Lecture-6 : Profit & Loss (Written)

Teacher's Work

01. A trader, while selling an item, was asking for such a price that would enable him to offer a 20% discounts and still make a profit of 30% on cost. If the cost of the item was Tk. 50 what was his asking price? [BB (AD) 08, Standard Bank (TAO) 16, Pubali JO (Cash) 11, Premier Bank (JO) 19]

02. A man sells articles at a profit of 25%. If had bought it at 20% less and sold it for tk. 10.50 less, he would have gained 30%. Find the cost price of the article? [BB AD 17]

03. An article is sold at 20% profit. If its cost price is increased by tk. 50 and at the same time if its selling price is also increased by tk. 30, the percentage of profit decreases by $3\frac{1}{3}$ %. Find the cost price?

04. The percentage profit earned by selling an article for Tk. 1920 is equal to the percentage loss incurred by selling the same article for Tk 1280. At what price should the article be sold to make 25% profit [South East Bank MTO 13, BB AD (ff) 15, SJIB MTO 13, IBBL PO 19]

05. On selling a chair at 5% loss and a table at 15% gain, a man gains Tk 7. If he sells the chair at 5% gain and the table at 10% gain, then he gains TK 13. The actual price of the table is?

06. A dealer buys dry fruits at the rate of Tk. 100, Tk. 80 & Tk. 60 per kg. He bought them in the ratio 12:15:20 by weight. He in total gets 20% profit by selling the 1st two & at last he finds he has no gain & no loss in selling the whole quantity which he had. What was the percentage loss he suffered for the third quantity? [Janata (EO) 18]

07. If 12 candies are sold for Tk. 10 then there is a loss of x%. If 12 candies are sold for Tk. 12 than there is a profit of x%. What is the value of x? [Dhaka Bank TAO 18, SEBL (PO) 17, Standard Bank (TAO) 18]

08. A shopkeeper sells two shirts at the same price. He makes 10% profit on one and loses 10% on the other. How much in percentage does he gain or lose? [Agrani SO (Auditor) 17, Rupali (Cash) 18]

09. A retailer buys 40 pens at the market price of 36 pens from a wholesaler. If he sells these pens giving a discount of 1%, what is the profit percent? [Pubali (Cash) 16]

10. The cost price of 10 pens is the same as the selling price of n pens. If there is a loss of 40%, approximately what is the value of n? [BEZA AM 20, Dhaka Bank TO 19, BSEC (PA) 2021]

11. A trade man gives 4% discount on the market price and gives 1 article free for buying every 15 articles and thus gains 35%. The marked price is above the cost price by what percent?

Illustrative Questions

01. A seller incurs a loss of 15% when a table is sold at Tk. 10,200. At what price the table should be sold to make a profit of 35%?

Sol. Let, cost price be Tk. 100

$\therefore$ Selling price at 15% loss is (100-15)= Tk. 85

If selling price is Tk. 85, cost price is Tk. 100

If selling price is Tk.10200, cost price is Tk $\frac{100\times10200}{85}$

= Tk. 12000

At 35% profit,

Now if cost price Tk. 100, selling price Tk. 135

$\therefore$ If cost price Tk.12,000, selling price Tk $\frac{12000\times135}{100}$

= Tk. 16,200

Ans: Tk. 16,200

02. An article is sold at 20% profit. If its cost price is increased by Tk. 50 and at the same time if it selling price is also increased by Tk. 30, the percentage of profit decreses by $3\frac{1}{3}$ %. Find the cost price.

Sol. Let, the cost price be Tk. x

Selling price = 120% of Tk. x = Tk. 1.2x

Profit = Tk. (1.2x-x) = 0.2x

New cost price = Tk. (x+50)

New selling price = Tk. (1.2x + 30)

New profit = (1.2x + 30) – (x+50) = Tk. (0.2x-20)

According to the question,

$$\frac{0.2x-20}{x+50} = (20-3\tfrac{1}{3})\%.$$

$$\text{Or, } \frac{0.2x-20}{x+50} = \frac{50}{3}\times\frac{1}{100} = \frac{1}{6}$$

$$\text{Or, } \frac{0.2x-20}{x+50} = \frac{1}{6}$$

Or, $1.2x - 120 = x + 50$

Or, $1.2x - x = 50 + 120$

Or, $0.2x = 170$

$\therefore x = \frac{170}{0.2} = 850$

$\therefore$ The cost price = Tk. 850 **(Ans)**

03. A man sells an article at a profit of 20%. If he had bought it at 20% less and sold for Tk. 37 less, he would have gained 25%. Find the cost price of the article.

Sol. Let the C.P be Tk. x. Then, S.P. = Tk (120% of x)

$= \text{Tk}\left(\frac{120}{100} \times x\right) = \text{Tk}\,\frac{6x}{5}$

Now C.P. = 80% of Tk x = $\text{Tk}\left(x \times \frac{80}{100}\right) = \text{Tk}\,\frac{4x}{5}$.

C.P = $\text{Tk}\,\frac{4x}{5}$, Gain = 25%.

Nes S.P.= 125% of $\text{Tk}\,\frac{4x}{5} = \text{Tk}\left(\frac{4x}{5} \times \frac{125}{100}\right) = \text{Tk}\,x$.

$\therefore x - \frac{4x}{5} = 37 \Rightarrow x = 185.$

$\therefore$ C.P. = Tk 185 **(Ans)**

04. An article is sold at a certain price. By selling it at $\frac{2}{3}$ of that price one loses 10%. Find the gain percent at original price.

Sol. Let the original S.P. be Tk x. Then, New S.P. = $\text{Tk}\,\frac{2}{3}$ x, Loss = 10%.

So, C.P. = $\text{Tk}\left(\frac{100}{90} \times \frac{2x}{3}\right) = \frac{20x}{27}$.

Now, C.P. = $\text{Tk}\,\frac{20x}{27}$, S.P. = Tk x.

Gain = $\text{Tk}\left(x - \frac{20x}{27}\right) = \text{Tk}\,\frac{7x}{27}$.

$\therefore$ Gain% = $\frac{\frac{7x}{27}}{\frac{20x}{27}} = \left(\frac{7x}{27} \times \frac{27}{20x} \times 100\right)\% = 35\%$

Ans: 35%

05. A man sells an article at a profit of 25%. If he had bought it at 20% less and sold it for Tk 10.50 less, he would have gained 30%. Find the cost price of the article.

Sol. Let the C.P be Tk x.

1st S.P. = 125% of $x = \frac{125}{100}x = \frac{5x}{4}$

Now, 2nd C.P. = 80% of $x = \frac{80}{100}x = \frac{4x}{5}$.

2nd S.P = 130% of $\frac{4x}{5} = \left(\frac{130}{100} \times \frac{4x}{5}\right) = \frac{26x}{25}$.

$\therefore \frac{5x}{4} - \frac{26x}{25} = 10.50$

$\Leftrightarrow \frac{21x}{100} = 10.5$

$\Leftrightarrow x = \left(\frac{10.50 \times 100}{21}\right) = 50.$

Hence, C.P. = Tk 50. **(Ans)**

06. Two-thirds of a consignment was sold at a profit of 5% and the remainder at a loss of 2%. If the total profit was Tk 400, find the value of the consignment.

Sol. Let the value of the consignment be Tk. x.

