas = Tk. 36 from Kushtia

$$\text{ " } " \text{ " } 1 \text{ " } = \frac{36}{18} \text{ " }$$

∴ Buying price of (1 + 1) or 2 bananas from Jessore and Kushtia = Tk. (3 + 2) or 5

Selling price of 15 bananas = Tk. 36

$$\text{ " } " \text{ " } 1 \text{ " } = \frac{36}{15}$$

$$\text{ " } " \text{ " } 2 \text{ " } = \frac{36 \times 2}{15} = \text{Tk. } \frac{24}{5}$$

So, it is evident from the above calculation that buying price of 2 bananas is more than selling price of the same number of bananas.

∴ The salesman made loss in the trade by = Tk. $\left(5 - \frac{24}{5} \right)$

$$= \text{Tk. } \frac{1}{5}$$

∴ In Tk. 5, loss is Tk. $\frac{1}{5}$

$$\therefore \text{ " } 1 \text{ " } = \text{Tk. } \frac{1}{5 \times 5}$$

$$\therefore \text{ " } 100 \text{ " } = \frac{100}{5 \times 5} = \text{Tk. } 4$$

∴ Loss was 4%.

c To make 25% profit, the fruit seller is required to buy bananas at Tk. 100 and then to sell the same at Tk. 125.

From (b) above, the buying price of 2 bananas = Tk. 5.

∴ To make 25% profit.

he should sell it at $\frac{5 \times 125}{100} = \text{Tk. } 6.25$

∴ 2 bananas to be sold at Tk. 6.25

$$4 \text{ " } " \text{ " } " 6.25 \times 2 = \text{Tk. } 12.50$$

So, the trader is to sell 4 banana at Tk. 12.50 for making 25% profit in the trade.

Ques. 20 A principal is turned to an amount in 3 years of Tk. 28,000 and in 5 years of Tk. 30,000 at simple interest.

- a. Using the symbols in details, write the formula for Principal. 2
- b. Find out the rate of interest or profit. 4
- c. How much principal should be deposited to get the amount of Tk. 48,000 at the same rate of interest in five years? 4

Solution to Question No. 20 :

a We know,

$$I = P r n$$

$$\text{or, } P = \frac{I}{r n}$$

Here, P = Principal

I = Profit principal

n = time

r = Profit.

This is the required formula.

b Profit principal in 5 years is Tk. 30,000
profit principal in 3 years is Tk. 28,000

$$\therefore \text{ profit in 2 years is Tk. } (30,000 - 28,000) \\ = \text{Tk. } 2,000$$

$$\therefore \text{ profit in 1 year is Tk. } \frac{2000}{2}$$

$$\therefore \text{ profit in 3 years is Tk. } \frac{2000 \times 3}{2} = \text{Tk. } 3000$$

$$\text{so, principal} = (28,000 - 3,000) \text{ taka} \\ = 25,000 \text{ taka}$$

$$\therefore \text{ Rate of profit per year} = \frac{\text{profit}}{\text{principal} \times \text{time}} \\ = \frac{3000}{25000 \times 3} = 4\%$$

$$c \quad \text{From 'b', Rate of profit, } r = 4\% = \frac{4}{100} = \frac{1}{25}$$

Let, principal = Tk. P

Profit-principal, A = Tk. 48000

∴ Profit, I = Tk. (48000 - P)

Time, n = 5 years

We know, I = Pnr

$$\text{or, } 48000 - P = Pnr$$

$$\text{or, } 48000 = Pnr + P$$

$$\text{or, } 48000 = P(nr + 1) = P \left(5 \times \frac{1}{25} + 1 \right) = P \left(\frac{1}{5} + 1 \right)$$

$$\text{or, } 48000 = P \times \frac{1+5}{5} = P \times \frac{6}{5}$$

$$\text{or, } P \times 6 = 48000 \times 5$$

$$\text{or, } P = \frac{48000 \times 5}{6}$$

$$\therefore P = \text{Tk. } 40000$$

∴ Deposited principal is Tk. 40000.

Multiple Choice Q/A



Designed as per topic



2.1 Profit and Loss

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11. $24\% = ?$ (Easy) [MB '19]

a @ $\frac{6}{25}$ b $\frac{4}{25}$ c $\frac{12}{25}$ d $\frac{3}{25}$

12. 7% of which amount will be Tk. 420? (Medium) [RB '18]

a Tk. 6294 b Tk. 6000
b Tk. 2960 d Tk. 1200

13. If bananas is bought 5 pieces per Tk. 1 and sold at 4 pieces per Tk. 1, what will be the percentage of profit or loss? (Medium) [CB '18]

a Profit 25% b Loss 25%
a Profit 20% d Loss 20%

14. If the ratio of cost price and selling is 3 : 4, what is the percentage of profit or loss? (Medium) [SB '18]

a Profit $33\frac{1}{3}\%$ b Loss $33\frac{1}{3}\%$
a Profit 25% d Loss 25%

15. Which one is correct for profit? (Easy) [BB '18]

a Selling price > Buying price
b Selling price < Buying price
c Buying price = Selling price + Profit
a Buying price = Selling price

16. 5 pieces are bought at Tk. 1 and 4 pieces are sold at Tk. 1. What will be the percentage of profit? (Hard) [DJB '18]

b 20% d 25% c 80% d 125%

17. If bananas is bought 3 pieces per Tk. 1 and the bananas are sold at 2 pieces per Tk. 1. What will be the percentage of profit or loss? (Hard) [DB '17]

a Profit $33\frac{1}{3}\%$ b Loss $33\frac{1}{3}\%$
c Profit 50% d Loss 50%

18. A shirt is sold Tk. 850 at the loss of 15%. Which one of the following is the cost price of the shirt? (Easy) [CB '17]

a Tk. 800 b Tk. 1000
b Tk. 1100 d Tk. 1250

19. If the ratio of cost price and selling price is 5 : 6, then what is the profit in percentage? (Medium) [CtgB '17]

b 10 d 20 c 25 d 30

20. The selling price of some mangoes of a mango seller is tk. 1600 and the profit is tk. 160. How much part is the profit of the cost price? (Medium) [CtgB '17]

d $\frac{9}{10}$ b $\frac{1}{10}$ c $\frac{10}{9}$ d $\frac{1}{9}$

21. If the selling price is Tk. 550 and cost price is Tk. 500 then profit is— (Medium) [SB '17]
b ① 12% ② 10% ③ 8% ④ 5%
22. Which one of the following is 150% of Tk. 50? (Easy) [DjB '17]
b ① 50 ② 75 ③ 100 ④ 150
23. Cost price of a thing is Tk. 500. At 8% rate of profit, what will be the selling price? (Medium) [DB '16]
c ① 108 ② 508 ③ 540 ④ 608
24. If 3 pieces are bought per taka and is sold at 2 pieces per taka. What will be the percentage of profit? (Easy) [JB '16]
c ① 20% ② 30% ③ 50% ④ 60%
25. The commodity is bought at 60 Tk. and is sold at 57 Tk. What will be the percentage of loss? (Easy) [JB '16]
b ① 4% ② 5% ③ 6% ④ 7%
26. If a pencil is sold at Tk 11, there is a profit 10%. What was the cost price of the pencil? (Easy) [CB '16]
b ① Tk 1 ② Tk 10 ③ Tk 12 ④ Tk 21
27. Cost price Tk. 1000, at the loss of 12% what will be the selling price? (Easy) [SB '16; JB '15]
b ① Tk. 988 ② Tk. 880 ③ Tk. 88 ④ Tk. 8.80
28. Which one of the following is 10% of Tk. 1050? (Easy) [SB '16]
a ① Tk. 10500 ② Tk. 1050
c ③ Tk. 105 ④ Tk. 10.50
29. 15% of Tk. 3000 = what? (Easy) [DjB '16]
a ① Tk. 450 ② Tk. 300 ③ Tk. 200 ④ Tk. 150
30. Selling price of some mangoes is Tk. 1600 and profit is Tk. 160. Profit is what part of principal? (Easy)
[Rajuk Uttara Model College, Dhaka]
d ① $\frac{9}{10}$ ② $\frac{1}{10}$ ③ $\frac{10}{9}$ ④ $\frac{1}{9}$
31. 12% of Tk 1120 = how much money? (Easy)
[Ideal School & College, Dhaka]
a ① Tk. 120 ② Tk. 11.20
c ③ Tk. 134.40 ④ Tk. 140.5
32. The cost price of 5 pieces of banana is at Tk. 1 and selling price of 4 pieces at Tk. 1. What will be the percentage of profit or loss? (Easy) [Ideal School & College, Dhaka]
a ① Profit 25% ② Loss 25%
a ③ Profit 20% ④ Loss 20%
33. What will be the percentage of loss or profit if 4 things are bought per taka : and sold 5 things per taka? (Easy)
[Viqarunnisa Noon School and College, Dhaka]
d ① Tk. 40 ② Tk. 10 ③ Tk. 30 ④ Tk. 20

34. Which is the 5% of Tk. 1200? (Easy)
[Viqarunnisa Noon School and College, Dhaka]
a ① Tk. 60 ② Tk. 6 ③ Tk. 50 ④ Tk. 5
35. Observe the information— [DB '16]
i. 4% of Tk. 25 is Tk. 1
ii. At 10% loss selling price is Tk. 90
iii. At 20% profit selling price is Tk. 110
Which one is correct? (Hard)
a ① i & ii ② i & iii ③ ii & iii ④ i, ii & iii
36. i. Selling price = cost price – loss when loss is made.
ii. The cost price is Tk. 100, selling price is Tk. 92. So, loss is 8%.
iii. Selling price is 120 against cost price of Tk. 100. So, profit is 20%.
Which one of the following is correct? (Hard)
d ① i ② i & ii ③ ii & iii ④ i, ii & iii
- Answer questions from 37 and 38 :
An orange seller bought 100 oranges for Tk. 1250 and sold it at Tk. 1500.
37. What was the cost price per four orange? (Easy)
b ① Tk. 45 ② Tk. 50 ③ Tk. 55 ④ Tk. 60
38. What is the profit per orange? (Easy)
a ① Tk. 3.00 ② Tk. 2.50
b ③ Tk. 3.25 ④ Tk. 2.75
- 2.2 Profit ► Textbook Page 14
39. Profit = ? (Easy) [DjB '17]
a ① Principal × rate of profit × time
b ② Principal × rate of profit
c ③ $\frac{\text{Principal} \times \text{time}}{\text{Rate of profit}}$
a ④ $\frac{\text{Principal} \times \text{rate of profit}}{\text{time}}$
40. What is the formula for compound principal? (Easy) [DB '16]
a ① $\frac{C}{P} = (1 - r)^n$ ② $\frac{C}{P} = (1 + r)^n$
b ③ $\frac{I}{P} = (1 - r)^n$ ④ I = pnr
41. If the principal is P and r is the percentage of profit per annum, then what will be the compound principal after 3 years? (Easy)
[Viqarunnisa Noon School and College, Dhaka]
a ① $P + (1 + r)^3$ ② $P + (1 + r)^2$
c ③ $P(1 + r)^3$ ④ $(1 + r)^3$
42. Rules of profit principal and loss-profit—. [JB '17]
i. profit = profit principal – principal
ii. profit = principal × time
iii. loss and profit depend on cost price
Which one of the following is correct? (Hard)
b ① i & ii ② i & iii ③ ii & iii ④ i, ii & iii

43. In case of interest —. [CB '16]
- $I = Prn$
 - $I = A - P$
 - $I = C - P$
- Which one is correct? (Hard)
- d) @ i & ii b) i & iii c) ii & iii d) i, ii & iii
44. In the field of profit related problem —. [CtgB '16]
- $A = P(1 + nr)$
 - $n = \frac{1}{Pr}$
 - $C = P(1 + r)^n$
- Which one is correct? (Hard)
- d) @ i & ii b) ii & iii c) i & iii d) i, ii & iii
45. Counting profit : [Ideal School & College, Dhaka]
- Profit = profit principal – Principal
 - Profit = $\frac{\text{Principal} \times \text{profit} \times \text{Principal}}{\text{Rate of profit}}$
 - Compound profit = compound principal-Principal
- Which one is correct? (Hard)
- b) @ i & ii b) i & iii c) ii & iii d) i, ii & iii
-  Problems related to profit ► Textbook Page 15
46. 12% of Tk. 25500 = what (Tk.)? (Easy) [CB '15]
- a) 306 b) 3006
 c) 3060 d) 3600
47. 20% of Tk. 2000 = what? (Easy) [Ctg.B' 15]
- a) Tk. 400 b) Tk. 80
 b) Tk. 100 d) Tk. 20
48. What is the percentage of profit per annum by which the profit of Tk 4000 will be Tk 2400 in 4 years? (Hard) [DB '19]
- a) $7\frac{1}{2}\%$ b) 15%
 b) 16% d) 20%
49. Some principal will be double in profit-principal in 5 years. What is the percentage of profit per annum? (Medium) [CB '19]
- c) 8% b) 10% c) 20% d) 30%
50. What is the profit of Tk 5,000 in 3 years at the rate of profit of 12% per annum? (Medium) [CB '19].
- a) Tk 2,000 b) Tk 1,800
 b) Tk 1,500 d) Tk 1,200
51. For which principal in 4 years Tk 480 will be the profit at the rate of profit 8%? (Easy) [CtgB '19].
- a) 1200 b) 1500
 b) 1600 d) 3200
52. In how many years will the profit of Tk 750 be Tk 225 at the rate of 7.50% profit? (Easy) [SB '19]
- a) 2 years b) 4 years
 b) 6 years d) 8 years
53. What is the simple profit of Tk 3,000 in 2 years at the rate of simple profit of 6% per annum? (Medium) [BB '19]
- a) Tk 36 b) Tk 90
 d) Tk 180 d) Tk 360
54. Which one of the following is 3% of Tk 350? (Easy) [BB '19]
- a) Tk 1.05 b) Tk 10.50
 b) Tk 35 d) Tk 105
55. What is the compound profit of Tk 8,000 at the profit of 12% per annum in 2 years? (Medium) [BB '19]
- a) Tk 1920 b) Tk 2035.20
 b) Tk 9920 d) Tk 10035.20
56. What is the simple profit of Tk 2,500 in 7 years at the rate of simple profit of 15%? (Medium) [MB '19]
- d) @ 105 b) 175 c) 375 d) 2625
57. In how many years will be profit of Tk. 200 be Tk. 96 at the rate of 12% profit? (Medium) [DB '18]
- b) @ 2 b) 4 c) 6 d) 8
58. On the profit of 10% per annum, for how much money will the profit be Tk. 1500 in 5 years? (Medium) [DB '18]
- a) Tk. 7500 b) Tk. 3000
 b) Tk. 750 d) Tk. 300
59. What is the rate of profit by which the profit of Tk. 4000 will be Tk. 1200 in 4 years? (Medium) [CtgB '18]
- d) 30% b) 13.33% c) 12% d) 7.5%
60. If some principal become double in 10 years, what is the rate of profit? (Easy) [SB '18]
- b) @ 5% b) 10% c) 20% d) 30%
61. What is simple profit of Tk. 1400 in 3 years at the rate of simple profit of 7% per annum? (Medium) [DB '17].
- a) Tk. 294 b) Tk. 420
 a) Tk. 2100 d) Tk. 4200
62. What is the years at principal Tk. 1200 and the simple profit Tk. 480 at the rate of simple profit 10% per annum? (Medium) [DB '17]
- b) @ 2 years b) 4 years c) 6 years d) 8 years
63. What is the simple profit of Tk. 700 in 4 years at the rate of profit of 10% per annum? (Medium) [RB '17]
- a) Tk. 350 b) Tk. 280
 b) Tk. 210 d) Tk. 150
64. In how many years the simple profit of Tk. 10,000 will be Tk. 4800 at a rate of 12%? (Medium) [RB '17]
- b) @ 2 years b) 4 years c) 6 years d) 8 years