C.P. of $\frac{2}{3}$ rd = $\text{Tk}\,\frac{2x}{3}$; C.P. of $\frac{1}{3}$ rd = $\text{Tk}\,\frac{x}{3}$.

Total S.P = Tk $\left[\left(105\% \text{ of } \frac{2x}{3}\right) + \left(98\% \text{ of } \frac{x}{3}\right)\right]$

$= \text{Tk}\left(\frac{7x}{10} + \frac{49x}{150}\right) = \text{Tk}\left(\frac{154x}{150}\right) = \text{Tk}\left(\frac{77x}{75}\right)$.

Gain = $\text{Tk}\left(\frac{77x}{75} - x\right) = \text{Tk}\,\frac{2x}{75}$.

$\therefore \frac{2x}{75} = 400$

$\Rightarrow x = \left(\frac{400 \times 75}{2}\right) = 15000.$

Hence, value of the consignment = Tk 15000. **(Ans)**

07. When a producer allows 36% commission on the retail price of his product, he earns a profit of 8.8%. What would be his profit percent if the commission is reduced by 24%?

Sol. Let retail price = Tk 100. Then, commission = Tk 36.

$\therefore$ S.P. = Tk (100–36) = Tk 64. But, profit = 8.8%.

$\therefore$ C.P = $\text{Tk}\left(\frac{100}{108.8} \times 64\right) = \text{Tk}\,\frac{1000}{17}$.

New commission = Tk (36–24) =Tk 12.

New S.P. = Tk (100 –12) = Tk 88.

Gain = $\text{Tk}\left(88 - \frac{1000}{17}\right) = \text{Tk}\,\frac{496}{17}$.

$\therefore$ Gain % = $\left(\frac{496}{17} \times \frac{17}{1000} \times 100\right)\% = 49.6\%$ **Ans.**

08. A dishonest merchant makes a 10% profit at the time of Buying and a 5% loss at the time of selling the goods he/she trades. By doing so it the said merchant made a profit of Tk. 900 on a particular item, what was the real cost of item sold?

Sol. Let, the real cost = Tk. 100.

The showing price = Tk. (100 × 110%) = Tk. 110.

At 5% loss, the selling price be = 95% of 110=104.5

Then the ultimate profit = Tk. (10-5.5) = Tk. 4.5.

So, When profit is Tk. 4.5, then real cost = Tk. 100.

$\therefore$ When profit is Tk. 900, then real cost = $\frac{100 \times 900}{4.5}$

= Tk. 20,000

Ans: Tk. 20,000

09. A grocer sells rice at a profit of 10% and uses weights which are 20% less than the market weight. The total gain earned by him will be-

Sol. Let us consider a packet of rice marked 1 kg.

Its actual weight is 80% of 1000 gm = 800gm

Let, C.P. of each gm be Tk. 1

Then, C.P. of this packet = Tk. 800

S.P. of this packet = 110% of C.P. of 1 kg

$= \left(\frac{110}{100} \times 1000\right)$ = Tk. 1100

$\therefore$ Gain = Tk (1100–800) = Tk 300

$\therefore$ Gain % = $\left(\frac{300}{800} \times 100\right)$ % = 37.5%

Ans: 37.5%

10. A dishonest dealer sells the goods at $6\frac{1}{4}$ % loss on cost price but uses $12\frac{1}{2}$ % less weight. What is his percentage profit or loss?

Sol. Let us consider a packet of rice marked 1 kg

Its actual weight is $(100-12\frac{1}{2})$% = 87.5% of 1000gm

= 875 gm

Let, C.P. of each gm be Tk. 1

$\therefore$ C.P of this packet = Tk (875 × 1) = Tk 875

$\therefore$ S.P. of this packet = $(100-6\frac{1}{4})$% of C.P. of 1 kg

$= \text{Tk}\left(\frac{400-25}{4} \times \frac{1}{100} \times 1000\right)$

$= \text{Tk}\left(\frac{375}{400} \times 1000\right)$

= Tk 937.5

$\therefore$ Gain = Tk (937.5–875) = Tk 62.5

$\therefore$ Gain % = $\left(\frac{62.5}{875} \times 100\right)$ % = $7\frac{1}{7}$ % **(Ans)**

Home Practice

01. A trader purchases a watch and a wall clock for Tk. 390. He sells them making a profit of 10% on the watch and 15% on the wall clock. He earns a profit of Tk. 51.50. The difference between the original price of the wall clock and the watch is equal to? [SBL FF (SO) 19] **Tk. 110**

02. On a certain product, the producer, the wholesaler and the retailer make a profit of 10%, 5% and 10% respectively. If the retail price of the product is Tk. 200, what is the manufacturing cost of the product? [RAKUB (SO) 11, BEPZA (AM) 15] **Tk. 157.41**

03. A good has been sold at a loss of 12%. If it could be sold by Tk. 1000 more, there would have been profit of 8%. What is the cost price of that goods? [Combined officer 08, RAKUB (SO) 10] **Tk. 5000**

04. A trade while selling an item was asking for such a price that would enable him to offer a 10% discount and still make a profit of 20%. If the cost of the product was Tk.50, what was his asking price? [BB (Off) 01] **Tk. 66.67**

05. In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit now? [PKB (SEO) 18, Jamuna Bank (PO) 12, BHBFC (SO) 15, Janata (AEO) 20] **70.24%**

06. A shopkeeper bought 84 identical shirts priced at Tk. 240 each. He spent a total of Tk. 3200 on transportation and packaging. He put the label of marked price of Tk. 420 on each shirt. He offered a discount of 15% on each shirt at the marked price. What is the total profit of the shopkeeper in the whole transaction? [SBL FF (Cash) 19] **Tk. 6628**

07. A person sold two articles. Each for the same price of Tk. 1040. He incurs 20% loss on the first and 10% loss on the second. Find his overall percentage of loss. [BB (officer) 15] **15.29%**

08. A video magazine distributor made 3500 copies of the May issue of the magazine at a cost of Tk. 4,00,000. He gave 5000 cassettes free to some key video libraries. He also allowed a 25% discount on the market price of the cassette. In this manner, he was able to sell all the 3500 cassettes that were produced. If the markup price of a cassettes was Tk. 160, what is his gain or loss for the May issue of the video magazine? [NBL (PO) 15] **Loss Tk. 40,000**

09. A person bought an article and sold it at a loss of 10%. If he had bought if for 20% less and sold it for Tk. 55 more, he would have made a profit of 40%. What was the cost of the article? [Pubali (SO) 2011]

Tk. 250

10. A book and a pen were sold for Tk. 3040 making a profit of 25% on the book and 10% on the pen. By selling them for Tk. 3070, the profit realizes would have been 10% on the book and 25% on the pen. Find the cost of each. [SEBL (PO) 16]

Book Tk. 1200, pen tk 1400.

11. Sagar purchased a product and sold at a loss of 10%. If the selling price were increased by Tk. 45, there would have been a 5% profit. What was the purchased price of the product? What would be the selling price of the product if he wants to make a profit of 20% [Exim Bank (MTO) 2010]

Tk.300, Tk. 360

12. A shopkeeper buys pens which are Tk. 360 a dozen, He quotes a selling price the customers and offers a discount of 10% realizing that even with the discount he can earn a profit of 20%. What was the initial selling price of each pen quoted by him? [Natinal Bank (PO) 14, BKB Supervisor 12] **Tk. 40**

13. You purchase some apple at the rate of Tk. 12 for 20 apples and sell all of them at the rate of Tk. 20 per dozen. What is your profit/loss in percentage? [City Bank (Officer) 96] **177.77%**

14. 10% fruit of a seller was damaged during transportation, another 15% was rotten. At what profit in percentage should he sell rest fruit so that he can make an overall profit of 20%? **Tk. 60%**

15. 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. If the salesman sold all bananas, how much would be profit% or loss% [Class 8 (2.1)] **4%**

16. A shopkeeper lost 7.5% by selling an article. If he had bought it at 10% less and sold it for Tk. 31 more, he would have gained 20%. Find the cost price of the article. **Tk. 20**

17. The cost price of two watches taken together in Tk. 840. If by selling one at profits of 16% and the other at loss 12%, there is no loss and gain in the whole transaction. Find the cost price of two watches.

Tk. 360, & Tk 480

18. The cost price of two watches taken together is Tk. 840. If by selling one at a profit of 16% and the other at a loss of 12%, there is no loss or gain in the whole transaction, find the cost price of the two watches. [SJIB (MTO) 11, SIBL (PO) 17, NRBC BANK (MTO) 18]

Tk. 360 and Tk. 480

19. A Dishonest merchant makes a 10% profit at the time of Buying and a 5% loss at the time of selling the goods he/she trades. By doing so it the said merchant made a profit of Tk. 900 on a particular item, what was the real cost of item sold? [Bank Asia (MTO) 15]

Tk. 2,000

20. A man bought a horse and a carriage for TK 3000. He sold the horse at a gain of 20% and the carriage at a loss of 10%, thereby gaining 2% on the whole. Find the cost of the horse. **Tk. 1200**

21. Padma purchased 30 kg of rice at the rate of Tk 17.50 per kg and another 30 kg rice at a certain rate. He mixed the two and sold the entire quality at the rate of Tk 18.60 per kg and made 20% overall profit. At what price per kg did he purchase the lot of another 30 kg rice? **Tk. 13.50**

22. A grocer sells rice at a profit of 10% and uses weights which are 20% less than the market weight. The total gained earned by him will be: **37.5%**

23. A fruit seller has 24 kg of apples. He sells a part of these at a gain of 20% and the balance at a loss of 5%. If on the whole he earns a profit of 10%, the amount of apples sold at a loss is: **9.6 kg**

24. A shopkeeper sold an article offering a discount of 5% and earned a profit of 23.5%. What would have been a percentage of profit earned if no discount is offered? **30%**

25. A dishonest merchant make a 15% profit at the time of buying and a 10% loss at the time of selling the goods. By doing so if the merchant made a profit of Tk. 3500 on a particular item, what was the real cost of the goods the merchant sold? [Agrani Bank SO 17]

100,000

Lecture-7 : Interest (MCQ)

Important Vocabulary:			
শব্দ	অর্থ	শব্দ	অর্থ
Simple interest	সরল সুদ	Compound interest	চক্রবৃদ্ধি সুদ
Annually	বাৎসরিক সুদ	Principal	মূলধন
Capital/Sum	আসল/মূলধন	Invest	বিনিয়োগ করা
Deposit	বিনিয়োগ করা	Diminish	কমে যাওয়া
Yearly	বাৎসরিক	Lender	ঋণদাতা
Amount	সুদাসল	Fetched	আনয়ন করে/নিয়ে আসা
Borrow	ধার করা/ঋণ নেয়া	Semi-annually	ষান্মাসিক
lend	ঋণ দেয়া	Quarterly	ত্রৈমাসিক (৩ মাস)
Doubled	দ্বিগুণ হওয়া	Trebled	তিনগুণ

Important Terms

Principal or Sum: (মূলধন বা আসল)

The money borrowed or lent out for a certain period is called principal or the Sum. (অর্থাৎ একটি নির্দিষ্ট সময়ের জন্য যে টাকা ঋণ নেয়া বা দেয়া হয় তাকেই Principal বা আসল বা মূলধন বলে।)

Interest (সুদ):

Extra money paid for using others money is called Interest. (অর্থাৎ আসলের উপর একটি নির্দিষ্ট দিন পর যে অতিরিক্ত টাকা প্রদান করা হয় তাকেই Interest বলে।)

Interest Rate (সুদের হার):

The proportion of a loan that is charged as interest to the borrower, typically expressed as an annual percentage of the loan outstanding. (প্রতি বছরের শেষে কোন মূলধনের উপর যে অতিরিক্ত টাকা বা ১০০ টাকার উপর হিসেব করে প্রদান করা হয় তাকে Interest rate বা সুদের হার বলে।)

Simple Interest (সরল সুদ):

If the interest on a sum borrowed for a certain period is reckoned uniformly, then it is called simple Interest. (অর্থাৎ প্রতি বছর একই হারে যদি নির্দিষ্ট পরিমাণ সুদ প্রদান করা হলে তাকে simple interest বা সরল সুদ বলে।)

Compound interest (চক্রবৃদ্ধি সুদ)

Compound interest is an interest calculated on the initial principal and also on the accumulated interest of previous periods of a deposit or loan. (অর্থাৎ প্রতি বচর আসলের সুদ প্রদান করার পর সুদের উপর আবার অতিরিক্ত যে সুদ প্রদান করতে হয় তাকে Compound interest বা চক্রবৃদ্ধি সুদ বলে।)

Teacher's work | Interest Amount & Interest Rate

01. How much will you earn as interest if you deposit 1000 taka in a bank account for 2 years at 10% considering simple interest rate?

a. 1200 b. 1210 c. 200 d. 210

02. The interest charged on a loan is p dollars per $1000 for the first month and q dollars per $1000 for each month after the first month. How much interest will be charged during the first three months on a loan of 10000?

a. 10p+20q b. 30q
c. 30p d. 20p+10q

03. The simple interest on a sum of money will be Tk. 600 after 10 years. If the principal is trebled after 5 years, what will be the total interest at the end of the tenth year?

a. 600 b. 900 c. 1200 d. 1500

04. A bond gets matured in 10 years. Ram invested Tk. 42000 in this bond and received Tk. 105000 once the bond matured. If the bond was under simple interest, then what was the rate of interest per annum?

a. 10% b. 12.5% c. 15% d. 7.5%

05. If interest of Tk. 500 in 4 years and interest of Tk. 600 in 5 years collectively is Tk. 500 then what is the interest rate? [21 Based Combined Officer Cash (Written): 2024]

a. 5% b. 6% c. 10% d. 12%

06. For how many years does a person need to invest his Tk. 3000 at 7% to earn Tk 420 in simple interest?

a. 3 b. 4 c. 2 d. 5

07. If the ratio of simple interest and principal is 8 : $\frac{25}{2}$ and rate of interest is equal to the time invested then find the time of investment.

a. 12 years b. 8 years
c. 10 years d. 16 years

08. If the rate of simple interest is 12% per annum the amount that would fetch interest of Tk. 6000 per annum is –

a. Tk. 50000 b. Tk. 7200
c. Tk. 72000 d. None

09. **A man is in need of money for 120 days. He asked the banker and the banker charged Tk. 360 at 6%. What was the amount asked for?**
a. Tk. 16,000 b. Tk. 15,000
c. Tk. 18,000 d. None

10. **At simple interest of 5%, 6% and 8% for three consecutive years, the interest earned is Tk. 760. Find the principal.**
a. Tk. 4000 b. Tk. 4600
c. Tk. 3200 d. Tk. 3600