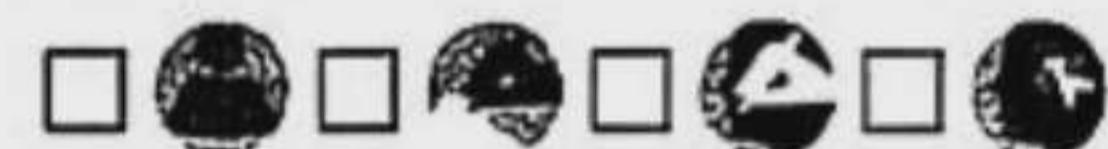


65. In how many years will the profit of Tk. 750 be Tk. 225 at the rate of 10%? Which one is correct? (Easy) [CB '17]
- a** @ 3 **b** 4 **c** 5 **d** 8
66. Which one of the following is the simple profit of Tk. 500 in one year at the rate of simple profit of Tk. 15% per annum? (Easy) [CB '17]
- c** @ Tk. 50 **b** Tk. 71 **c** Tk. 74 **d** Tk. 75
67. What is the profit in taka of Tk. 5000 at the rate of 10 taka per annum in 2 years? (Easy) [CtgB '17]
- d** @ 6050 **b** 6000 **c** 1050 **d** 1000
68. What is the profit of Tk. 750 in 4 years at 5% of profit? (Easy) [DB '16]
- b** @ 140 **b** 150 **c** 160 **d** 170
69. What is simple profit of Tk. 1500 in 3 years at the rate of simple profit of 10% per annum? (Easy) [RB '16]
- a** @ Tk. 1050 **b** Tk. 496.5
c @ Tk. 450 **d** Tk. 266.70
70. For what percentage of profit the principal will be three times in profit-principal in 10 years? (Hard) [CtgB '16]
- c** @ $\frac{1}{2}\%$ **b** 10% **c** 20% **d** 30%
71. If Tk. 5000 is deposited in a bank at the rate of simple profit 10%, what will be the profit-principal at the end of 2nd year? (Medium) [CtgB '16]
- c** @ 1000 **b** 1050 **c** 6000 **d** 6050
72. If the percentage of profit is Tk. 4 per annum, what will be the profit for Tk. 1250 in 3 years. (Easy) [SB '16]
- b** @ Tk. 105 **b** Tk. 150 **c** Tk. 300 **d** Tk. 510
73. $P = 3000$, $r = 6\%$ and $n = 5$, then— [RB '19]
- i. $I = 900$
ii. $C = 5900$
iii. $A = 3900$
- Which one is correct? (Hard)
- b** @ i & ii **b** i & iii **c** ii & iii **d** i, ii & iii
74. If p Tk become triple as profit-principal in 10 years, then— [CtgB '19]
- i. Profit-principal = Tk 3p
ii. Profit = Tk 2p
iii. rate of profit = 10%
- Which one is correct? (Hard)
- a** @ i & ii **b** i & iii **c** ii & iii **d** i, ii & iii
75. The simple rate of profit is 6% and principal is Tk 5,000— [SB '19]
- i. profit after 1 year is Tk 300
ii. after 3 years profit-principal is Tk 5,900
iii. in 5 years profit will be $\frac{3}{5}$ times of principal
- Which one is correct? (Hard)
- a** @ i & ii **b** i & iii **c** ii & iii **d** i, ii & iii

76. At 10% simple profit for principal Tk. 1500. (JB '18)
- i. profit in 1 year is Tk. 150
ii. in 10 years, the profit will be equal to the principal
iii. amount in 5 years is $2 \frac{1}{2}$ times of the principal
- Which one of the following is correct? (Hard)
- a** @ i & ii **b** i & iii **c** ii & iii **d** i, ii & iii
77. In the field of simple profit— [DB '17]
- i. $A = P + I$
ii. $P = Inr$
iii. $C = P(1 + r)^n$
- Which one is correct? (Hard)
- b** @ i & ii **b** i & iii **c** ii & iii **d** i, ii & iii
78. If Tk. P becomes double as profit-principal in 8 years then— [CB '17]
- i. profit-principal is Tk. 2P
ii. profit is Tk. P
iii. the rate of profit is 12.5% per annum
- Which one is correct? (Hard)
- d** @ i & ii **b** i & iii **c** ii & iii **d** i, ii & iii
79. $P = 500$, $r = 5\%$ and $n = 1$ then— [DjB '16]
- i. $I = 25$
ii. $A = 525$
iii. $C = 525$
- Which one is correct? (Easy)
- d** @ i & ii **b** i & iii **c** ii & iii **d** i, ii & iii
- According to the above information answer to the question nos. of 80 and 81 :
- Mizan takes a loan Tk 10,000 at the rate 8% and after 'x' years he paid Tk 12,400. [CB '19]
80. What is the interest? (Easy)
- a** @ Tk 2,400 **b** Tk 10,000
a @ Tk 10,400 **b** Tk 12,400
81. What is the value of 'x'? (Medium)
- a** @ 2 years **b** 3 years
b @ 5 years **b** 6 years
- Answer to the questions No. 82 and 83 based on the following information :
- The profit-principal of some amount for 5 years is Tk 15,000. The profit is $\frac{1}{4}$ part of the principal. [DjB '19]
82. What is the principal? (Easy)
- a** @ Tk 1,000 **b** Tk 1,200
d @ Tk 10,000 **b** Tk 12,000
83. What is the rate of profit? (Easy)
- a** @ 3% **b** 4%
c @ 5% **b** 6%

- Answer the questions No. 84 and 85 in the light of information given below :**
 Sunny investes Tk. 2000 at 5% profit. [DJB '18]
84. What will be profit-principal after two years? *(Easy)*
 (A) @ 1800 (B) 1900 (C) 2100 (D) 2200
85. In how many years the above principal will be doubled as profit principal? *(Medium)*
 (A) 4 years (B) 10 years
 (C) 20 years (D) 40 years
- Answer the questions No. 86 and 87 in the light of the following information :**
 A person deposited Tk. 2,000 in a bank at the rate of profit 8% for 3 years. [JB '17]
86. What is the simple profit? *(Easy)*
 (A) 160 taka (B) 480 taka
 (C) 840 taka (D) 1600 taka

87. In how many years the mentioned principal will be 2 times as profit principal? *(Hard)*
 (A) 6 years (B) $8\frac{1}{2}$ years
 (C) 10 years (D) $12\frac{1}{2}$ years
- Answer the questions No. 88 and 89 according to the following information :**
 Mr Mamun deposited Tk 3,000 in a bank at the rate of profit 5% per annum.
88. What will be the simple profit after 3 years? *(Easy)*
 (A) @ 150 (B) 300 (C) 450 (D) 540
89. In simple profit, what will be the profit principal after 2 years? *(Medium)*
 (A) @ 3,300 (B) 3,350 (C) 3,450 (D) 3,540

**Short Q/A****Designed as per topic****► 2.1 Profit and Loss**

► Textbook Page 12

Question 1. What does investment mean? What does profit or loss depend on?

Solution : A trader determines the actual cost by adding shop rent, transport and other additional costs with the cost price of the product. This actual cost is called investment.

Profit or loss depends on the cost price.

Question 2. If a banana seller buys 2 dozen bananas at the rate of Tk 75 per dozen and sells them at Tk 180, how much profit or loss will he make?

Solution : The cost price of 1 dozen bananas = Tk 75.
 \therefore The cost price of 2 dozen bananas = (75×2) Taka = Tk 150.

Here, selling price is higher than the cost price.

So, profit is made.

\therefore Profit = Selling Price - Cost Price = $(180 - 150)$ Taka = Tk 30

Required profit is Tk 30.

Question 3. A goat was sold at a loss of 10%. If it were sold at Tk 1000 more, there would be a profit of 10%. Find the cost price of the goat.

Solution : If the cost price is Tk 100, the selling price of the goat at 10% loss is Tk $(100 - 10)$ or Tk 90.
 Again, at 10% profit the selling price is Tk $(100 + 10)$ or 110 Tk

\therefore the selling price is more by Tk $(110 - 90)$ or Tk 20

If the selling price is more by Tk 20, then the cost price is Tk 100

If the selling price is more by Tk 1, then the cost price is Tk $100/20$

If the selling price is more by Tk 1000, then the cost price is Tk $\frac{100 \times 1000}{20}$ taka

$$= \text{Tk } 5000$$

Required cost price is Tk 5000.

Question 4. Selling a watch for Tk 856 makes a profit of 7%. What is the cost price of that watch?

Solution : If the cost price of the watch is Tk 100,
 Selling price at 7% profit = Tk $(100 + 7)$ = Tk 107

If the selling price is Tk 107, the cost price is Tk 100

If the selling price is Tk 1, then the cost price is Tk $\frac{100}{107}$

If the selling price is Tk 856, then the cost price is

$$\text{Tk } \frac{100 \times 856}{107} = \text{Tk } 800$$

Required cost price of the watch is Tk 800.

Question 5. If a product is bought for Tk 60 and sold for Tk 50, what percentage profit or loss will be?

Solution : Here, the cost price of the product is Tk 60
 And the selling price is Tk 50

Since the cost price is higher than the selling price,
 So, the loss is made.

$$\therefore \text{Loss} = \text{Cost Price} - \text{Selling Price}$$

$$\text{Tk } (60 - 50) \text{ or Tk } 10$$

Loss in Tk 60 is Tk 10



∴ Loss in Tk 1 is Tk $\frac{10}{60}$

$$\therefore \text{Loss in Tk } 100 \text{ is Tk } \frac{10 \times 100}{60} \\ = \frac{50}{3} = 16\frac{2}{3}\%$$

Required loss $16\frac{2}{3}\%$

Question 6. If the cost price of a product is Tk 115, what will be the selling price at 15% profit?

Solution : At 15% profit,

If the cost price is Tk 100, the selling price is Tk $(100 + 15) = \text{Tk } 115$

If the cost price is Tk 100, the selling price is Tk 115.

If the cost price is Tk 1, the selling price is Tk $\frac{115}{100}$

∴ If the cost price is Tk 115, the selling price is

$$\text{Tk } \frac{115 \times 115}{100} = \frac{529}{4} = 132.25$$

Required selling price Tk 132.25.

Question 7. A businessman buys 25 kg rice and sells 20 kg at the cost price. What percentage of profit will be?

Solution : Let, the cost price of 25 kg rice is Tk 100.

The selling price of 20 kg rice is Tk 100

The selling price of 1 kg rice is Tk $\frac{100}{20}$

∴ The selling price of 25 kg rice is Tk $\frac{100 \times 25}{20} = \text{Tk. } 125$

Since, the selling price of 25 kg rice is higher than the cost price. So, profit is made.

∴ Profit = Tk $(125 - 100)$ or Tk 25

The profit in Tk 100 is Tk 25.

Required profit is 25%.

Question 8. If an orange seller buys oranges at the rate of Tk 18 per quad and sells a score for Tk 100, how much profit will he make per quad?

Solution : We know, 1 quad = 4 and 1 score = 20

Selling price of 20 oranges is Tk 100

Selling price of 1 orange is Tk $\frac{100}{20}$

∴ Selling price of 4 oranges is Tk $\frac{100 \times 4}{20} = 20$

∴ Profit per quad = Tk $(20 - 18) = \text{Tk. } 2$.

∴ Profit per quad will be Tk 2.

Question 9. How much profit will be made if one buys 50 litchis for Tk 100 and sells 20 pieces for Tk 50?

Solution : Here, the selling price of 20 litchis is Tk 50.

The selling price of 1 litchi is Tk $\frac{50}{20}$

The selling price of 50 litchis is Tk $\frac{50 \times 50}{20} = 125$

$$\therefore \text{Profit} = \text{Selling Price} - \text{Cost Price} \\ = \text{Tk. } (125 - 100) = \text{Tk. } 25$$

Profit will be Tk 25.

► 2.2 and 2.3 Profit and Problems Related to Profit

► Textbook Page 14 & 15

Question 10. What is the profit of Tk 2500 for 7 years at 15% simple profit per annum?

Solution : We know, $I = Prn$ $= 2500 \times \frac{15}{100} \times 7$ $= \text{Tk. } 2625$	Here, Principal, P = 2500 Rate of profit, r = 15% = $\frac{15}{100}$ Time, n = 7 years Profit, I = ?
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Required Profit Tk. 2625.

Question 11. Mr. Rahman deposited Tk 6000 in the bank for 5 years at 10% profit per annum. What will be his profit-principal after 5 years?

Solution : We know, $A = P(1 + rn)$ $= 6000 \left(1 + \frac{10}{100} \times 5\right)$ $= 6000 \left(1 + \frac{1}{2}\right)$ $= 6000 \times \frac{3}{2}$ $= \text{Tk. } 9000$	Here, Principal, P = Tk. 6000 Rate of profit, r = 10% = $\frac{10}{100}$ Time, n = 5 years Profit-Principal, A = ?
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Required profit-principal is Tk 9000.

Question 12. If the rate of profit is $9\frac{1}{2}\%$ per annum, what amount will make profit Tk. 2850 in 6 years?

Solution : We know, $I = Prn$ $\text{or, } P = \frac{I}{rn}$ $= \frac{2850}{\frac{19}{2} \times 6}$ $= \frac{2850}{\frac{57}{100}}$ $= 2850 \times \frac{100}{57}$ $= \text{Tk. } 5000$	Here, Profit, I = Tk. 2850 Rate of profit, $r = 9\frac{1}{2}\% = \frac{19}{2}\%$ $\frac{19}{2}$ $= \frac{19}{100}$ $= \frac{19}{2 \times 100}$ Time, n = 6 years Principal, P = ?
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Required principal Tk 5000.

Question 13. What is the rate of profit per annum by which the profit of Tk 5000 will be Tk 2000 in 4 years?

Solution : We know,

$$I = Prn$$

$$\text{or, } r = \frac{I}{Pn}$$

$$\text{or, } r = \frac{2000}{5000 \times 4} \times 100\%$$

$$\therefore r = 10\%$$

Required rate of profit is 10%.

Question 14. In how many years will the profit of Tk 6000 be Tk 2700 at the rate of profit 9% per annum?

Solution :

$$\text{We know, } I = Prn$$

$$\text{or, } n = \frac{I}{Pr} = \frac{2700}{6000 \times \frac{9}{100}} = \frac{2700}{60 \times 9} = 5 \text{ years}$$

Required time 5 years

Question 15. The profit-principal of some principal is Tk 9900 in 3 years. If the profit is $\frac{4}{7}$ of the principal, find the principal?

Solution : We know, principal + profit = profit-principal

$$\text{or, principal} + \text{principal} \cdot \frac{4}{7} = 9900$$

$$\text{or, } \left(1 + \frac{4}{7}\right) \times \text{principal} = 9900$$

$$\text{or, } \frac{11}{7} \times \text{principal} = 9900$$

$$\text{or, Principal} = \frac{9900 \times 7}{11} = 6300$$

Required principal is Tk 6300.

Question 16. Write the formula of finding principal with description of symbols.

Solution : We know,

$$I = Prn$$

$$\text{or, } P = \frac{I}{rn}$$

Here,
Principal, $P = \text{Tk. } 5000$
Profit, $I = \text{Tk. } 2000$
Time, $n = 4 \text{ years}$
Rate of profit, $r = ?$

Question 17. For what percentage of profit per annum, some principal will be double in profit-principal in 5 years?

Solution : We know, Principal, $P = \text{Tk } 100$

$$\therefore \text{Profit-principal in 5 years, } A = \text{Tk } (100 \times 2) = \text{Tk } 200$$

$$\therefore \text{Profit, } I = A - P = \text{Tk } (200 - 100) = \text{Tk } 100$$

Time, $n = 5 \text{ years}$ and Rate of profit, $r = ?$

We know, $I = Prn$

$$\text{or, } r = \frac{I}{Pn} = \frac{100}{100 \times 5} \times 100\% = 20\%$$

Required rate of profit is 20%.

Question 18. For what percentage of profit per annum, Tk 15000 will be Tk 20850 in profit-principal in 6 years?

Solution : Here, Principal, $P = \text{Tk } 15000$

Profit-Principal, $A = \text{Tk } 20850$

$$\therefore \text{Profit, } I = A - P$$

$$= \text{Tk } (20850 - 15000)$$

$$= \text{Tk } 5850$$

Time, $n = 6 \text{ year}$

We know, $I = Prn$

$$\text{or, } r = \frac{I}{Pn} = \frac{5850}{15000 \times 6} \times 100\% = \frac{13}{2}\% = 6.5\%$$

Required rate of profit is 6.5%.

Question 19. What is the profit of Tk 8000 in 2 years and 6 months at a profit of $12\frac{1}{2}\%$ per annum?

Solution : We know,

$$I = Prn$$

$$= 8000 \times 0.125 \times 2.5$$

$$= \text{Tk } 2500$$

Here,

Principal, $P = \text{Tk } 8000$

Rate of profit, $r = 12\frac{1}{2}\%$

$$= 12.5\% = \frac{12.5}{100} = 0.125$$

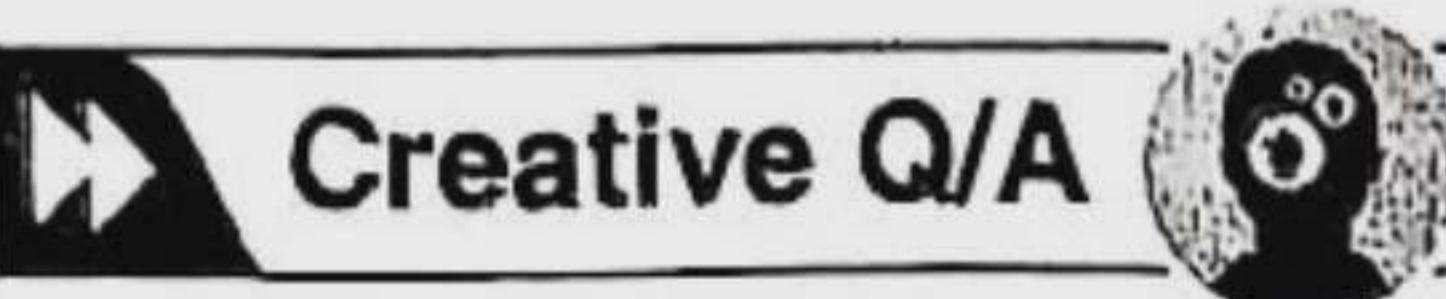
Time, $n = 2 \text{ year } 6 \text{ month} = 2.5 \text{ year}$

Profit, $I = ?$

Required profit is Tk 2500.

This is the formula of finding principal.





Designed as per learning outcomes

Ques. 01 The profit-principal of some principal is Tk. 11000 in 6 years. The profit is $\frac{3}{8}$ part of the principal.

- Determine the principal and the rate of profit. (Easy) 2
- Determine the principal and the rate of profit. (Medium) 4
- If the principal and the profit-principal are the buying and selling price of a goat respectively, determine the rate of profit. (Hard) 4

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∴ Profit = (11000 – 8000) taka = 3000 taka

Now, at 8000 taka, profit is 3000 taka

$$\begin{aligned} " & \quad 1 \quad " \quad " \quad " \quad \frac{3000}{8000} " \\ " & \quad 100 \quad " \quad " \quad " \quad \frac{3000 \times 100}{8000} " \\ & \qquad \qquad \qquad = \frac{75}{2} \text{ taka} \\ & \qquad \qquad \qquad = 37 \frac{1}{2} \text{ taka} \end{aligned}$$

∴ The required profit is $37 \frac{1}{2}\%$

Answer to Question No. 01 :

- a Simple profit, $I_s = Pnr$,
where P = Principal,
 n = Time, r = Rate of profit per annum.
Compound principal, $C = P(1+r)^n$, where P = Principal, n = Time, r = Rate of profit percent per annum
- b We know, Principal + profit = profit-principal
or, principal + $\frac{3}{8}$ principal = 11000
or, $\left(1 + \frac{3}{8}\right) \times \text{principal} = 11000$
or, $\left(\frac{8+3}{8}\right) \times \text{principal} = 11000$
or, $\frac{11}{8} \times \text{principal} = 11000$
or, $\text{principal} = \frac{11000 \times 8}{11} = \text{Tk. } 8000$
∴ Profit = Profit-principal – principal
= Tk. (11000 – 8000)
= Tk. 3000

Here, Principal, P = Tk. 8000
profit, I = Tk. 3000
time, n = 6 years

$$\begin{aligned} \text{Rate of profit, } r &= \frac{I}{Pn} = \frac{3000}{8000 \times 6} = \frac{1}{16} \\ &= \frac{1 \times 100}{16} \times \frac{1}{100} = \frac{25}{4} \times \frac{1}{100} = \frac{25}{4}\% = 6\frac{1}{4}\% \end{aligned}$$

The required principal is 800 taka and rate of profit $6\frac{1}{4}\%$.

- c According to the given information, profit-principal = 11000 taka, selling price, and principal = 8000 taka, or buying price.

Ques. 02 On selling a watch, the profit of producer is 25%, the profit of wholesaler is 20% and the profit of retailer is 15%. The retail price of the watch is Tk 690.

- Determine the profit of Tk 690 in 5 years at the rate of 20% profit. (Easy) 2
- What is the cost price of the watch of the wholesaler? (Medium) 4
- What is the increase in percentage of price of the watch for the general people? (Hard) 4

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Answer to Question No. 02 :

- a Here, principal, P = 690 taka

$$\text{Rate of profit, } r = 20\% = \frac{20}{100}$$

time, $n = 5$ years

we know, simple profit, $I = Ptn$

$$\therefore I = 690 \times \frac{20}{100} \times 5 \text{ taka} = 690 \text{ taka}$$

The required simple profit is 690 taka

- b 15% profit means, If cost price is 100 taka then selling price is $(100 + 15)$ taka or 115 taka.
Now, for retailer,

If selling price is 115 taka then cost price is 100 taka

$$\begin{aligned} \therefore " & \quad 1 \quad " \quad " \quad " \quad \frac{100}{115} " \\ \therefore " & \quad 690 \quad " \quad " \quad " \quad \frac{100 \times 690}{115} \\ & \qquad \qquad \qquad = 600 \text{ taka} \end{aligned}$$

Here, cost price of retailer = selling price of wholesaler
At 20% profit means, if cost price is 100 taka then selling price is $(100 + 20)$ or 120 taka



Now, for wholesaler,

If selling price is 120 taka then cost price is 100 taka

$$\therefore \text{ " } 1 \text{ " } " \quad \frac{100}{120} \text{ "}$$

$$\therefore \text{ " } 600 \text{ " } " \quad \frac{100 \times 600}{120} \text{ "}$$

$$= 500 \text{ taka}$$

\therefore Therefore cost price of wholesaler is 500 taka. (Ans.)

c) From 'b' we get,

Wholesaler cost price = 500 taka

Here, selling price of producer = cost price of wholesaler

At 25% profit means, if production cost is 100 taka then selling price is $(100 + 25)$ or 125 taka

Now, for producer,

If selling price is 125 taka then production cost is 100 Taka

$$\therefore \text{ " } 1 \text{ " } " \quad \frac{100}{125} \text{ "}$$

$$\therefore \text{ " } 500 \text{ " } " \quad \frac{100 \times 500}{125} \text{ "}$$

$$= 400 \text{ taka}$$

\therefore The increase of price = $(690 - 400)$ Taka
= 290 Taka

\therefore The increase of price in percentage = $\frac{290}{400} \times 100\%$
 $= \frac{145}{2}\% = 72\frac{1}{2}\%$ (Ans.)

Ques. 03 Profit principal of 5 years is 16800 taka and profit principal of 3 years is 15200 taka.

- a. What is the simple profit of 6500 taka at 10.50% profit for 6 months? (Easy) 2
- b. Find principal and profit. (Medium) 4
- c. When profit principal will be double of principal at $12\frac{1}{2}\%$ profit. (Hard) 4

Answer to Question No. 03 :

a) We know,

$$I = Prn$$

$$I = 6500 \times \frac{10.50}{100} \times 2.5$$

$$\therefore I = 1706.25 \text{ Taka}$$

Here,
Principal, P = 6500 taka
Rate of profit,
 $r = 10.50\% = \frac{10.50}{100}$

Time, n = 2 years 6 months = 2.5 year

Profit, I = ?

\therefore The required profit 1706.25 taka

b) Principal + profit of 5 years = 16800 taka
Principal + profit of 3 years = 15200 taka

(-) subtracting, profit of 2 years = 1600 taka

$$\therefore \text{profit of 1 years} = \frac{1600}{2} \text{ taka}$$

$$\therefore \text{profit of 3 years} = \frac{1600 \times 3}{2} \text{ taka}$$

$$= 2400 \text{ taka}$$

Here, Principal + profit of 3 years = 15200 taka
profit of 3 years = 2400 taka

$$\therefore \text{Principal} = 12800 \text{ taka}$$

The principal is 12800 taka

c) We know, $I = Prn$

$$n = \frac{I}{Pr}$$

$$n = \frac{12800}{12800 \times \frac{12.5}{100}}$$

$$n = \frac{1}{\frac{12.5}{100}}$$

$$n = I \times \frac{100}{12.5}$$

From 'b' Principal, P = 12800 taka

Profit-Principal,

$$A = 12800 \times 2 \text{ taka}$$

$$= 25600 \text{ taka}$$

\therefore Profit, I = A - P

$$= (25600 - 12800) \text{ taka}$$

$$= 12800$$

$$\text{Profit, } r = 12\frac{1}{2}\%$$

$$= \frac{25}{2}\% = \frac{12.5}{100}$$

$$\therefore n = 8 \text{ years}$$

The required time is 8 years.



Solutions to Textual Activities



Along with textual reference

Activity 01 Fill in the blank spaces : ▶ Textbook Page 614

Cost price (Tk.)	Selling price (Tk.)	Profit/Loss	Percentage of Profit/Loss
600	660	Profit Tk. 60	Profit 10%
600	552	Loss Tk. 48	Loss 8%
	583	Profit Tk. 33	
856		Loss Tk. 107	
		Profit Tk. 64	Profit 8%

Solution :

Cost price (Tk.)	Selling price (Tk.)	Profit/Loss	Percentage of Profit/Loss
600	660	Profit Tk. 60	Profit 10%
600	552	Loss Tk. 48	Loss 8%
550	583	Profit Tk. 33	Profit 6%
856	749	Loss Tk. 107	Loss 12.5%
800	864	Profit Tk. 64	Profit 8%

Exercise 2.2 : Compound Profit

At a Glance Important Contents of Exercise

- Compound Profit :** The final profit obtained by adding the profit to the capital at the end of each period and calculating the new capital is called compound profit.
- Formulation of compound capital and profit formula :** Let, principal = P and annual rate of profit = r, then compound principal at the end of 1 years,
 $C = \text{principal} + \text{profit}$
 $= P + Pr$
 $= P(1 + r)$

Compound principal at the end of 2nd year,

$$\begin{aligned} C &= \text{principal} + \text{profit} \\ &= P(1 + r) + P(1 + r)r \\ &= P(1 + r)(1 + r) \\ &= P(1 + r)^2 \end{aligned}$$

Compound principal at the end of 3rd year,

$$\begin{aligned} C &= \text{principal} + \text{profit} \\ &= P(1 + r)^2 + P(1 + r)^2r \\ &= P(1 + r)^2(1 + r) \\ &= P(1 + r)^3 \end{aligned}$$

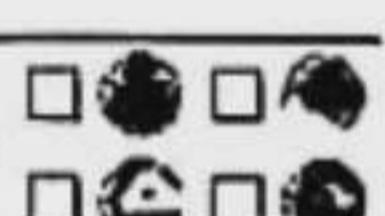
∴ Similarly, compound principal at the end of n years.

$$C = P(1 + r)^n$$

$$\begin{aligned} \text{Compound profit} &= \text{Compound Principal} - \text{initial principal} \\ &= P(1 + r)^n - P \end{aligned}$$

Solutions to Exercise Problems

Let's solve the textbook problems



MCQs with Answers

1. Which one of the following is 8% of Tk. 1050?

c @ Tk. 80 ⑤ Tk. 82 ⑥ Tk. 84 ⑦ Tk. 86

► Explanation :

$$8\% \text{ of Tk. } 1050 = \text{Tk. } 1050 \times \frac{8}{100} = \text{Tk. } 84.$$

2. What is the simple profit of Tk. 1200 in 4 years at the rate of simple profit of 10% per annum?

d @ Tk. 120 ⑤ Tk. 240 ⑥ Tk. 360 ⑦ Tk. 480

► Explanation : Given,

Principal, P = Tk. 1200

Profit per annum, r = 10% and Time, n = 4 years

Simple profit, I = pnr

$$\begin{aligned} &= \frac{1200 \times 4 \times 10}{100} \text{ taka} \\ &= 480 \text{ taka} \end{aligned}$$

3. The cost price of something is 5 pieces at Tk. 1 and selling price is 4 pieces at Tk. 1. What will be the percentage of profit or loss?

a Profit 25% ⑤ Loss 25%

c Profit 20% ⑦ Loss 20%

► Explanation :

$$\text{Cost price of 1 pen} = \text{Tk. } \frac{1}{5}$$

Selling price of 1 pen = Tk. $\frac{1}{4}$

$$\begin{aligned} \text{Profit} &= \text{Tk. } \left(\frac{1}{4} - \frac{1}{5} \right) \\ &= \text{Tk. } \left(\frac{5-4}{20} \right) \\ &= \text{Tk. } \frac{1}{20} \end{aligned}$$

If cost price is Tk. $\frac{1}{5}$, profit = Tk. $\frac{1}{20}$

$$\text{Profit} = \text{Tk. } \left(\frac{1}{20} \div \frac{1}{5} \right)$$

$$\begin{aligned} &= \text{Tk. } \left(\frac{1}{20} \times 5 \times 100 \right) \\ &= 25\% \end{aligned}$$

∴ Percentage of profit is 25%.