11. **Tk 800 becomes Tk 956 in 3 years at a certain rate of simple interest. If the rate of interest is increased by 4%, what amount will Tk 800 become in 3 years?**
a. 1020.80 b. 1025 c. 1052 d. None

12. **The same of principal interest of a certain amount of money would be tk 460 after 3 years from now and Tk 500 after 5 years from now. What is the total interest rate?**
a. 5% b. 12% c. 15% d. 20%

13. **What is the rate of simple interest for the first 4 years if the sum of tk. 360 becomes tk. 540 in 9 years and the rate of interest for the last 5 years is 6%?**
a. 4% b. 5% c. 3% d. 6%

14. **If the interest of Tk M at M% in 4 years is Tk M then M = ?** [Janata Bank Officer (RC): 28-06-24]
a. 25 b. 20 c. 30 d. 32

15. **A total of Tk. 1200 is deposited in two savings accounts for one year, one portion at 5% simple interest, and the rest at 7% simple interest. If Tk. 72 was earned in interest, how much was deposited at 5%?**
a. 410 b. 520 c. 600 d. 650

16. **P charges at 7% p.a. simple interest to Q and R and lends a certain sum to R and Tk 2500 to Q after 4 years, P completely receives Tk. 1120 as interest from Q and R. Find the sum lent to R?**
a. Tk. 1500 b. Tk. 3100
c. Tk. 6400 d. Tk. 900

17. **Mr. Karim deposited TK 800 in a Bank at 15% annual compound interest rate At the end of the second year, the total amount including the interest will be:**
a) 850 b) 900 c) 1025 d) 1058

18. **What will be the compound interest on a sum of Tk. 25,000 after 3 years at the rate of 12% per annum?** (Janata Bank : AEO – 2019)
a. Tk. 9,000.30 b. Tk. 9,720
c. Tk. 10,483.30 d. Tk.10, 123.20

19. **A sum fetches a simple interest of Tk. 6000 at the rate of 5% pa. in 6 years. What would be the compound interest carned at the same rate of interest and the same principal in 2 years?**
a. Tk. 2050 b. Tk. 2500
c. Tk. 2125 d. Tk. 2245

20. **What will be the difference between simple and compound interest at 10% on a sum of Tk. 1000 after 4 years?**
a. Tk. 31.90 b. Tk. 32.10
c. 44.90 d. Tk. 64.10

21. **The difference between the compound interest and the simple interest on a certain sum at 5% per annum for 2 years is Tk. 1.50. The sum is?**
a. Tk. 500 b. Tk. 400 c. Tk. 300 d. Tk. 600

22. **An amount of money is invested in a savings account for two years. It increases by Tk. 52.50 in two years, after annual compounding at the rate of 10% per year. What is the amount invested initially?** [BB-AD: 2022]
a) Tk. 400 b) Tk. 300
c) Tk. 250 d) Tk. 200

23. **Himadri bought a 1-year, Tk. 10,000 certificate of deposit that paid interest at an annual rate of 8 percent compounded semiannually. What was the total amount of interest paid on this certificate at maturity?**
a) Tk. 10,464 b) Tk. 864
c) Tk. 816 d) Tk. 800

24. **A sum of $210 was taken as a loan. This is to be paid back in two equal installments. If the rate of the interest be 10% compounded annually, then the value of each installment is:**
a) $121 b) $127 c) $210 d) $225

25. **A sum of $2,00,000.00 was taken as a loan. This is to be paid back in three equal installments. If the rate of the interest be paid compounded annually, then the value of each installment is:**
a) $1,00,000 b) $1,20,000
c) $80,000 d) Data inadequate

Illustrative Qustions

01. What will be the simple interest for 1 year and 4 months on a sum of Tk. 25800 at the rate of 14% per annum?

a. Tk. 4816 b. Tk. 2580
c. Tk. 4815 d. None

Sol. Interest of 1 year or 12 months = 14% of 25800

$= 25800 \times \frac{14}{100} = \text{Tk. } 3612$

Interest of 12+4 = 16 months $= \frac{3612 \times 16}{12}$

= Tk. 4816

02. A person borrows Tk. 5000 for 2 years at 4% P.A. simple interest. He immediately lends it to another person at $6\frac{1}{4}$% P.A. for 2 years. Find his gain in the transaction per year. (Pubali Bank. Jun. Off.-2014) & [Uttara Bank (PO)-2017, PKB (EO) 2019]

a. Tk. 112.50 b. Tk. 125
c. Tk. 150 d. Tk. 167.50

Sol. Gain in 2 yrs $= \left(5000 \times \frac{25}{4} \times \frac{2}{100}\right) - \left(\frac{5000 \times 4 \times 2}{100}\right)$

= 625 – 400 = Tk. 225

$\therefore$ Gain in 1 year $= \frac{225}{2} = \text{Tk. } 112.50$

03. Bank X pays a simple interest of Taka 80 on a principal of Taka 1,000 annually. Bank Y pays a simple interest of Taka 140 on a principal of Taka 1,000 annually. What is the ratio of the interest rates of Bank X to Bank Y?

a. 4 : 7b. 6:8 c. 9:18 d. 2:4

Sol. [(a) Help: Ratio of interest rates of x to y $= \frac{80}{140} = \frac{4}{7} =$ 4:7] (since principal and time is equal)

04. At a simple interest rate of 10% per year, how many years will it take for a principal amount of Tk. 100?

a. 3 b. 2
c. $2\frac{1}{2}$ d. cannot be determined

Sol. সূত্র প্রয়োগ করে: $\frac{100 \times 100}{500 \times 10} = 2$ years.

05. A man took loan from a bank at the rate of 12% p.a. simple interest. After 3 years he had to pay Tk. 5400 interest only for the period. The principal amount borrowed by him was:

a. Tk. 20000 b. Tk. 10000
c. Tk. 2000 d. Tk. 15000

Sol. We know, I= npr $\therefore p = \frac{I}{n \times r} = \frac{5400}{12} = \text{Tk. } 15000$

06. The simple interest on a certain sum of money for $2\frac{1}{2}$ years at 12% per annum is Tk. 40 less than the simple interest on the same sum for $3\frac{1}{2}$ years at 10% per annum. Find the sum.

a. 700 b. 400 c. 800 d. 100

Sol. Let the sum be = Tk. x

ATQ, [(10% of x) × 3.5] – [(12% of x) × 2.5] = 40

$\Rightarrow \left(\frac{10x}{100} \times 3.5\right) - \left(\frac{12x}{100} \times 2.5\right) = 40$

$\Rightarrow 0.35x - x - 0.3x = 40$

$\therefore x = 800$ Tk.

07. A bank pays simple interest rate of 8% on investment. If you invest Taka 5,000 in the bank, how much money would you get after 8 years?

a. 9,255 b. 3,200 c. 5,320 d. 8,200

Sol. Total interest $= \frac{5000 \times 8 \times 8}{100} = 3200$

So, Total money that he will get is (Investment + interest)

= 5000+3200 = 8200 Tk. **Ans:**

08. If Tk. 64 amounts to Tk. 83.20 in 2 years, what will Tk. 86 amount to in 4 years at the same rate percent per annum?

a. Tk. 114.80 b. Tk. 124.70
c. Tk. 127.40 d. Tk. 137.60

Sol. Interest for 2 years = 83.20–64 = 19.20 Tk.