4. Counting profit :

i. Profit = profit – principal – principal

$$\text{ii. Profit} = \frac{\text{Principal} \times \text{Profit} \times \text{Principal}}{2}$$

iii. Compound Profit = Compound principal – principal

According to the above information, which one of the following is correct?

b ① i & ii ⑤ i & iii ⑥ ii & iii ⑦ i, ii & iii

5. At 10% simple profit for principal Tk. 2000.

 - Profit in 1 year is Tk. 200
 - Amount in 5 years is $1\frac{1}{2}$ times of principal
 - In 6 years the profit will be equal to principal

Which one of the following is correct?

a ① i & ii ② i & iii ③ ii & iii ④ i, ii & iii

6. Mr Jamil deposited Tk. 2,000 in a bank at the rate of profit 10% per annum :

 - What will be the profit-principal at the end of the 1st year?
 ① Tk. 2,050 ② Tk. 2,100
 ③ Tk. 1,200 ④ Tk. 2,250
 *[N.B. : The correct is Tk. 2,200.]
► Explanation : We know,

$$A = P(1 + nr)$$

$$= 2000 \left(1 + 1 \times \frac{10}{100}\right) = 2200$$

$$\therefore \text{Profit-principal after 1 years is Tk. 2200.}$$
 - In simple profit, what will be the profit-principal at the end of 2nd year?
 ① Tk. 2,400 ② Tk. 2,420
 ③ Tk. 2,440 ④ Tk. 2,450
► Explanation : We know,

$$A = P(1 + nr)$$

$$= 2000 \left(1 + 2 \times \frac{10}{100}\right)$$

$$= 2000 \left(1 + \frac{1}{5}\right)$$

$$= 2400$$

$$\therefore \text{Profit-principal at the end of 2nd years is Tk. 2400.}$$
 - What will be the compound principal at the end of 1st year?
 ① Tk. 2,050 ② Tk. 2,100
 ③ Tk. 21,500 ④ Tk. 2,200
► Explanation : We know,

$$C = P(1 + r)^n$$
 $C = [\text{Compound principal}]$

$$= 2000 \left(1 + \frac{1}{10}\right)^1$$

$$= 2000 \times \frac{11}{10}$$

$$= 2200$$

$$\therefore \text{Compound principal is Tk. 2200.}$$

Solutions to Mathematical Problems □

$$\begin{aligned}
 C &= 8000 \left(1 + \frac{10}{100}\right)^3 = 8000 \left(1 + \frac{1}{10}\right)^3 \\
 &= 8000 \left(\frac{11}{10}\right)^3 = 8000 \times \frac{11 \times 11 \times 11}{10 \times 10 \times 10} \\
 &= 8 \times 11 \times 121 = 88 \times 121 = 10648
 \end{aligned}$$

8. What will be the difference of simple profit and compound profit of Tk. 5,000 in 3 years if the rate of profit is Tk. 10 percent per annum?

Solution : Given, rate of profit, $r = 10\% = \frac{10}{100} = \frac{1}{10}$
 time, $n = 3$ years
 Principal, $P = 5000$ taka

$$\begin{aligned}
 \text{Simple profit, } I &= Pm = 5000 \times \frac{1}{10} \times 3 = 1500 \text{ taka} \\
 \therefore \text{Compound principal, } C &= P(1 + r)^n \\
 &= 5000 \left(1 + \frac{1}{10}\right)^3 \text{ taka} \\
 &= 5000 \left(\frac{10 + 1}{10}\right)^3 \text{ taka} = 5000 \times \left(\frac{11}{10}\right)^3 \text{ taka} \\
 &= 5000 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} \\
 &= 6655 \text{ taka}
 \end{aligned}$$

\therefore Compound profit = C – P
 $= (6655 - 5000) = 1655$ taka
 \therefore Difference between compound and simple
 interest = $(1655 - 1500)$ taka

\therefore Difference between compound and simple interest 155 taka.

9. What was the principal if the compound principal of any amount of principal at the end of one year is Tk. 6,500 and at the end of two years is Tk. 6,760 at the same rate of profit?

Solution :

Let, the rate of interest = $r\%$ per annum and
Principal = P

∴ Compound principal at the end of 1 year = Tk. $P(1 + r)$
 and, " " " " " 2nd " = Tk. $P(1 + r)^2$

Now as per condition, we have

$$P(1+r)^2 = 6760 \quad \dots \dots \dots (2)$$

$$\therefore \frac{p(1+r)^2}{p(1+r)} = \frac{6760}{6500}, \quad [\text{dividing (2) by (1)}]$$

or, $1 + r = 1.04$

or, $r = 1.04 - 1$

or, $r = .04$

$$\text{or, } r = \frac{4}{100}$$

Now putting the value of r in (i) we have,

$$P \left(1 + \frac{4}{100}\right) = 6500$$

$$\text{or, } P\left(\frac{104}{100}\right) = 6500$$

$$\text{or, } 104P = 6500 \times 100$$

$$\text{or, } P = \frac{6500 \times 100}{104}$$

$$\text{or, } P = 6250$$

∴ Principal is Tk. 6250

10. If the rate of compound profit is Tk. 8.50 percent per annum, find the compound principal and compound profit of Tk. 10,000 in 2 years.

Solution : Here, Principal $P = 10000$ taka,

$$\text{Rate of profit, } r = 8.50\% = \frac{8.50}{100}$$

time, $n = 2$ year

$$\text{Compound principal, } C = P(1 + r)^n,$$

$$\therefore C = 10000 \left(1 + \frac{8.50}{100}\right)^2 \text{ taka}$$

$$= 10000 \left(\frac{100 + 8.50}{100}\right)^2 = 10000 \left(\frac{108.50}{100}\right)^2 \text{ taka}$$

$$= \frac{10000 \times 108.50 \times 108.50}{100 \times 100} \text{ taka}$$

$$= 108.50 \times 108.50 \text{ taka} = 11772.25 \text{ taka}$$

∴ Compound principal = 11772.25 taka

and compound profit = $C - P$

$$= (11772.25 - 10000) \text{ taka}$$

$$= 1772.25 \text{ taka}$$

∴ Compound principal is Tk. 11772.25 and compound profit is Tk. 1772.25.

11. Present population of a city is 64 lac. What will be the population of the city after 2 years if growth rate of population of the city is 25 per thousand?

Solution :

Here, present population, $P = 6400000$

$$\text{Rate of increase, } r = \frac{25}{1000} = \frac{2.5}{100}$$

Time, $n = 2$ years

Total population after 2 years,

$$C = P(1 + r)^n$$

$$= 6400000 \times \left(1 + \frac{2.5}{100}\right)^2$$

$$= 6400000 \times \left(\frac{102.5}{100}\right)^2$$

$$= 6400000 \times \frac{102.5}{100} \times \frac{102.5}{100}$$

$$= 6724000$$

∴ Population of the city after 2 years will be 67,24,000

12. A person borrows Tk. 5,000 from a lending organization at the rate of 8% compound profit. At the end of every year he paid off Tk. 2,000. How much more money will he have as loan after paying off the 2nd installment?

Solution :

Here, for 1st year, principal, $P = \text{Tk. } 5000$

$$\text{Rate of interest, } r = 8\% = \frac{8}{100}$$

Time: $n = 1$ year

∴ The compound principal at the end of 1 year

$$C = P(1 + r)$$

$$= \text{Tk. } 5000 \left(1 + \frac{8}{100}\right)$$

$$= \text{Tk. } 5000 \times \frac{108}{100}$$

$$= \text{Tk. } \frac{540000}{100} = \text{Tk. } 5400$$

So, after making payment of Tk. 2000 at the end of 1 year, the principal will become $(5400 - 2000)$ taka or Tk. 3400

Again, for the 2nd year, $P = \text{Tk. } 3400$

$$r = 8\% = \frac{8}{100}$$

$n = 1$ year

$$\therefore C = P(1 + r)$$

$$= \text{Tk. } 3400 \left(1 + \frac{8}{100}\right)$$

$$= \text{Tk. } 3400 \left(\frac{108}{100}\right)$$

$$= \text{Tk. } 3672$$

So, after making payment of Tk. 2000 as 2nd installment at the end of the 2nd year, the principal will remain Tk. $(3672 - 2000)$ or 1672

Creative Questions with Solutions

Ques. 13 At the same rate of compound profit a principal will amount to Tk. 19,500 after 1 year and Tk. 20,280 after 2 years.

a. Write down the formula for profit.

b. Find out the principal.

c. Find the difference between simple profit and compound profit after 3 years at the same rate for the principal.

Solution to Question No. 13 :

a. Simple Profit, $I = Pnr$

and Compound Profit = $P(1 + r)^n - P$

Here, P = Principal; r = rate of profit and n = Time

b. Let,

Compound principal after 1 years, $C = \text{Tk. } 10500$

" " " " 2 " " $C = \text{Tk. } 20280$

Given $P(1 + r)^n$,

$$19500 = P(1 + r)^1 \quad (\text{Time, } n = 1 \text{ year})$$

$$\text{or, } P(1 + r)^1 = 19500 \dots\dots\dots (1)$$

$$\text{Again, } 20280 = P(1 + r)^2 \quad (\text{Time, } n = 2 \text{ year})$$

$$\text{or, } P(1 + r)^2 = 20280 \dots\dots\dots (2)$$

Dividing (2) by (1),

$$1 + r = \frac{20280}{19500}$$

$$\text{or, } 19500 + 19500r = 20280$$

or, $19500 r = 20280 - 19500$

or, $r = \frac{780}{19500} = \frac{1}{25}$

Putting value of r in eqn (i), $P \left(1 + \frac{1}{25}\right) = 19500$

or, $P \left(\frac{26}{25}\right) = 19500$

or, $P = \frac{19500 \times 25}{26} = 18750$

∴ Principal is Tk. 18750.

c From 'b', Principal, $P = 18750$ taka and Rate of profit, $r = \frac{1}{25}$

Here, Time, $n = 3$ year

$$\text{Compound principal, } C = P (1 + r)^3 = 18750 \left(1 + \frac{1}{25}\right)^3 \text{ taka}$$

$$= 18750 \times \left(\frac{26}{25}\right)^3 \text{ taka} = 21091.2 \text{ taka}$$

$$\therefore \text{Compound profit} = C - P$$

$$= (21091.2 - 18750) \text{ taka}$$

$$= 2341.2 \text{ taka}$$

$$\text{Simple profit, } I = Prn = \left(18750 \times \frac{1}{25} \times 3\right) \text{ taka}$$

$$= 2250 \text{ taka}$$

$$\therefore \text{Difference between compound and simple profit} = (2341.2 - 2250) \text{ taka}$$

$$= 91.2 \text{ taka (approx)}$$

Ques. 14 Shipra Barua deposited Tk. 3,000 in a bank and got Tk. 3,600 together with the profit after 2 years.

- a. Find the percentage of simple profit.
- b. What will be the profit-principal after another 3 years?
- c. What would be the compound principal after 2 years if Tk. 3,000 was deposited at the same percentage of compound profit?

Solution to Question No. 14 :

a Here, Principal, $P = 3000$ taka, Time, $n = 2$ year Profit-Principal, $A = 3600$ taka

$$\therefore \text{Profit, } I = A - P = (3600 - 3000) \text{ taka or, } 600 \text{ taka}$$

We know, $I = Pnr$

or, $r = \frac{I}{Pn}$

$$\therefore \text{gybvdvi nvi} = \frac{600}{3000 \times 2} = \frac{1}{10} \times 100 = 10\%.$$

∴ The rate of profit is 10%.

b Here, Principal, $P = 3000$ taka

Time, $n = (2 + 3)$ year or, 5 year

$$\text{Rate of profit, } r = 10\% \text{ or, } \frac{10}{100} \text{ or, } \frac{1}{10}$$

∴ Profit-Principal = $P(1 + nr)$

$$= 3000 \left(1 + 5 \times \frac{1}{10}\right) \text{ taka}$$

$$= 3000 \left(1 + \frac{1}{2}\right)$$

$$= 3000 \left(\frac{2+1}{2}\right) \text{ taka}$$

$$= \frac{1500}{3000} \times \frac{3}{2}$$

$$= 4500 \text{ taka.}$$

The required profit principal is Tk. 4500.

c Here, Principal, $P = 3000$ taka and Time, $n = 2$ year

From 'a', Rate of profit, $r = 10\% = \frac{10}{100}$

We know, Compound principal, $C = P (1 + r)^n$

$$\therefore C = 3000 \times \left(1 + \frac{10}{100}\right)^2 \text{ taka}$$

$$= 3000 \times \left(\frac{100+10}{100}\right)^2 \text{ taka}$$

$$= 3000 \times \left(\frac{110}{100}\right)^2 \text{ taka}$$

$$= 3000 \times \left(\frac{11}{10}\right)^2 \text{ taka}$$

$$= 3000 \times \frac{121}{100} \text{ taka} = 3630 \text{ taka}$$

∴ Compound principal after 2 years would be Tk. 3630.