So, 1 year interest is 19. 2÷2 = 9.6tk

Interest rate is $\frac{9.6 \times 100}{64} = 15\%$

Therefore; interest of 86 tk for 4 years is =

$86 \times 15\% \times 4 = \frac{86 \times 15 \times 4}{100} = 51.6$ Tk.

So, Amount will be = 86+51.6 = 137.6 Tk.

09. An amount of money at simple interest amounts to Tk. 815 in 3 years and to Tk. 854 in 4 years. The amount is –

a. 689 b. 690 c. 675 d. 650

Sol. S.I. for 1 year = Tk. (854–815) = Tk. 39

S.I. for 3 years = Tk. (39×3) = Tk. 117

Principal = Tk. (815–117) = Tk. 698

10. In what time will the simple interest on Tk. 400 at 10% per annum be the same as the simple interest on Tk. 1000 for 4 years at 4% per annum?

a. 3 years b. 4 years c. 5 years d. 6 years

Sol. Let the time be = n years.

ATQ, $400 \times n = 1000 \times \frac{4}{100} \times 4$

$\Rightarrow 40n = 160 \quad \therefore n = 4$ years

11. A man saves Tk. 200 at the end of each year and lends the money at 5% compound interest. How much will it become at the end of 3 years?

a. Tk. 565.25 b. Tk. 635
c. 662.02 d. 666.50

Sol. প্রথম বছর শেষে আসল + সুদ = ২০০ + (২০০ এর ৫%) = ২১০ টাকা।
২য় বছর সঞ্চয় ২০০ এবং আগের ২১০ = ৪১০ টাকার সুদ = ৪১০ এর ৫%=২০.৫ টাকা। মোট ৪১০+২০.৫ = ৪৩০.৫
৩য় বছরে সঞ্চয় ২০০ এবং আগের ৪৩০.৫ = ৬৩০.৫ এর সুদ = ৩১.৫২৫
সুতরাং ৩ বছর পর মোট টাকার পরিমাণ: ৬৩০.৫+৩১.৫২= ৬৬২.০২৫= ৬৬২.০২

12. If the compound interest of a certain sum of money for two successive years be Tk. 225 and Tk. 238.50. What is the rate of interest per annum?

a. 5% b. 7% c. 10% d. 6%

Sol. Let, the principal for the first year is P,
Then the principal for the later year is (P+225)
Again, let, the rate of interest is x% then,
ATQ,
(P+225) × x%–P×x% = 238.50–225[২য় বছরের সু-প্রথম বছরের সু=উভয় সুদের পার্থক্য]

$$\Rightarrow \frac{Px}{100} + \frac{225x}{100} - \frac{Px}{100} = 13.5 \Rightarrow x = 13.5 \times \frac{100}{225}$$

$\therefore x=6$ **Ans: 6%**

13. If C. I on a certain sum for 2 years at 12% per annum is Tk. 1590. What would be S.I?

a. 1200 b. 1500 c. 1450 d. 1365

Sol. If P = x then (112% of 112% of x–x)
= 1590 then x=6250 (principal)
Now S.I is (12% of 6250)×2 = 1500tk]

Home Practice

01. The simple interest one sum of money at 8% per annum for 6 years is half the sum. The sum is- [21 Based Combined Officer General: 2024]

a) Tk. 4800 b) Tk. 6000
c) Tk. 8000 d) Data is inadequate

02. Tk. 6000 becomes Tk. 7200 in 4 years at a certain rate of simple interest. If the rate becomes 1.5 times of itself, the amount of same principal is 5 years will be- [BB-AD: 20-10-23]

a) Tk. 8000 b) Tk. 8250
c) Tk. 9000 d) Tk. 9250

03. An amount of money is invested in a savings account for two years. It increases by Tk. 52.50 in two years, after annual compounding at the rate of 10% per year. What is the amount invested initially? [BB-AD: 28-10-22]

a) Tk. 400 b) Tk. 300
c) Tk. 250 d) Tk. 200

04. Mr. X had Tk. 1000 in his savings account. Every month in the first week he needs money, so he withdraws Tk. 500 But by the end of the month, he deposits Tk. 750. After how many months, the original amount will grow three times? [BB-AD: 28-10-22]

a) 6 months b) 7 months
c) 8 months d) 9 months

05. What is the difference between the amount of interest earned on a principal of Tk. 100 for 2 years at 10% simple interest rate and 10% compounding interest rate? [21 Based Combined SO: 10-11-23]

a) Tk. 121 b) Tk. 120
c) Tk. 2 d) Tk. 1

06. A man needs money for 120 days. He asked the banker for a loan and the banker charged Tk. 360 @ 6% per annum. What is the amount of loan? [20 Based Combined SO: 20-01-2023]

a) Tk.15000 b) Tk. 16000
c) Tk. 18000 d) None of these

07. If a deposit of Tk 750 earns simple interest at 8% per annum and that of Tk. 1250 earns the same at 6% per annum, what is the average rate of interest (in %) earned on the total deposit? [BDB Ltd, Seni Offi-2011]

a. 5.33 b. 5.67 c. 6.75 d. 7.5

08. A person deposited Tk. 400 for 2 years, Tk. 550 for 4 years and tk. 1200 for 6 years. He received the total simple interest of Tk. 1020. The rate of interest per annum is- [BD House Building (officer)-2017]

a. 15% b. 10% c. 5% d. 20%

09. The simple interest of a certain sum of money at the rate of 5% p.a for 8 years is Tk. 840. At what rate of interest the same amount of interest can be received on the same sum after 5 years? [Pubali Bank (TAT)-2017]

a. 6% b. 8% c. 9% d. 10%

10. At a simple interest rate of 10% per year, how many years will it take for a principal amount of Tk. 500 to earn an interest amount of Tk. 100? [Uttara Bank Ltd. Ass, Offi (Cash)-2011]

a) 3 b) 2
c) $2\frac{1}{2}$ d) Cannot be determined

11. In how many years an amount of money will treble itself at a simple rate of interest of 20% per annum? [BDBL, Seni Offi 2011]

a. 8 b. 10 c. 12 d. 15

12. **In what time period will simple interest on Tk. 500 at 5% be equal to the interest on Tk. 400 for 5 years at 5%?** [Agrani Bank-(SO) 2017 (morning)-canceled]
a. 8 years b. 6 years
c. 4 years d. 3 years

13. **An amount of money becomes Tk. 1,860 at an interest rate of 8% in 3 years. How many years the money would take to become Tk. 2040 at the same interest rate?** [Agrani Bank Ltd. Seni Offi-2010]
a. $4\frac{1}{2}$ b. 5 c. 6 d. $7\frac{1}{2}$

14. **In 4 years, Tk. 6000 amounts to Tk. 8000. In what time at the same rate will Tk. 525 amount to Tk. 700?** [Uttara Bank-(Cash)-2017]
a. 2 years b. 4 years c. 3 years d. 5 years

15. **A man took loan from a bank at the rate of 12% p.a. simple interest. After 3 years he had to pay Tk. 5400 interest only for the period. The principal amount borrowed by him was:** [Janata Bank-(AEO)-2019]
a) Tk. 20000 b) Tk. 10000
c) Tk. 2000 d) Tk. 15000

16. **A man loses Tk. 55.50 yearly when the annual rate of interest falls form 11.5% to 10%. His capital is:** [Pubali Bank Ltd. (SO) 2013]
a. 3700 b. 7400 c. 8325 d. 1110