► Multiple Choice Q/A



Designed as per topic



2.4 Compound profit

→ Textbook Page 20

1. Present population of a district is 50 lac. The growth rate is 20 per thousands. What will be the population after 3 years of that district? (Medium) [DjB '19]

Ⓐ 51,00,000 Ⓑ 53,06,040

Ⓑ 55,20,434 Ⓒ 60,00,000

2. What will be the difference of simple profit and compound profit of Tk. 500 in 1 year if the rate of profit is 10% per annum? (Hard) [JB '18]

Ⓐ Tk. 0 Ⓑ Tk. 50

Ⓐ Tk. 500 Ⓒ Tk. 550

3. What is the compound profit of Tk. 3,000 at the profit of 8.5% per annum in 3 years? (Medium) [CigB '18]

Ⓐ Tk. 3831.86 Ⓑ Tk. 3765

Ⓒ Tk. 831.86 Ⓒ Tk. 765

4. What is compound profit of Tk. 500 in 3 years at 20% profit? (Easy) [SB '18]

Ⓐ Tk. 300 Ⓑ Tk. 364 Ⓒ Tk. 800 Ⓓ Tk. 864

5. What is the compound principal of Tk. 8000 in 2 years at 10% profit? (Medium) [SB '18]

Ⓐ Tk. 1600 Ⓑ Tk. 1680

Ⓒ Tk. 9600 Ⓓ Tk. 9680

6. The formula of compound principal determination is— (Easy) [BB '18]
 @ $C = P(1+r)^n$ ⑥ $C = P(1+n)^r$
 ② ④ $C = P(1+r)^n - P$ ⑦ $C = P + A$
7. What is the formulae for compound principal? (Easy) [RB '17]
- ① ③ $I = pnr$ ⑤ $I = (1-r)^n$
 ② ④ $P = C(1+r)^n$ ⑥ $C = P(1+r)^n$
8. What is the compound principal of Tk. 3,000 in 2 years at the rate of profit 5%. (Easy) [JB '17]
 ① Tk. 3307.50 ⑤ Tk. 4500.00
 ② Tk. 6750.00 ④ Tk. 11025.00
9. What is the compound principal (in taka) of Tk. 2000 at the profit of 10% per annum in 2 years? (Easy) [BB '17]
 ① ③ 242 ⑤ 420 ② 2400 ④ 2420
10. What will be the compound principal of Tk 2,000 after 2 years at 15% rate of interest? (Easy) [CB '16]
 ① Tk 220 ⑤ Tk 242
 ② Tk 2,200 ④ Tk 2,420
 * [N.B. : C.A. : Tk 2645]
11. If the rate of profit is 12%, which is the compound principal of Tk. 30000 in 2 years? (Easy) [SB '16]
 ① Tk. 37632 ⑤ Tk. 37332
 ② Tk. 37300 ④ Tk. 35632
12. What will be the difference between simple profit and compound profit of Tk. 500 in 1 year if the rate of profit is 10% per annum? (Medium)
 [Rajuk Uttara Model College, Dhaka]
 ① ③ Tk. 0 ⑤ Tk. 50 ② ④ Tk. 500 ⑥ Tk. 550
13. What is the compound principal of Tk. 62500 in 3 years at the profit of Tk. 8 percent per annum? (Medium)
 [Ideal School & College, Dhaka]
 ① Tk. 68732 ⑤ Tk. 69732
 ② Tk. 78732 ④ Tk. 80732
14. What is the compound principal of Tk. 10,000 in 2 years at the rate of 5% per annum? (Easy)
 [I'lqarunnisa Noon School and College, Dhaka]
 ① Tk. 11,520 ⑤ Tk. 11025
 ② Tk. 1102.50 ④ Tk. 11250
15. The formula of finding simple profit or compound principal is— [DB '19]
 i. $I = pnr$
 ii. $A = p(1-nr)$
 iii. $C = p(1+r)^n$
 Which one is correct? (Medium)
 ① ③ i & ii ⑤ ii & iii ② ④ i & iii ⑥ i, ii & iii
16. The rate of profit is 10% and principal is Tk. 5,000. (Hard) [RB '18]
 i. profit Tk. 1000 of 2 years is Tk. 200
 ii. profit of 8 years is equal to principal
 iii. compound principal of 5 years is Tk. 8052.55
 Which one of the following is correct?
 ① ③ i & ii ⑤ i & iii ② ④ ii & iii ⑥ i, ii & iii

17. Rate of profit is 4% per annum of Tk. 5000 in 3 years— (Hard) [CtgB '18]
 i. profit is Tk. 600
 ii. profit-principal is Tk. 5600
 iii. compound principal is Tk. 5670
 Which one of the following is correct?
 ① ③ i & ii ⑤ i & iii ② ii & iii ④ i, ii & iii
18. If $p = 2000$, $r = 9\%$ and $n = 5$. (Hard) [SB '18]
 i. $I = 180$
 ii. $A = 2900$
 iii. $C = 3077.25$ (Approx)
 Which one of the following is correct?
 ① ③ i & ii ⑤ i & iii ② ii & iii ④ i, ii & iii
19. In the case of compound profit— [DjB '17]
 i. Principal = $P(1+7)^n$
 ii. Profit = $P(1+r)^n - p$
 iii. Profit = $C - P$.
 Which one is correct? (Hard)
 ① ③ i & ii ⑤ i & iii ② ii & iii ④ i, ii & iii
- Answer to the questions No. 20 and 21 by using the following information :
 Present population of a town is 10 lac. The growth rate of population of the town is 30 per thousand. [JB '19]
20. How many population of the town will increase in one year? (Easy)
 ① 3,000 ⑤ 30,000
 ② ④ 10,03,000 ⑥ 10,30,000
21. What will be the population of the town after 3 years? (Medium)
 ① ③ 10,90,000 ⑤ 10,92,772
 ② ④ 10,92,720 ⑥ 10,92,727
- Answer the question Nos. 22 and 23 according to the following information :
 Tk. 8,000 is deposited in a bank at the rate of 4% profit. [RB '18]
22. What will be the profit-principal after 3 years? (Medium)
 ① Tk. 8900 ⑤ Tk. 8999
 ② ④ Tk. 8960 ⑥ Tk. 9960
23. What will be the compound profit after 2 years? (Hard)
 ① Tk. 8652.80 ⑤ Tk. 8640.00
 ② ④ Tk. 652.80 ⑥ Tk. 640.00
- Answer to the questions number 24 and 25 by using the following information :
 A person deposited Tk. 3000 in a bank at the rate of 9% profit for 3 years. [CB '18]
24. Which is the simple profit? (Easy)
 ① Tk. 270.00 ⑤ Tk. 564.30
 ② ④ Tk. 810.00 ⑥ Tk. 885.09
25. What will be the compound principal of the amount in 3 years? (Medium)
 ① Tk. 3270.00 ⑤ Tk. 3564.30
 ② ④ Tk. 3810.00 ⑥ Tk. 3885.09

- Answer the questions No. 26 and 27 with the help of the given information :
Mr. Karim deposited Tk. 2,000 in a bank in 2 years at a rate of 10% profit. [SB '17]

26. Which is the simple profit? (Easy)
Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

27. Which is the difference of compound profit and simple profit? (Medium)
Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

■ Answer to the questions no. 28 and 29 in the light of the following information :
At the same rate of profit, the amount of Tk. 1000 becomes doubles in 6 years and becomes tripled as profit principal in n years. [BB '17]

28. What is the rate of profit? (Easy)
Ⓑ Ⓑ Ⓒ Ⓓ Ⓔ

29. What is the value of n? (Easy)
Ⓒ Ⓑ Ⓒ Ⓓ Ⓔ

■ Answer to the question numbers 30 and 31 by using the following information :
Present population of a city is 15 lac. The growth rate of population of the city is 20 per thousand. [RB '16]

30. What is growth rate of population of the city? (Easy)
Ⓒ Ⓑ Ⓒ Ⓓ Ⓔ

31. What will be the population of the city after 3 years? (Medium)
Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

■ Present population of a city is 30 lac. The growth rate of population of that city is 30 per thousand.

Answer the questions No. 32 and 33 in respect of the above information : [JB '16]

32. What is the growth rate of population? (Easy)
Ⓐ 30% Ⓑ 5% Ⓒ 3% Ⓓ 2%

Short Q/A



Designed as per topic



2.4 Compound Profit

► Textbook Page 20

Question 1. Write two formulas for determining compound principal and compound profit with explanation of symbols.

Solution : Compound principal,
 $C = P(1 + r)^n$

$$\text{Compound profit} = C - P$$

$$= P(1 + r)^n - P$$

Where,
 P = Principal
 r = Rate of profit
 n = Time

Question 2. Find the compound principal of Tk. 5000 for 3 years at a profit of 10 per cent per annum.

Solution : We know,

Compound principal,

$$C = P(1 + r)^n$$

$$\text{or, } C = 5000 \left(1 + \frac{10}{100}\right)^3 \text{ taka} = \frac{10}{100}$$

$$= 5000 (1 + 0.1)^3 \text{ taka} \quad | \text{Time, } n = 3 \text{ year}$$

...and time, ... your

- 33.** What will be the population of the city after 3 years? (Medium)

Ⓐ 30,70,750 Ⓑ 31,75,750
Ⓑ 32,70,550 Ⓒ 32,78,181

d According to the following information answer to the questions No. 34 and 35 : The simple profit in n years of Tk. 1500 is Tk. 900 at the rate of 12% per annum. [SB '16]

34. What is the value of n? (Easy)

Ⓐ 20 years Ⓑ 14 years
Ⓒ 7 years Ⓒ 5 years

35. If $n=2$, then what will be the compound profit? (Medium)

Ⓐ Tk. 13.00 Ⓑ Tk. 180.00
Ⓒ Tk. 381.60 Ⓒ Tk. 660.00

■ Answer to the questions No. 36 and 37 in the light of the following information : Rony deposited Tk. 10000 at 5% interest for 2 years in the bank. [DJB '16]

36. What will be the simple interest after 2 years? (Easy)

Ⓐ Tk. 2000 Ⓑ Tk. 1500
Ⓒ Tk. 1000 Ⓒ Tk. 500

37. What will be the compound capital after 2nd year? (Medium)

Ⓐ Tk. 11000 Ⓑ Tk. 11025
Ⓒ Tk. 11052 Ⓒ Tk. 11125

■ Using the following information answer the question No. 38 and 39 : There are 256 fishes in a pond and 50% fishes is increased in each year.

[Rajuk Uttara Model College, Dhaka]

38. How many is 50% of 256 fishes? (Easy)

Ⓐ 126 Ⓑ 128 Ⓒ 120 Ⓓ 2569

39. How many years will be required to make the number of fishes to be 6561? (Medium)

Ⓐ $\frac{3}{2}$ Ⓑ $\frac{2}{3}$ Ⓒ $\frac{1}{4}$ Ⓓ 8 years

$= 5000 (1.1)^3 = (5000 \times 1.331) = 6655$ taka
Required compound principal Tk. 6655.

Question 3. Find the compounded profit of Tk 10000 in 5 years at 9%.

Solution : Here, Initial principal, $P = 1000$ taka

$$\text{Rate of profit, } r = 9\% = \frac{9}{100}$$

Time, n = 5 years

We know,

$$\begin{aligned}
 \text{Initial principal, } &= C - P \\
 &= P(1 + r)^n - P \\
 &= 10000 \left(1 + \frac{9}{100}\right)^5 - 10000 \\
 &= 10000 (1.09)^5 - 10000 \\
 &= (15386.2395 - 10000) \text{ taka} \\
 &= 5386.24 \text{ taka (Approx)}
 \end{aligned}$$

Required compound profit Tk. 5386.24 (approx.).

Question 4. Present population of a district is 50 lacs. What will be the population of the district after 3 years if the growth rate of population of that area is 20 per thousand?

Solution : Here, population, $P = 5000000$

$$\text{Rate of population growth, } r = \frac{20}{1000} = 0.02$$

$$n = 3 \text{ year}$$

We know, compound principal formula applies to population growth.

$$\therefore C = P(1 + r)^n$$

$$\begin{aligned} \text{or, } C &= 5000000 (1 + 0.02)^3 \\ &= 5000000 (1.02)^3 \\ &= 5306040 \end{aligned}$$

Required population is 5306040.

Question 5. Present population of an upazila is 200000. What will be the population of the district after 2 years if the growth rate of population of that area is 25 per thousand?

Solution : Here, population, $P = 200000$ Rb

$$\text{Rate of population growth, } r = \frac{25}{1000} = 0.025$$

$$\text{Time, } n = 2 \text{ year}$$

We know,

$C = P(1 + r)^n$ [∴ Compound principal formula applies to population growth.]

$$\begin{aligned} \text{or, } C &= 200000 (1 + 0.025)^2 \\ &= 200000 (1.025)^2 = 210125 \end{aligned}$$

Required population is 210125.

Question 6. Find the difference between simple profit and compound profit on Tk 1000 in 1 year at 10.50% profit per annum.

Solution : Here, Principal, $P = \text{Tk. } 1000$

$$\begin{aligned} \text{Rate of profit, } r &= 10.50\% \\ &= \frac{10.50}{100} = 0.105 \end{aligned}$$

$$\text{Time, } n = 1 \text{ year}$$

We know, simple Profit, $I = Prn$

$$\begin{aligned} &= \text{Tk. } (1000 \times 0.105 \times 1) \\ &= \text{Tk. } 105 \end{aligned}$$

Compound profit = $P(1 + r)^n - P$

$$\begin{aligned} &= 1000 (1 + 0.105)^1 - 1000 \\ &= 1000 (1.105)^1 - 1000 \\ &= \text{Tk. } (1105 - 1000) \\ &= \text{Tk. } 105 \end{aligned}$$

$$\therefore \text{Difference} = \text{Tk. } (105 - 105) = \text{Tk. } 0$$

Simple profit and compound profit are same. That is, there is no difference.

Question 7. What initial principal makes a compound principal of Tk 20000 in 5 years at 13%?

Solution : Here, compound principal, $C = \text{Tk. } 20000$

$$\text{Rate of profit, } r = 13\% = \frac{13}{100} = 0.13$$

$$\text{Time, } n = 5 \text{ year}$$

$$\text{Initial principal, } P = ?$$

We know, $C = P(1 + r)^n$

$$\text{or, } P = \frac{C}{(1 + r)^n}$$

$$\text{or, } P = \frac{20000}{(1 + 0.13)^5} = \frac{20000}{(1.13)^5} = \text{Tk. } 10855.20 \text{ (approx)}$$

Required initial principal Tk. 10855.20 (approx.)

Question 8. What is the difference between the simple and compound profits of Tk 3000 in 3 years at the rate of 5%?

Solution : Here, $P = \text{Tk. } 3000$

$$r = 5\% = \frac{5}{100} = 0.05$$

$$n = 3 \text{ year}$$

We know,

simple Profit, $I = Prn$

$$\begin{aligned} &= \text{Tk. } (3000 \times 0.05 \times 3) \\ &= \text{Tk. } 450 \end{aligned}$$

And compound profit = $C - P$

$$\begin{aligned} &= P(1 + r)^n - P \\ &= \text{Tk. } \{3000 (1 + 0.05)^3 - 3000\} \\ &= \text{Tk. } \{3000 (1.05)^3 - 3000\} \\ &= \text{Tk. } (3000 \times 1.1576 - 3000) \\ &= \text{Tk. } (3472.875 - 3000) \\ &= \text{Tk. } 472.875 \end{aligned}$$

∴ Difference between simple and compound profit

$$\begin{aligned} &= \text{Tk. } (472.875 - 450) \\ &= \text{Tk. } 22.875 \end{aligned}$$

Required difference between simple profit and compound profit is Tk. 22.875.

Question 9. Find the compound principal of Tk 10,000 at a compound profit of 8.50 per cent per annum in 2 years.

Solution : Here, principal, $P = 10000$ UvKv

$$\text{Rate of profit, } r = 8.50\% = \frac{8.50}{100} = 0.085$$

$$n = 2 \text{ year}$$

We know, compound principal = $P(1 + r)^n$

$$\begin{aligned} &= 10000 (1 + 0.085)^2 \\ &= 10000 (1.085)^2 \\ &= \text{Tk. } 11772.25 \end{aligned}$$

Required compound principal is Tk. 11772.25.

Question 10. What will be the compound profit of Tk 50000 at a compound profit of 4 per cent per annum in 10 years.

Solution : We know,

$$\begin{aligned} \therefore \text{Compound Profit} &= C - P && \text{Here,} \\ &= P(1 + r)^n - P && \text{Principal, } P = \text{Tk. } 50000 \\ &= 50000 (1 + 0.04)^{10} - 50000 && \text{Rate of profit, } r = 4\% = \frac{4}{100} \\ &= 50000 (1.04)^{10} - 50000 && = 0.04 \\ &= \text{Tk. } (74012.214 - 50000) && \text{Time, } n = 10 \text{ year} \\ &= \text{Tk. } 24012.21 \text{ (approx)} && \text{Required compound profit is Tk. } 24012.21 \text{ (approx.).} \end{aligned}$$

- Ques. 03** Amina Begum deposited Tk 9,000 in a bank for 5 years at the rate 12% profit.
- A commodity is sold for Tk 7,500 there is a loss of Tk 900. If it is sold for Tk 8,500, then what will be the gain or loss? (Easy) 2
 - Find the compound profit after 5 years. (Medium) 4
 - In how many years profit-principal will be 1.5 times of the given principal at the same rate of simple profit? (Hard) 4

● Jashore Board 2019

Solution to Question No. 03 :

a Given, selling price = 7500 taka
loss = 900 taka

$$\therefore \text{Cost price} = (7500 + 900) \text{ taka} \\ = 8400 \text{ taka}$$

Again, selling price = 8500 taka.

$$\begin{aligned} \text{Now, profit} &= \text{selling price} - \text{cost price} \\ &= 8500 - 8400 \\ &= 100 \text{ taka (Ans.)} \end{aligned}$$

b Here, Principal, P = Tk. 9000
Time, n = 5 year

$$\text{Rate of profit, } r = 12\% = \frac{12}{100}$$

$$\begin{aligned} \text{We know, Compound principal, } C &= P(1 + r)^n \\ &= \text{Tk. } 9000 \left(1 + \frac{12}{100}\right)^5 \\ &= \text{Tk. } 9000 \left(\frac{100 + 12}{100}\right)^5 \\ &= \text{Tk. } 9000 \left(\frac{112}{100}\right)^5 \\ &= \text{Tk. } 9000 \times (1.12)^5 \\ &= \text{Tk. } 15861.08 \text{ (approx)} \end{aligned}$$

$$\begin{aligned} \therefore \text{Compound profit} &= C - P \\ &= \text{Tk. } (15861.08 - 9000) \\ &= \text{Tk. } 6861.08 \end{aligned}$$

∴ Compound principal after 5 years is 6861.08 taka.

c Here, Rate of profit, $r = 12\% = \frac{12}{100}$
Principal, P = Tk. 9000

$$\begin{aligned} \therefore \text{profit-principal} &= \text{Tk. } \left(9000 \times 1\frac{1}{2}\right) \\ &= \text{Tk. } \left(9000 \times \frac{3}{2}\right) = \text{Tk. } 13500 \end{aligned}$$

∴ Profit, I = Tk. $(13500 - 9000)$ = Tk. 4500

We know, $I = Prn$

$$\text{or, } n = \frac{I}{Pr} = \frac{4500}{9000 \times \frac{12}{100}} \text{ year} = \frac{25}{6} \text{ year} = 4\frac{1}{6} \text{ year}$$

∴ Profit-principal will be double of principal at the end of $4\frac{1}{6}$ years.

- Ques. 04** A person deposited Tk 10,000 in a bank at a fixed rate of simple profit and got Tk 13,750 as profit-principal after 5 years.

- If a product is sold at Tk 850, there is a loss of 15%. Find out the cost price of the product. (Easy) 2
- Find the rate of profit. (Medium) 4
- If the profit-principal given in the stem is deposited in a bank at the rate of profit 10%, what will be the difference between simple profit and compound profit in 3 years? (Hard) 4

● Sylhet Board 2019

Solution to Question No. 04 :

a 15% loss means, if the cost price is Tk. 100, the selling price is Tk. $(100 - 15)$ or, Tk. 85.
Now,

if selling price is Tk. 85 then cost price is Tk. 100

$$\therefore " " " " \text{Tk. } 1 " " " " \text{Tk. } \frac{100}{85}$$

$$\therefore " " " " \text{Tk. } 850 " " " " \text{Tk. } \frac{100 \times 850}{85}$$

or, Tk. 1000.

Therefore, the cost price is Tk. 1000.

b Given, profit-principal = Tk. 13750 and principal = Tk. 10000

$$\therefore \text{Profit} = \text{Tk. } (13750 - 10000) = \text{Tk. } 3750$$

We know, $I = Pnr$

$$\text{or, } r = \frac{I}{Pn}$$

$$\text{or, } r = \frac{3750}{10000 \times 5}$$

$$\text{or, } r = \frac{3}{40} \times 100\%$$

$$\text{or, } r = \frac{15}{2}\%$$

$$\therefore r = 7.5\%$$

∴ Determined rate of profit is 7.5%.

c Here, Principal, P = 13750 taka

$$\text{Rate of profit, } r = 10\% = \frac{10}{100} = 0.1$$

Time, n = 3 year

∴ Simple Profit, $I = Pnr$

$$= 13750 \times 3 \times 0.1 \text{ taka}$$

$$= 4125 \text{ taka}$$

$$\text{Compound profit} = C - P = P(1 + r)^3 - P$$

$$= \{13750 (1 + 0.1)^3 - 13750\} \text{ taka}$$

$$= \{13750 (1.1)^3 - 13750\} \text{ taka}$$

$$= \{13750 \times 1.1 \times 1.1 \times 1.1 - 13750\} \text{ taka}$$

$$= (18301.25 - 13750) \text{ taka} = 4551.25 \text{ taka}$$

∴ Difference between compound and Simple profit = $(4551.25 - 4125)$ taka = 426.25 taka
Difference between compound and Simple profit 426.25 taka.

Ques. 05 At the rate of 10% per annum Tk 25,000 deposited in bank.

- Find the profit-principal for two years. (Easy) 2
- Find the difference of simple profit and compound profit in 3 years. (Medium) 4
- At the same rate of interest how many years will it be 2.5 times of it as profit-principal? (Hard) 4

● Barishal Board 2019

Solution to Question No. 05 :

a. Here, Principal, P = 25000 taka

$$\text{Rate of profit, } r = 10\% = \frac{10}{100} = 0.1$$

Time, n = 2 year

$$\therefore \text{Profit, } I = Prn = 25000 \times 0.1 \times 2 \text{ taka} = 5000 \text{ taka}$$

$$\therefore \text{profit-principal} = \text{principal} + \text{profit} \\ = (25000 + 5000) \text{ taka} = 30000 \text{ taka}$$

∴ Profit-principal after two years is Tk. 30000.

b. Given, Principal, P = 25000 taka

$$\text{Rate of profit, } r = 10\% = \frac{10}{100} = 0.1$$

Time, n = 3 year

$$\therefore \text{simple Profit, } I = Pnr \\ = 25000 \times 3 \times 0.1 \text{ taka} = 7500 \text{ taka}$$

$$\text{and compound profit} = C - P = P(1 + r)^3 - P \\ = \{25000 (1 + 0.1)^3 - 25000\} \text{ taka}$$

$$= \{25000 (1.1)^3 - 25000\} \text{ taka}$$

$$= (25000 \times 1.1 \times 1.1 \times 1.1 - 25000) \text{ taka}$$

$$= (33275 - 25000) \text{ taka} = 8275 \text{ taka}$$

$$\therefore \text{Difference between simple and compound profit is} = (8275 - 7500) \text{ taka} \\ = 775 \text{ taka}$$

∴ Difference between simple and compound profit is : 775 taka.

c. Here, Principal, P = 25000 taka

$$\therefore \text{Profit-Principal, } A = (25000 \times 2.5) \text{ taka} = 62500 \text{ taka}$$

$$\therefore \text{Profit, } I = A - P = (62500 - 25000) \text{ taka} = 37500 \text{ taka}$$

$$\text{Rate of profit, } r = 10\% = \frac{10}{100} = 0.1$$

We know, simple Profit, I = Prn

$$\text{or, } n = \frac{I}{Pr}$$

$$\text{or, } n = \frac{37500}{25000 \times 0.1} \text{ year} = 15 \text{ year}$$

Required time is 15 years.

Ques. 06 A person deposited Tk. 20,000 in a bank at the rate of profit 10% per annum for a certain period.

- Determine profit-principal after one year. (Easy) 2
- How many years will it be twice of it as profit-principal at the 12% of profit? (Medium) 4
- Find the difference between simple profit and compound profit after three years. (Hard) 4

● Dhaka Board 2018

Solution to Question No. 06 :

a. Here, Principal, P = 20,000 taka

$$\text{Rate of profit, } r = 10\% = \frac{10}{100}$$

Time, n = 1 year

$$\therefore \text{simple Profit, } I = Prn = 20,000 \times \frac{10}{100} \times 1 \text{ taka} \\ = 2000 \text{ taka}$$

$$\text{Profit-Principal, } A = P + I = (20,000 + 2000) \text{ taka} \\ = 22,000 \text{ taka}$$

∴ Profit principal at the end of first year is Tk. 22000.

b. Here, Principal, P = 20,000 taka

$$\text{Rate of profit, } r = 12\% = \frac{12}{100}$$

According to question,

$$\text{Profit-Principal, } A = (2 \times 20,000) \text{ taka} \\ = 40,000 \text{ taka}$$

$$\therefore \text{Profit, } I = A - P \\ = (40,000 - 20,000) \text{ taka} = 20,000 \text{ taka}$$

$$\text{Now, Time, } n = \frac{I}{Pr} = \frac{20,000}{20,000 \times \frac{12}{100}} \text{ year}$$

$$= \frac{20,000 \times 100}{20,000 \times 12} \text{ year} = \frac{25}{3} \text{ year} = 8\frac{1}{3} \text{ year}$$

∴ The amount will be double after $8\frac{1}{3}$ year at 12% profit.

c. Here, Principal, P = 20,000 taka

$$\text{Rate of profit, } r = 10\% = \frac{10}{100}$$

Time, n = 3 year

$$\text{Simple Profit, } I = Prn = 20,000 \times \frac{10}{100} \times 3 \text{ taka} \\ = 6000 \text{ taka}$$

Compound principal, C = P(1 + r)ⁿ

$$= 20,000 \left(1 + \frac{10}{100}\right)^3 \text{ taka}$$

$$= 20,000 \left(\frac{100 + 10}{100}\right)^3 \text{ taka}$$

$$= 20,000 \times \left(\frac{110}{100}\right)^3 \text{ taka}$$

$$= 20,000 \times \frac{110}{100} \times \frac{110}{100} \times \frac{110}{100} \text{ taka}$$

$$= 26620 \text{ taka}$$

∴ Compound profit = C - P

$$= (26620 - 20,000) \text{ taka}$$

$$= 6620 \text{ taka}$$

∴ Difference between simple and compound profit

$$= (6620 - 6000) \text{ taka}$$

$$= 620 \text{ taka}$$

∴ Required difference between simple and compound profit 620 taka.



- Ques. 07** Mr Jalil borrows Tk. 'P' at the rate of 10% simple profit. At the end of 5 years he paid of Tk. 12000.
- A pencil was bought in Tk. 20 and sold at a profit of 15%. Then what is the selling price? (Easy) 2
 - Find out the value of P. (Medium) 4
 - At the same rate of profit, find the difference between compound profit and simple profit of Tk. 9000 in 2 years. (Hard) 4

● Chatogram Board 2018

Solution to Question No. 07 :

a. At 15% profit,
buying price is 100 taka, selling price is $(100 + 15)$ or, 115 taka

∴ If buying price is 100 taka, selling price is 115 taka

$$\begin{array}{rcl} " & " & " \\ " & " & 1 \\ " & " & " \end{array} \quad \begin{array}{rcl} " & " & " \\ " & " & 20 \\ " & " & " \end{array} \quad \begin{array}{rcl} " & " & " \\ " & " & " \\ " & " & " \end{array} \quad \begin{array}{c} \frac{115}{100} \\ \times 20 \\ \hline \end{array}$$

Thus, the desired selling price is 23 taka.

b. Here, Principal P taka

$$\text{Rate of profit, } r = 10\% = \frac{10}{100} = \frac{1}{10}$$

$$\text{Profit-Principal, } A = 12000 \text{ taka}$$

$$\text{Time, } n = 5 \text{ year}$$

$$\text{We know, } A = P + I$$

$$\text{or, } 12000 = P + Prn$$

$$\text{or, } 12000 = P(1 + rn)$$

$$\text{or, } 12000 = P \left(1 + \frac{1}{10} \times 5\right) = P \left(1 + \frac{1}{2}\right) = P \left(\frac{2+1}{2}\right)$$

$$\text{or, } 12000 = P \times \frac{3}{2}$$

$$\text{or, } P = \frac{12000 \times 2}{3} = 8000$$

$$\therefore P = 8000$$

The required value, P = 8000 taka.

c. Here, Principal, P = 9000 taka

$$\text{Rate of profit, } r = 10\% = \frac{10}{100} = \frac{1}{10}$$

$$\text{Time, } n = 2 \text{ year}$$

$$\begin{aligned} \text{Simple Profit, } I &= Prn = 9000 \times \frac{1}{10} \times 2 \text{ taka} \\ &= 1800 \text{ taka} \end{aligned}$$

$$\text{Compound principal } C = P(1 + r)^n$$

$$= 9000 \left(1 + \frac{1}{10}\right)^2 \text{ taka}$$

$$= 9000 \left(\frac{10+1}{10}\right)^2 \text{ taka}$$

$$= 9000 \left(\frac{11}{10}\right)^2 \text{ taka}$$

$$= 9000 \times \frac{11}{10} \times \frac{11}{10} \text{ taka}$$

$$= 10890 \text{ taka}$$

∴ Compound profit = $C - P$
 $= (10890 - 9000) = 1890 \text{ taka}$

∴ Difference between compound and simple profit = $(1890 - 1800) \text{ taka} = 90 \text{ taka}$

Difference between compound and simple profit = 90 taka.

- Ques. 08** A person deposited Tk. 6000 in a Bank at the rate of profit Tk. 10 per annum in 3 years.
- Determine the profit-principle at the end of 1st year. (Easy) 2
 - Determine the difference of simple profit and compound profit. (Medium) 4
 - In how many years profit-principle will be 1.5 times of the given principal at the rate of same profit? (Hard) 4

● Dhaka Board 2017

Solution to Question No. 08 :

a. Here, Rate of profit, $r = 10\% = \frac{10}{100} \text{ taka} = \frac{1}{10} \text{ taka}$

Principal, $P = 6000 \text{ taka}$; Time, $n = 1 \text{ year}$

$$\text{Profit, } I = Pnr = 6000 \times 1 \times \frac{1}{10} \text{ taka} = 600 \text{ taka}$$

$$\begin{aligned} \text{Profit-Principal} &= \text{Principal} + \text{profit} \\ &= (6000 + 600) \text{ taka} \\ &= 6600 \text{ taka} \end{aligned}$$

Profit-principal is Tk. 6600 at the end of 1st year.

b. Here, Rate of profit, $r = 10\% = \frac{10}{100} = \frac{1}{10} \text{ taka}$

Principal, $P = 6000 \text{ taka}$, Time, $n = 3 \text{ year}$

$$\begin{aligned} \text{Simple Profit, } I &= Pnr = \frac{600}{6000 \times 3 \times \frac{1}{10}} \text{ taka} \\ &= 1800 \text{ taka} \end{aligned}$$

∴ Compound principal, $C = P(1 + r)^n$

$$= 6000 \left(1 + \frac{1}{10}\right)^3 \text{ taka}$$

$$= 6000 \left(\frac{10+1}{10}\right)^3 \text{ taka}$$

$$= 6000 \times \left(\frac{11}{10}\right)^3 \text{ taka}$$

$$= 6000 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} \text{ taka}$$

$$= 7986 \text{ taka}$$

∴ Compound profit = $C - P$

$$= (7986 - 6000) \text{ taka}$$

$$= 1986 \text{ taka}$$

∴ Difference between simple and compound profit = $(1986 - 1800) \text{ taka} = 186 \text{ taka}$

Difference between simple and compound profit 186 taka.

c. Here, Rate of profit, $r = 10\% = \frac{10}{100} \text{ taka} = \frac{1}{10} \text{ taka}$

Principal, $P = 6000 \text{ taka}$

$$\begin{aligned} \text{Profit-Principal, } A &= \left(6000 \times 1\frac{1}{2}\right) \text{ taka} \\ &= \left(6000 \times \frac{3}{2}\right) \text{ taka} \\ &= 9000 \text{ taka} \end{aligned}$$

Let, Time = n year

We know, Profit-Principal, $A = I + P$

or, $A = Pnr + P$

or, $Pnr = A - P$

$$\text{or, } n = \frac{A - P}{Pr} = \frac{9000 - 6000}{600 \times \frac{1}{10}} = \frac{3000}{600} = 5$$

∴ The profit-principal will be double at the end of 5 years.