17. **A sum was put at simple interest at a certain rate for 3 years. Had it been put at 2% higher rate, it would have fetched Tk. 360 more. Find the sum.**
a. 4000 b. 3000 c. 8000 d. 6000

18. **A person takes a loan of Tk. 200 at 5% simple Interest. He returns Tk. 100 at the end of I year. In order to clear his dues at the end of 2 years, he would pay:**
a. 110 b. 115 c. 130 d. 111

19. **A sum invested at 5% simple interest per annum in $2\frac{1}{2}$ years will grow to:**
a. 420 b. 450 c. 525 d. 167.50

20. **A sum of money at simple interest amounts to TK 2800 in 2 years and to Tk 3250 in 5 years at a rate of** [Agrani Bank-(SO)-2017]
a) 4% b) 6% c) 3% d) 5%

21. **If simple interest on a certain sum of money is Tk. 256 and the rate of interest per annum equals the number of years, then the rate of interest is –** [Al-Arafah IB TO-2013]
a. 13% b. 14% c. 16% d. 18%

22. **A sum of Tk. 1550 is lent out into two parts, one at 8% and another one at 6%. If the total annual income is Tk. 106, find the money lent at each rate.**
a) 400 % 1150 b) 650 & 900
c) 700 & 850 d) None

23. **Albert invested an amount of Tk. 8,000 in a fixed deposit scheme for 2 years at compound interest rate 5% per annum. How much amount will Albert get on maturity of the fixed deposit?** [D.B.B.L. Offi;-2012]
a. 8600 b. 8620 c. 9000 d. 8820

24. **A man deposited 1000 tk. in a bank at 10% compounded annually. If the rate increase to 15% in the second year what will be the amount after second year?** [DBBL-(MTO)-2009]
a. 1200 b. 1250 c. 1265 d. 1350

25. **A sum of money amounts to Tk. 6690 after 3 years and to Tk. 10035 after 6 years on compound interest. Find the sum.** [Rupali Bank-(SO)-2019]
a. Tk. 4360 b. Tk. 4560
c. Tk. 4660 d. 4460

26. **The compound interest on Tk. 10,000 for 4 years at 5% per annum will be approximately-**
a. 2000 b. 2025 c. 2050 d. 2155

27. **If the simple interest on a sum of money for 2 years at 5% per annum is Tk. 50, what is the compound interest on the same at the same rate and for the same time?**
a. Tk. 51.25 b. Tk. 52
c. Tk. 54.25 d. Tk. 60

28. **The simple interest received on a sum of money at the end of 10 years is two times of the principal. At the same rate of interest what would be the ratio of principal and compound interest received at the end of two years?** [Combined-4 Banks (Officer)-2019]
a. 25 : 11 b. 20 : 11 c. 20 : 9 d. None

29. **Mr. X had Tk. 1000 in his savings account. Every month in the first week he needs money, so he withdraws Tk. 500 But by the end of the month he deposits Tk. 750. After how many months, the original amount will grow three times?** [BB-AD: 2022]
a) 6 months b) 7 months
c) 8 months d) 9 months

30. **A man's investment doubles in every 5 years. If he invested Tk. 5000 in each of the years 2010, 2015, 2020, then what will be the amount received by him in 2025?** [Bangladesh Bank Officer General: 2022]
a) tk. 30,000 b) Tk. 70,000
c) Tk. 80,000 d) Tk. 1,50,000

31. **The interest charged on a loan is 'P' per Tk. 1000 for the first quarter (3 months), and 'Q' per Tk. 1000 for each month after the first quarter. How much interest will be charged for the first year on Tk. 10,000?** [BB- Officer General: 2022]
a) 10 (P +Q) b) 10 (P+9Q)
c) 4P + 9Q d) None of these

Lecture-8 : Interest (Written)

Teacher's work | Interest amount & Interest Rate

01. Mr. A depositd a certain amount of money for a fixed period of time. On maturity, he received a total of Tk. 60,000 and the ratio fo interest and investment was 3:6. If the interest rate was 6.25% (simple), calculate the time period for which the money was invested? [Officer General Written Exam 2022]

02. The simple interest on a certain sum of money for 2.5 years at 12% per annum is Tk. 40 Less than the simple interest on the same sum for 3.5 years at 10% per annum. Fin the sum.

03. Someone plans to invest x taka in the bond of 'M' Company, which pays 10% interest and y taka in 'N' Company bonds, which pay 9% interest. He will invest 9000 taka and require that he receives 850 taka as interest. How much should he invest in each company?

04. David invested certain amount in three different schemes A, B and C with the rate of interest 10% p.a., 12% p.a. and 15% p.a. respectively. If the total interest accrued in one year was Tk. 3200 and the amount invested in Scheme C was 150% of the amount invested in Scheme A and 240% of the amount invested in Scheme B, what was the amount invested in Scheme B?

05. If a person invest 4000 taka at x% and 5000 taka at y%, he will get total 320 taka as interest. On the other hand if he invest 5000 at x% and 4000 and y%, he will get total 310 taka as interest. Find the value of x and y.

06. A man divided his share between his sons A and B in such a way that the interest received by A at 15% p.a. for 3 years is double the interest received by B at 12% p.a. for 5 years. In what ratio was his share divided? [21 Based Combined Officer (Cash): 2024]

07. A man deposits Tk. 5000 at 5% annual interest for six months. In every six months he withdraws Tk. 500 from his principal plus interest earned. What is the total amount of interest he received?

Compound Interest

08. Ashik invested an amount of Tk. 8000 in a fixed deposit scheme for 2 years at compound interest rate 5%. How much amount will Ashik get on maturity of the fixed deposit?

09. A man deposits Tk. 1000 in a bank at 8% interest rate compounded annually. At the end of the 3rd year, what will be the total amount including interest?

10. Find the compound profit of Tk. 5000 at the profit of 10.50% per annum in 2 years.

11. A sum of money amounts to Tk.6690 after 3 years and to Tk. 10035 after 6 years on compound interest. Find the sum.

12. A sum of money becomes 8 times in 3 years at compound interest. How many years it will become 16 times?

13. An amount of money is invested in a savings account for two years. It increases by Tk. 420 in two years after annual compounding at the rate of 10% per year. What the amount, in taka invested initially?

14. A sum of Tk. 1260 is borrowed from a money lender at 10% p.a. compounded annually. If the amount is to be paid in two equal annual installments, find the annual installments.

15. Suppose you deposited Taka 10,000 on January 01, 2012 at 12.50% interest rate-for 1 year, on July 01, 2013 Taka 15,000 at 12% interest rate for 6 months and on October 01, 2013 Taka 20,000 at 11.50% interest rate for 3 months (assume that the stated interest rates are simple and annual). Suppose you withdrew all deposits (including due interests) on December 31, 2013. Calculate the overall annual rate of interest you have received.

Illustrative Questions | Simple Interest

01. Annie invested a certain sum of money in a bank that paid simple interest. The amount grew to Tk. 240 at the end of 2 years. She waited for another 3 years and got a final amount of Tk. 300. What was the principal amount that she invested at the beginning?

Sol. In 5 years, Principal amount + Interest = Tk. 300
In 2 years, Principal amount + Interest = Tk. 240
[By Subtracting] In 3 years, interest = Tk. 60

$\therefore$ In 2 years interest = Tk. $\frac{60\times2}{3}$ = Tk. 40

So, initial amount = Tk. (240-40) = Tk. 200 **(Ans)**

02. A certain sum of money amounts to Tk. 1008 in 2 years and to Tk. 1164 in $3\frac{1}{2}$ years. Find the sum and rate of interests.