Ques. 09 A businessman takes loan from two different bank for Tk. 3,000 at the rate of profit 11% and for Tk. 4,000 at the rate of profit 9% for 2 years.
 a. What will be the profit in the first bank? (Easy) 2
 b. What will be the average percentage of profit? (Medium) 4
 c. Find the difference between simple profit and compound profit for the second bank. (Hard) 4

● Jashore Board 2017

Solution to Question No. 09 :

a. We know,
 profit = npr , where n = Time.

P = principal

r = Rate of interest percent.

Here, $n = 2$ years

P = 3000 taka and

$$r = 11\% = \frac{11}{100}$$

∴ Profit of 3000 taka at 11% profit for 2 years

$$= 2 \times 3000 \times \frac{11}{100} \text{ taka} = 660 \text{ taka.}$$

b. From (a) above,
 profit of 1st bank = 660 taka.

$$\text{Now profit of 2nd bank} = 2 \times 4000 \times \frac{9}{100} \text{ taka} \\ = 720 \text{ taka.}$$

∴ In 2 banks, total principal = $(3000 + 4000)$ taka
 = 7000 taka and total profit = $(660 + 720)$ taka = 1380 taka.

Now, in 2 years, profit of 7000 taka = 1380 taka.

$$\text{in 2 years, profit of 100 taka} = \frac{1380 \times 100}{7000}.$$

$$\text{in 1 years, profit of 100 taka} = \frac{1380 \times 100}{7000 \times 2}. \\ = 9.86 \text{ taka (approx)}$$

c. Here, simple profit of 2nd bank = 720 taka, from (a).

Now, compound profit of 2nd bank = $\{P(1+r)^n - P\}$ taka.

$$\text{Here, } P = 4000 \text{ taka, } n = 2 \text{ years, or } r = \frac{9}{11}.$$

∴ Compound profit of 2nd bank

$$= \left\{ 4000 \left(1 + \frac{9}{100} \right)^2 - 4000 \right\} \text{ taka}$$

$$= \{4000 (1.09)^2 - 4000\} \text{ taka}$$

$$= (4752.4 - 4000) \text{ taka} = 752.4 \text{ taka.}$$

∴ Difference between compound profit and simple profit = $(752.4 - 720.0)$ taka = 32.4 taka.

Ques. 10 Mr. Zadov deposited Tk. 8,000 in a Bank for 3 years at the rate of 10% profit.
 a. Define investment with example. (Easy) 2
 b. Find out the compound principal. (Medium) 4
 c. Compound interest is the how many percentage of the simple interest? Find out it. (Hard) 4

● Cumilla Board 2017

Solution to Question No. 10 :

a. The term investment can be defined as the act of buying something in order to make a profit. If somebody buy a piece of land at some amount of money with a hope that the price of that piece of land will be more in future, then it is said that he has an investment in the deal.

b. We know compound principal = $P(1 + r)^n$, where P = principal, n = Time, r = Rate of profit in percent per year.

Here, P = 8000 taka, n = 3 years and r = 10%

$$= \frac{10}{100} = \frac{1}{10}$$

∴ the required compound principal for 3 years

$$= P(1 + r)^n = 8000 \left(1 + \frac{1}{10} \right)^3 \text{ taka} = 10,648 \text{ taka.}$$

c. Given that,

Principal, P = 8000 taka

Time, n = 3 years

$$\text{Rate, } r = \frac{1}{10}$$

$$\therefore \text{Simple interest} = nPr = 3 \times 8000 \times \frac{1}{10} \text{ taka} \\ = 2400 \text{ taka}$$

And compound profit

$$= P(1 + r)^3 - P$$

$$= \{8000 \left(1 + \frac{1}{10} \right)^3 - 8000\} \text{ taka}$$

$$= 10,648 \text{ taka} - 8000 \text{ taka}$$

$$= 2648 \text{ taka}$$

∴ Compound interest to simple interest

$$= \frac{2648}{2400} = \frac{2648}{24} \% \\ = 110.33\% \text{ (approx.)}$$

Ques. 11 Some principal becomes Tk. 6000 as profit-principal in 4 years and Tk. 6500 as profit-principal in 6 years.

a. What is the profit of 4 years? (Easy) 2

b. Find the principal and the rate of profit. (Medium) 4

c. At the same rate what will be the compound profit in 3 years? (Hard) 4

● Dinajpur Board 2017

Solution to Question No. 11 :

a. According to stem,

$6000 = P + 4 pr$, where P = Principal, r = Rate of interest percent per annum.

And, $6500 = P + 6Pr$, symbols refers to above means.

$$\therefore \frac{6500}{6000} = \frac{P(1+6r)}{P(1+4r)}$$

$$\text{or, } \frac{13}{12} = \frac{1+6r}{1+4r}$$

$$\text{or, } 13(1+4r) = 12(1+6r)$$

$$\text{or, } 13 + 52r = 12 + 72r$$

$$\text{or, } 13 + 52r = 12 + 72r$$

$$\text{or, } 20r = 1$$

$$\text{or, } r = \frac{1}{20}$$

Now, putting $r = \frac{1}{20}$ in $600 = P + 4Pr$

we get,

$$6000 = P \left(1 + 4 \times \frac{1}{20}\right)$$

$$\text{or, } P = \frac{6000 \times 5}{6} = 5000$$

$$\therefore \text{Profit of 4 years} = 5000 \times 4 \times \frac{1}{20} \text{ taka} \\ = 1000 \text{ taka}$$

b From (a) above we have calculated

Principal, $P = 5000$ taka and profit,

$I = 1000$ taka in 4 years

$$r = \frac{1}{20} \text{ or, } 5\%$$

\therefore Principal = 5000 taka and rate = 5%.

c We know, compound profit = $P(1+r)^n$

Here, compound profit = C

Principal, $p = 5000$ taka, from (a) and (b)

$$\text{rate, } r = \frac{1}{20} \text{ or, } 5\%$$

time, $n = 3$ years

$$\therefore C = 5000 \left(1 + \frac{1}{20}\right)^3 \text{ taka} = 5000(1.05)^3 \text{ taka} \\ = 5250 \text{ taka.}$$

Ques. J2 To meet an urgent family need, Saurian takes a loan of taka 'p' at the rate of 6% interest and taka 'q' at 4% interest. She takes in total 56000 taka as a loan and pays tk. 2840 as interest.

- a. What will be annual interest if 8% interest is imposed on total loan? (Easy) 2
- b. Find out the value of 'p' and 'q'. (Medium) 4
- c. How much interest will be paid by Sabina if 5% compound interest is imposed for 2 years? (Hard) 4

Solution to Question No. 12 :

a Given,

Principal, $P = \text{Tk. } 56,000$

Rate of interest, $r = 8\% = \frac{8}{100}$

Time, $n = 1$ year

Interest, $I = ?$

We know,

Interest, $I = Pnr$

$$= 56,000 \times 1 \times \frac{8}{100} \text{ Taka}$$

$$= 4480 \text{ Taka}$$

Ans. Tk. 4480.

b The annual interest on Tk. p at 6%

$$= \text{Tk} \left(p \times 1 \times \frac{6}{100} \right)$$

$$= \text{Tk} \frac{6p}{100}$$

Again, the annual interest on Tk 'q' at 4%

$$= \text{Tk} \left(q \times 1 \times \frac{4}{100} \right)$$

$$= \text{Tk} \frac{4q}{100}$$

Now, according to the information of the stimulus,
 $p + q = 56,000$ ----- (i)

$$\text{And, } \frac{6p}{100} + \frac{4q}{100} = 2,840$$

$$\text{or, } 6p + 4q = 2,84,000$$

$$\text{or, } 3p + 2q = 1,42,000 \text{ ----- (ii)}$$

Now multiply equation (i) by 3 and subtract
 equation (ii)

$$\begin{array}{r} 3p + 3q = 168000 \\ 3p + 2q = 142000 \\ \hline y = 26000 \end{array}$$

Now, putting the value of 'q' in equation (i)

We get, $p = 30,000$

$\therefore p = \text{Tk. } 30,000$ and $q = \text{Tk. } 26,000$

c Given,

Total amount of loan, $P = \text{Tk. } 56,000$

Rate of interest, $r = 5\% = \frac{5}{100}$

Time, $n = 2$ years

We know,

Compound interest = $P(1+r)^n - P$

i. Compound interest for 2 years

$$= \left\{ 56,000 \left(1 + \frac{5}{100}\right)^2 - 56,000 \right\} \text{ Taka}$$

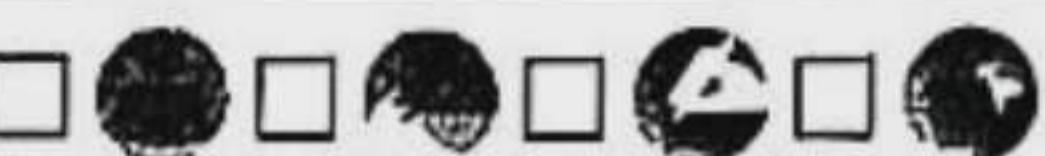
$$= \{56,000 (1.05)^2 - 56,000\} \text{ Taka}$$

$$= \text{Tk. } 5740$$

\therefore Sabina will pay Tk. 5740 as interest after 2 years.

Ans. Tk. 5740.

Appendix

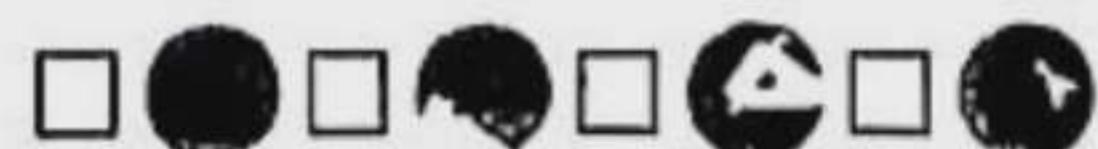
Multiple Choice Q/A
Designed as per topic


1. What is made when selling price is more than cost price of a thing? *(Easy)*
 @ Loss Ⓛ Profit
 Ⓜ No loss or profit Ⓝ All the above
2. If cost price of a castrated goat is Tk. 2220 and selling price is Tk. 2175, then what is made in the deal? *(Medium)*
 @ Tk. 35 is made loss
 Ⓛ Tk. 45 is made profit
 Ⓜ Tk. 35 is made profit
 Ⓝ Tk. 45 is made loss
3. What is called tax payable at a fixed rate with the cost price of a thing? *(Easy)*
 @ Total cost price Ⓛ Profit
 Ⓜ Loss Ⓝ VAT
4. If cost price of twenty bananas is Tk. 100 and its selling price is Tk. 120. What is the profit? *(Easy)*
 @ Tk. 10 Ⓛ Tk. 20
 Ⓜ Tk. 25 Ⓝ Tk. 30
5. If 15 pieces of wood pencils are bought at the rate of Tk. 12 per piece and are sold all the pencils at Tk. 220, what is the profit? *(Medium)*
 @ Tk. 50 Ⓛ Tk. 40
 Ⓜ Tk. 10 Ⓝ Tk. 20
6. What is the full name of the term 'VAT'? *(Easy)*
 @ Value Added Tax Ⓛ Value of A Thing
 Ⓜ Value After Tax Ⓝ Non of the above

7. i. Selling price = cost price + profit when profit is made.
 ii. Cost price = selling price + loss when loss is made.
 iii. If cost price of a thing is Tk. 93 and its selling price is Tk. 107, then loss increased in the deal is Tk. 14.

Which one of the following is correct? *(Hard)*

8. Ⓛ i Ⓛ i & ii Ⓜ ii & iii Ⓝ i, ii & iii
 - i. The cost of a car is Tk. 5 lac and its selling price is $\frac{24}{25}$ of cost price. So, its selling price is Tk. 4,80,000.
 ii. 50 kg of rice is bought at Tk. 40 per kg and then is sold the total rice at a profit of Tk. 3 per kg. So, total profit is Tk. 150.
 iii. The term VAT refers to Very Attractive Tax.
- Which one of the following is correct? *(Hard)***
9. Ⓛ i & ii Ⓛ i & iii Ⓜ ii & iii Ⓝ i, ii & iii
 - **Answer questions from 09 to 11 :**
 An orange seller bought 100 oranges for Tk. 1250 and sold it at Tk. 1500.
 10. **What was the cost price per four orange? *(Easy)***
 Ⓛ Tk. 45 Ⓛ Tk. 50 Ⓜ Tk. 55 Ⓝ Tk. 60
 11. **What is the profit per orange? *(Easy)***
 Ⓛ Tk. 3.00 Ⓛ Tk. 2.50
 Ⓜ Tk. 3.25 Ⓝ Tk. 2.75
 12. **To make 10% profit, what should be the selling price per piece of orange? *(Medium)***
 Ⓛ Tk. 13.25 Ⓛ Tk. 13.50
 Ⓜ Tk. 13.75 Ⓝ Tk. 13.60

Short Q/A
Designed as per topic


Question 1. If 25 oranges are bought at Tk. 100 and sold 20 oranges at Tk. 100, what is the profit or loss in 1 orange?

Solution : Cost price of 25 orange 100 taka

$$\therefore \text{Cost price of 1 orange } \frac{100}{25} \text{ taka} = 4 \text{ taka}$$

$$\begin{aligned}\therefore \text{Selling price of 1 orange } &\frac{100}{20} \text{ taka} \\ &= 5 \text{ taka}\end{aligned}$$

$$\begin{aligned}\therefore \text{profit} &= \text{selling price} - \text{cost price} \\ &= (5 - 4) \text{ taka} = 1 \text{ taka}\end{aligned}$$

Profit is 1 taka.

Question 2. A fruitseller bought 1 hali at Tk. 25 and sold 1 hali at Tk. 27. If he made profit of Tk. 50. How many hali of bananas did he buy?

Solution : Cost price of one hali banana = 25 taka and selling price of one hali banana = 27 taka

$$\therefore \text{Profit} = (27 - 25) \text{ taka} = 2 \text{ taka.}$$

2 taka profit in 1 hali

$$\therefore 50 \text{ " } " \frac{1 \times 50}{2} \text{ " } = 25 \text{ hali}$$

\therefore He bought 25 hali of bananas.

Question 3. Mr. Rahman bought 5 kg sweets at Tk. 300 per kg and 4% VAT. How much money did he spend as VAT?

Solution : Price of 1 kg sweets 300 taka

$$\therefore \text{Price of 5 kg sweets} = (300 \times 5) \text{ taka} \\ = 1500 \text{ taka}$$

$$\therefore \text{amount of VAT} = 4\% \text{ of } 1500$$

$$= \left(1500 \times \frac{4}{100} \right) \text{ taka} = 60 \text{ taka}$$

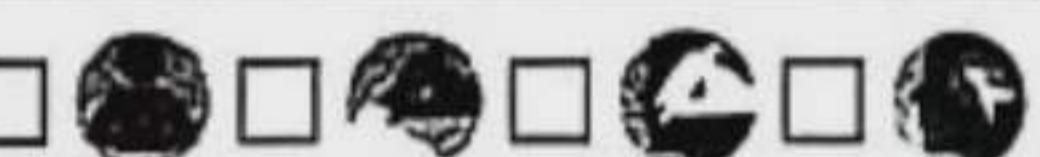
Amount of VAT is Tk. 60.



Creative Q/A



Designed as per learning outcomes



Ques. 01 Faruk bought 5 kg sweets at 350 taka per kg. VAT is 4%.

- a. What is VAT? (Easy) 2
- b. If 10% discount is added, what is the price of sweets? (Medium) 4
- c. How much money did he pay including VAT? (Hard) 4

Solution to Question No. 01 :

- a. The tax included with cost price of any commodity is called VAT.
- b. Price of 1 kg sweet = 350 taka
 $\therefore 5 \text{ " } " = (350 \times 5) = 1750 \text{ taka}$
 \therefore If cost price is 100 taka, selling price at 10% discount = $(100 - 10) = 90 \text{ taka}$

If cost price 100 taka discount price = 90 taka

$$\therefore 100 \text{ " } " 1 \text{ " } " = \frac{90}{100} \text{ " }$$

$$\therefore 1750 \text{ " } " = \frac{90 \times 1750}{100} \text{ " } \\ = 1575 \text{ taka}$$

c. From 'b', cost price is 1750 taka

$$\text{VAT} = 4\% \text{ of } 1750$$

$$= \frac{4}{100} \times 1750 \text{ taka}$$

$$= 70 \text{ taka}$$

$$\text{Total price} = (1750 + 70) \text{ taka}$$

$$= 1820 \text{ taka}$$



Super Suggestions



Super Suggestions with 100% preparatory questions selected by the Master Trainer Panel

Dear learners, important multiple choice, short and creative questions of this chapter selected by Master Trainer Panel for Half-Yearly and Annual Exams are presented below. Learn the answers to the mentioned questions well to ensure 100% preparation.

Question Pattern	7★	5★	3★
● MCQs with Answers	Learn each MCQs in this chapter thoroughly.		
● Short Q/A	Exercise 2.1	2, 7, 12, 17	5, 11, 15, 18
	Exercise 2.2	3, 8	4, 9
	Appendix	1, 3	2
● Creative Q/A	Exercise 2.1	1, 3	2
	Exercise 2.2	1, 8, 12	3, 10
	Appendix		1



Assessment & Evaluation



A question bank presented in the form
of a class test to assess the preparation

Class Test

Time : 3 hours

Mathematics

Class : Eight

Full marks : 100

Multiple Choice Questions (Each question carries 1 mark)

$1 \times 30 = 30$

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. $24\% = ?$
 - A $\frac{6}{25}$
 - B $\frac{4}{25}$
 - C $\frac{12}{25}$
 - D $\frac{3}{25}$
2. 12% loss has been incurred when a thing has been sold at Tk. 792. What is the cost price of the thing?
 - A Tk. 800
 - B Tk. 820
 - C Tk. 860
 - D Tk. 900
3. What happens when selling price is less than cost price?
 - A Loss
 - B Profit
 - C No loss/profit
 - D All the above
4. 5 pieces are bought at Tk. 1 and 4 pieces are sold at Tk. 1. What will be the percentage of profit?
 - A 20%
 - B 25%
 - C 80%
 - D 125%
5. The cost price of something is 3 pieces at Tk 1 and selling price is 2 pieces at Tk 1. What will be the percentage of profit or loss?
 - A Profit 50%
 - B Loss 50%
 - C Profit $33\frac{1}{3}\%$
 - D Loss $33\frac{1}{3}\%$
6. Which is the 5% of Tk. 1200?
 - A Tk. 60
 - B Tk. 6
 - C Tk. 50
 - D Tk. 5
7. Which one of the following is 150% of Tk. 50?
 - A 50
 - B 75
 - C 100
 - D 150
8. Cost price Tk. 1000, at the loss of 12% what will be the selling price?
 - A Tk. 988
 - B Tk. 880
 - C Tk. 88
 - D Tk. 8.80
9. In case of interest—.
 - i. $I = Pm$
 - ii. $I = A - P$
 - iii. $I = C - P$

Which one is correct?

 - A i & ii
 - B i & iii
 - C ii & iii
 - D i, ii & iii
10. What is the simple profit of Tk 3,000 in 2 years at the rate of simple profit of 6% per annum?
 - A Tk 36
 - B Tk 90
 - C Tk 180
 - D Tk 360
11. What is the simple profit of Tk 2,500 in 7 years at the rate of simple profit of 15%?
 - A 105
 - B 175
 - C 375
 - D 2625
12. What is the years at principal Tk. 1200 and the simple profit Tk. 480 at the rate of simple profit 10% per annum?
 - A 2 years
 - B 4 years
 - C 6 years
 - D 8 years
13. In how many years the simple profit of Tk. 10,000 will be Tk. 4800 at a rate of 12%?
 - A 2 years
 - B 4 years
 - C 6 years
 - D 8 years
14. Answer to the questions No. 14 and 15 based on the following information :
The profit-principal of some amount for 5 years is Tk 15,000. The profit is $\frac{1}{4}$ part of the principal.
15. What is the principal?
 - A Tk 1,000
 - B Tk 1,200
 - C Tk 10,000
 - D Tk 12,000

15. What is the rate of profit?
 - A 3%
 - B 4%
 - C 5%
 - D 6%
16. What is simple profit of Tk. 1500 in 3 years at the rate of simple profit of 10% per annum?
 - A Tk. 1050
 - B Tk. 496.5
 - C Tk. 450
 - D Tk. 266.70
17. In how many years will the profit of Tk. 750 be Tk. 225 at the rate of 10%? Which one is correct?
 - A 3
 - B 4
 - C 5
 - D 8
18. What is the rate of profit by which the profit of Tk. 4000 will be Tk. 1200 in 4 years?
 - A 30%
 - B 13.33%
 - C 12%
 - D 7.5%
19. The commodity is bought at 60 Tk. and is sold at 57 Tk. What will be the percentage of loss?
 - A 4%
 - B 5%
 - C 6%
 - D 7%
20. 2 pieces are bought it Tk 1 and 3 pieces are sold for taka. What will be the percentage of profit or loss?
 - A Loss $33\frac{1}{3}\%$
 - B Profit $33\frac{1}{3}\%$
 - C Profit 50%
 - D Loss 50%
21. Answer the questions No. 21 and 22 in the light of the following information :
A person deposited Tk. 2,000 in a bank at the rate of profit 8% for 3 years.
22. What is the simple profit?
 - A 160 taka
 - B 480 taka
 - C 840 taka
 - D 1600 taka
23. The purchasing price of a thing is called — price.
 - A actual
 - B cost
 - C selling
 - D none of the above
24. If a thing was sold at Tk 2375 at the loss of 5%, what was the cost price?
 - A Tk 2400
 - B Tk 2450
 - C Tk 2475
 - D Tk 2500
25. If the ratio of cost price and selling price is 5 : 6, then what is the profit in percentage?
 - A 10
 - B 20
 - C 25
 - D 30
26. If the rate of simple profit is 10% per annum, what will be the profit of Tk 1,200 in 4 years?
 - A Tk 1680
 - B Tk 480
 - C Tk 120
 - D Tk 48
27. 7% of which amount will be Tk. 420?
 - A Tk. 6294
 - B Tk. 6000
 - C Tk. 2960
 - D Tk. 1200
28. A shirt is sold Tk. 850 at the loss of 15%. Which one of the following is the cost price of the shirt?
 - A Tk. 800
 - B Tk. 1000
 - C Tk. 1100
 - D Tk. 1250
29. If the selling price is Tk. 550 and cost price is Tk. 500 then profit is—
 - A 12%
 - B 10%
 - C 8%
 - D 5%
30. If a pencil is sold at Tk 11, there is a profit 10%. What was the cost price of the pencil?
 - A Tk 1
 - B Tk 10
 - C Tk 12
 - D Tk 21

Short-Answer Question (Each question carries 2 marks)**Answer any 10 of the following questions :**

1. What does investment mean? What does profit or loss depend on?
2. If a banana seller buys 2 dozen bananas at the rate of Tk 75 per dozen and sells them at Tk 180, how much profit or loss will he make?
3. A goat was sold at a loss of 10%. If it were sold at Tk 1000 more, there would be a profit of 10%. Find the cost price of the goat.
4. If a product is bought for Tk 60 and sold for Tk 50, what percentage profit or loss will be?
5. A businessman buys 25 kg rice and sells 20 kg at the cost price. What percentage of profit will be?
6. If an orange seller buys oranges at the rate of Tk 18 per quad and sells a score for Tk 100, how much profit will he make per quad?
7. How much profit will be made if one buys 50 litchis for Tk 100 and sells 20 pieces for Tk 50?
8. What is the profit of Tk 2500 for 7 years at 15% simple profit per annum?

 $2 \times 10 = 20$

9. If the rate of profit is $9\frac{1}{2}\%$ per annum, what amount will make profit Tk. 2850 in 6 years?
10. In how many years will the profit of Tk 6000 be Tk 2700 at the rate of profit 9% per annum?
11. The profit-principal of some principal is Tk 9900 in 3 years. If the profit is $\frac{4}{7}$ of the principal, find the principal?
12. Write the formula of finding principal with description of symbols.
13. For what percentage of profit per annum, some principal will be double in profit-principal in 5 years?
14. For what percentage of profit per annum, Tk 15000 will be Tk 20850 in profit-principal in 6 years?
15. What is the profit of Tk 8000 in 2 years and 6 months at a profit of $12\frac{1}{2}\%$ per annum?

Creative Question (Each question carries 10 marks)**Answer any 5 of the following questions :**

1. The profit-principal of some principal is Tk. 11000 in 6 years. The profit is $\frac{3}{8}$ part of the principal.
 - a. Determine the principal and the rate of profit. 2
 - b. Determine the principal and the rate of profit. 4
 - c. If the principal and the profit-principal are the buying and selling price of a goat respectively, determine the rate of profit. 4
2. Profit principal of 5 years is 16800 taka and profit principal of 3 years is 15200 taka.
 - a. What is the simple profit of 6500 taka at 10.50% profit for 6 months? 2
 - b. Find principal and profit. 4
 - c. When profit principal will be double of principal at $12\frac{1}{2}\%$ profit. 4
3. A thing was sold at the loss of Tk 8%. If the thing was sold at Tk 800 more, there would be a profit of Tk 8%. Tk 6000 was deposited in the bank at the rate of 6% profit per annum for 2 years.
 - a. Find the simple profit of Tk 7000 at the rate of 5% per annum in years. 2
 - b. Find the cost price of the thing. 4
 - c. Find the compound profit. 4
4. A person deposited Tk 10,000 in a bank at a fixed rate of simple profit and got Tk 13,750 as profit-principal after 5 years.
 - a. If a product is sold at Tk 850, there is a loss of 15%. Find out the cost price of the product. 2
 - b. Find the rate of profit. 4

 $10 \times 5 = 50$

- c. If the profit-principal given in the stem is deposited in a bank at the rate of profit 10%, what will be the difference between simple profit and compound profit in 3 years? 4
5. Mr. Jalil borrows Tk. 'P' at the rate of 10% simple profit. At the end of 5 years he paid of Tk. 12000.
 - a. A pencil was bought in Tk. 20 and sold at a profit of 15%. Then what is the selling price? 2
 - b. Find out the value of P. 4
 - c. At the same rate of profit, find the difference between compound profit and simple profit of Tk. 9000 in 2 years. 4
6. At the rate of 10% per annum Tk 25,000 deposited in bank.
 - a. Find the profit-principal for two years. 2
 - b. Find the difference of simple profit and compound profit in 3 years. 4
 - c. At the same rate of interest how many years will it be 2.5 times of it as profit-principal? 4
7. A businessman takes loan from two different bank for Tk. 3,000 at the rate of profit 11% and for Tk. 4,000 at the rate of profit 9% for 2 years.
 - a. What will be the profit in the first bank? 2
 - b. What will be the average percentage of profit? 4
 - c. Find the difference between simple profit and compound profit for the second bank. 4
8. To meet an urgent family need, Saurian takes a loan of taka 'p' at the rate of 6% interest and taka 'q' at 4% interest. She takes in total 56000 taka as a loan and pays tk. 2840 as interest.
 - a. What will be annual interest if 8% interest is imposed on total loan? 2
 - b. Find out the value of 'p' and 'q'. 4
 - c. How much interest will be paid by Sabina if 5% compound interest is imposed for 2 years? 4

Answer Sheet ▶ Multiple Choice Questions

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

Solving Reference ▶ Short-Answer Questions

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|---------------------------|---------------------------|----------------------------|----------------------------|
| 1 ▶ See Page 39; Ques. 01 | 5 ▶ See Page 40; Ques. 07 | 9 ▶ See Page 40; Ques. 12 | 13 ▶ See Page 41; Ques. 17 |
| 2 ▶ See Page 39; Ques. 02 | 6 ▶ See Page 40; Ques. 08 | 10 ▶ See Page 41; Ques. 14 | 14 ▶ See Page 41; Ques. 18 |
| 3 ▶ See Page 39; Ques. 03 | 7 ▶ See Page 40; Ques. 09 | 11 ▶ See Page 41; Ques. 15 | 15 ▶ See Page 41; Ques. 19 |
| 4 ▶ See Page 39; Ques. 05 | 8 ▶ See Page 40; Ques. 10 | 12 ▶ See Page 41; Ques. 16 | |

Solving Reference ▶ Creative Questions

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|---------------------------|---------------------------|---------------------------|---------------------------|
| 1 ▶ See Page 42; Ques. 01 | 3 ▶ See Page 51; Ques. 02 | 5 ▶ See Page 54; Ques. 07 | 7 ▶ See Page 55; Ques. 09 |
| 2 ▶ See Page 43; Ques. 03 | 4 ▶ See Page 52; Ques. 04 | 6 ▶ See Page 53; Ques. 05 | 8 ▶ See Page 56; Ques. 12 |

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