Sol. In $3\frac{1}{2}$ years, Principal amount + Interest = Tk. 1264

In 2 years, Principal amount + Interest = Tk. 1008

[By Subtracting] In $1\frac{1}{2}$ = 1.5 years interest = Tk. 156

$\therefore$ In 2 years interest = Tk. $\frac{156\times2}{1.5}$ = Tk. 208

So, Principal amount = Tk. (1008-208) = Tk. 800

Here, time, n=2 years, Interest, I=Tk. 208 and Principal, P = Tk. 800.

We know, $I = \frac{pnr}{100}$

$\therefore r = \frac{100I}{pn} = \frac{100\times208}{800\times2} = 13$

$\therefore$ Rate of interest = 13%. (Ans)

03. What will be the deposited amount at initial stage, if it becomes Tk. 43750 at the end of 5 year with a simple interest rate of 15% per annum? How many years it will take said deposited amount to become Tk. 5500?

Sol. Let, Principal = P

We know,

I = A-P = Pnr [সুদ = সুদাসল-আসল]

Or, 43750-P = P×5×15%

Or, 43750 = P+0, 75P

Or, 1.75 P = 43750

$\therefore$ P = 25000

Deposited amount = Tk. 25,000.

Here, P = 25000, A = 55000, r = 15% and n =?

Again,

A–P = Pnr

Or, 55,000-25,000 = 25,000×000×n×15%

Or, 30,000 = 3750n

$\therefore$n = 8 years

$\therefore$ Time = 8 years.

Ans: Tk. 25000 and 8 years

04. সজল ৬% ও ৭% হারে সরল সুদে দুইটি ভিন্ন অংশে বিনিয়োগ করে ২ বছর পরে মোট ৩৫৪ টাকা সুদ পায়। যদি বিনিয়োগের ১ম অংশের এক-চতুর্থাংশ ২য় অংশের এক-পঞ্চমাংশের সমান হয় তবে দুই অংশের বিনিয়োগের যোগফল কত?

(Mr. Shajol in invested his capital in two parts, one at 6% & another at 7%. At the end of 2 years he received Tk. 354 as interest at all. If one-fourth of 1st part of investment equals to one-fifth of 2nd pat of investment, then what was his total investment?)

Sol. Let, first part of the investment be Tk. x and second part be Tk. y.

According to the question,

$\frac{1}{4}$ of x = $\frac{1}{5}$ of y

Or, $\frac{x}{4} = \frac{y}{5}$ Or, 4y = 5x $\therefore y = \frac{5x}{4}$

Now,

P1n1r1 + P2n2r2 = Total interest

Or, x × 2 × 6% + y × 2 ×7% = 354]

Or, $\frac{12x}{100} + \frac{14y}{100} = 354$

Or, 12x + 14y = 354×100 [Multiplying both sides by 100]

Or, $12x + 14\times\frac{4x}{4} = 35400$

Or, $\frac{48x+70x}{4} = 35400$

Or, $\frac{118x}{4} = 35400$

Or, $x = 35400 \times \frac{4}{118}$ $\therefore$ x = 1200

$\therefore y = \frac{5\times1200}{4} = 1500$

$\therefore$ First part of the investment was Tk. 1200 and second part was Tk. 1500.

$\therefore$ Total investment = Tk. (1200+1500)

= Tk. 2700 (Ans.)

05. A novelist earned Tk. 100,000 from royalties on her book. She paid 20% income tax on the royalties. She invested Tk. 50,000 at one rate and the rest at a rate that was 1% lower, earning 6,100 taka annual interest on the two investments. What was the lower rate?

Sol. After paying tax, remaining amount = Tk. (100,000-20% of 100,000) = Tk. 80,000

Let, she invest Tk. 50000 at x5 interest and another Tk. 30,000 at (x-1)% interest.

According to the question,

X% of 50,000 + (x-1)% of 30,000=6100

Or, 500x + 300)x-1) = 6100

Or, 500x + 300x–300 = 6100

Or, 800x = 6400

So, lower interest rate = (8-1)% = 7% **(Ans.)**

06. Mr. B invests Tk. 2400 at 5% interest annually. How much additional money needs to invest at 8% interest to earn overall interest at 6% on entire amount?

Sol. Let, additional amount be Tk. p

According to the question,

5% of 2400+8% of x = 6% of (2400+x)

Or, $\frac{5}{100}\times24{,}000 + \frac{8}{100}\times x = \frac{6}{100}\times(24{,}000+x)$

Or, 5×2400+8x = 6(2400+x) [Multiplying by 100]

Or, 12,000 + 8x = 14400 + 6x

Or, 8x-6x=14400-12,000

Or, 2x = 2400

$\therefore x = \frac{2400}{2} = 1200$

$\therefore$ Additional amount= Tk. 1200. (Ans.)

07. A man borrows Tk. 2500 at 4% p.a. and Tk. 1800 at 5% simple interest for the same period. If he pays Tk. 570 as total interest, fid the time for which the sums were borrowed.

Sol. Let, the time period be x years.
According to the question,
$2500 \times x \times 4\% + 1800 \times x \times 5\% = 570$
Or, $2500 \times x \times \frac{4}{100} + 1800 \times x \times \frac{5}{100} = 570$
$100x + 90x = 570$
Or, $190x = 570$
$\therefore x = 3$ **(Ans: 3 years)**

08. Two equal amount of money are deposited in two banks, each at 15% per annum, for 3.5 years and 5 years. If difference between their profits is Tk. 144, what is the each amount of money deposited?

Sol. Let, initial deposit be Tk. 100x
According to the question,
$(100x \times 15\% \times 5) - 100x \times 15\% \times 3.5) = 144$ [Here, Interest (I) = Prn]
Or, $22.5x = 144$
$\therefore 100x = \frac{144 \times 100}{22.5} = 640$
$\therefore$ Initial deposit = Tk. 640. **(Ans.)**

09. Two banks offer interest rate of 6% and 7% respectively, on fixed Deposit. Mr. Rahman deposited a total amount of Tk. 4000 in the banks and in one year his interest income was Tk. 250. How much money was deposited in the bank with 7% interest?

Sol. Let, he invested Tk. x at 7% and Tk. (4000–x) at 6% interest respectively
According to the question,
7% of x+6% of (4000-x) = 250
Or, 7x + 24000-6x = 25000 [Multiplying both sides by 100]
Or, 7x-6x = 25000-24000
$\therefore x = 1000$
$\therefore$ Tk. 1000 invested at 7% interest. **(Ans.)**

10. Mr. Amin invests Tk. 2400 at 7.55 interest annually. How much additional money needs to invest at 10% interest to earn overall interest at 9.25% on entire amount?

Sol. Let, Sakib borrowed Tk. x and Labib borrowed Tk. y.
According to the question,
Sakib's (Principal + Interest) = Labib's (Principal + Interest)
$X+x \times x \times 3 \times 20\% = y+y \times 2 \times 20\%$
Or, $x+x \times x \times 3 \frac{20}{100} = y+y \times 2 \times \frac{20}{100}$
Or, $x+\frac{3x}{5} = y+\frac{2y}{5}$ Or, $\frac{5x+3x}{5} = \frac{5y+2y}{5}$
Or, $8x = 7y$ [Multiplying both sides by 5]
Or, $\frac{x}{y} = \frac{7}{8}$ $\therefore$ Required ratio = 7:8. **(Ans.)**

Illustrative Question | Compound Interest

11. If the simple interest on a sum of money at 5% per annum for 3 years is Tk. 1200, find the compound interest on the same sum for the same period at the same period at the same rate.

Sol. Rate of interest, r = 5%, Time, n = 3 years, S.I = Tk. 1200.
$\text{Principal} = \frac{100I}{nr} = \frac{100 \times 1200}{3 \times 5} = \text{Tk. } 8000$
Compound Amount = $8000 (1+\frac{5}{100})^3$ = Tk. 9261.
$\therefore$ Compound Interest = Tk. (9261-8000)
= Tk. 1261. (Ans)

12. A man deposits Tk. 1000 in a bank at 10% interest rate compound annually for the first year. The rate increases to 15% in the second year. At the end of the second year, the total amount including interest will become how much?

Total amount after first year = 1000+10% of 1000 = Tk. 1100
Total amount after second year = 1100+15% of 1100 = Tk. 1265 (Ans.)

13. A sum of money is borrowed and paid back in two annual installments of Tk. 882 each allowing 5% compound interest. The sum borrowed was:

Sol. At the second year,
$\text{paid} = \text{Tk. } \frac{882}{105\%} = \text{Tk. } \frac{882 \times 100}{105} = \text{Tk. } 840$
At the first year,
$\text{paid} = \text{Tk. } \frac{840}{105\%} = \text{Tk. } \frac{840 \times 100}{105} = \text{Tk. } 800$
$\therefore$ The sum borrowed = Tk. (840+800)
= Tk. 1640 (Ans)

14. Compound interest on a certain sum for 2 years at 10% per annum is Tk. 420. What would be the simple interest at the same rate and for the same time?

Sol. Let, principal be Tk. P
Compound Interest,
$P(1 + r\%)2-P = 420$
Or, $P (1+10\%)2-P = 420$
Or, $1.21 P-P = 420$
Or, $0.21P = 420$ $\therefore P = 2000$
$\therefore$ Simple interest = $2000 \times 2 \times 10\%$ = Tk. 400 (Ans.)

15. A sum of money invested at compound interest amounts to Tk. 4624 in 2 years and Tk. 4913 in 3 years. The sum of money is:

Sol. In 1 year, simple interest = Tk. (4913-4624) = Tk. 289
$\therefore$ Rate of interest = $\frac{25}{4}$ %
Again, $C=P (1+r\%)^n$
$4626 = P \left(1+\frac{25}{4}\%\right)^2 = P \left(1+\frac{25}{4} \times \frac{1}{100}\%\right)^2 = P \left(1+\frac{1}{16}\right) = P \left(\frac{1}{16}\right)^2$
$P = 4624 \times \frac{16}{17} \times \frac{16}{17}$ = Tk. 4096 (Ans).

14. Alam invested an amount of Tk. 13900 divided in two different deposits at Bank X and Bank Y at the simple interest rate of 14 percent and 11 percent per annum, respectively. If the total amount of simple interest earned in two years is Tk. 3058, what was the amount invested in the deposit of Bank Y?
Tk. 13900

15. A sum invested at 5% simple interest per annum grows to Tk. 504 in 4 years. The same amount at 10% simple interest per annum in 2.5 years will grow to?
Tk. 525

16. For how much money will the profit at the rate of Tk. 5 per annum in 2 years 6 months be same as that of Tk. 500 at the rate of Tk. 6 per annum in 4 years?
Tk. 960

17. Two equal sums of money are lent at the same time at 8% and 7% per annum simple interest. The former is recovered 6 months earlier than the latter and the amount in each case is Tk. 2560. The sum and the time for which the sums of money are lent out are.
The sum is Tk. 2000 and time periods are $3\frac{1}{2}$ years and 4 years.

18. Interest rate in 1996 was increased by 10% of that of previous year. In 1997 it was decreased by 10% of that of the previous year. Compared to 1995, what is the interest rate in 1997?
The interest rate decresed by 1%

19. The interest on a certain deposit at 4.5% p.a. is Tk. 202.50 in one year. How much will the additional interest in one year be on the same deposit at 5% p.a.?
Tk. 22.50

20. The profit-principal for a certain period of time is Tk. 5600 and the profit is $\frac{2}{5}$ of the principal. If the percentage of profit is Tk. 8, find the time.
Time = 5 years

21. Profit-principal of some principal becomes Tk. 5500 in 3 years and profit is $\frac{3}{8}$ of the principal. What are the principal and rate of profit?
12.5%

Home Practice | Compound Interest

01. A sum fetches a simple interest of Tk. 6000 at the rate of 5% p.a. in 6 years. What would be the compound interest earned at the same rate of interest and the same principal in 2 years? **Tk. 2050**

02. The difference in taka between simple and compound interest at 5% annually on a sum of Tk. 2000 after 2 years is-
Tk. 5

03. Find the compound interest on Tk. 10,000 in 2 years at 4% per annum, the interest being compounded half-yearly.
Tk. 824.32

04. The difference between simple & compound interest annually on same amount at 8% for 2 years is Taka 12.80, what is the principal amount?
Tk. 2000

05. An amount of Tk. 20736 in 2 years. If the rate of interest is compounded half yearly, what is the annual rate of interest?
40%

06. Amit deposited some money in a bank, which pays 15% interest per annum compounded yearly. If the bank provides simple interest instead of compound interest, he receives Tk. 2400 after 2 years. Find the total amount that he received after 2 years. **Tk. 10580**

07. A person borrows Tk. 5000 from a lending organization at the rate of 8% compound profit. At the end of every year he paid off Tk. 2000. After paying off the 2nd installment, how much more money will he have as loan?
Tk. 1672

08. The different between simple and compound interests compounded annually on certain sum of money for 2 years at 4% per annum is Tk. 1. The sum is?
Tk. 625

09. The difference between the compound interest and simple interest on a certain sum at 10% per annum for 2 years is Tk. 631. Find the sum.
Tk. 63,100

10. If the compound interest on a certain sum at $16\frac{2}{3}$% to 3 years is Tk. 1270, find the simple interest on the same sum at the same rate and for the same period.
Tk. 1080

11. If Tk. 500 amounts to Tk. 583.20 in two years compounded annually, find the rate of interest per annum.
8%

12. Find compound interest on Tk. 8000 at 15% per annum for 2 years 4 months, compounded annually.
Tk. 3109

13. How much interest will Tk. 2000 earn at annual rate of 8%. In one year if the interest is compounded every 6 months?
Tk. 163.2

14. The difference in taka between simple and compound interest at 5% annually on a sum of Tk. 5000 after 2 years is–
Tk. 12.5

15. There is 60% increase in an amount in 6 years at imple interest. What will be the compound interest of Tk. 12000 after 3 years at the same rate? **Tk. 3972**

16. At the same rate of profit, if the compound principal of any amount of principal at the end of one year is Tk. 6500 and at the end of two years is Tk. 6760, what was the principal?
Tk. 6250

17. If the rate of profit is Tk. 10 percent per annum, what will be the difference of simple profit and compound profit of Tk. 5000 in 3 years?
Tk. 155

18. A sum of money placed at compound interest double itself in 4 years. In how many years will it amount to four times itself?
8 years