01. A man deposits 5000 tk. 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?

02. 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

03. A man invested some money in a bank at simple interest. He got 240 Tk at the end of 2 years. Another 3 years later he got the final amount 300 Tk. What amount of principal he invested in the bank?

04: A lamp is manufactured to sell for tk. 35 which yields a profit of 25% of cost. If the profit is to be reduced to 15% of cost, what will be the new retail price of the lamp?

05. A man deposits 5000 tk. 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?

06. Salam used a part of TK 100,000 to purchase a TV of the remaining portion he invested 1/3 of it at 4% simple annual interest and 2.3 of it at 6% simple annual interest, If after a year the income from two investment totaled Tk 320. What was the purchase price of the TV?

07. A man borrows tk 500 at 5% interest. After some years he again borrow 400 at 3.5% interest. Then after 6 month he paid borrowed amount along with interest totaling 994.5 taka. After how many years of his first borrowing he paid his borrowings and interest

08. A person earns yearly interest of Tk. 920 by investing Tk. x at 4% and Tk. Y at 5% simple interest rate. If he had invested Tk. X at 5% and Tk. Y at 4% simple interest rate, then his yearly interest earning would have been reduced by Tk. 40. Find out the amount of X and Y.
According to the question,

09. What will be the deposited amount at initial stage, if it becomes Tk. 43,750 at the end of 5 years with a simple interest rate of 15% per annum? How many years it will take the said deposited amount to become Tk. 55,000?

10. A depositor deposited Tk. 4,000 at x% simple interest and Tk. 5,000 at y% simple interest. He received annual interest of Tk. 320 on his deposited amounts at the year end. If he could deposit Tk. 5,000 at x% simple interest and Tk. 4,000 at y% simple interest, he would receive annual interest of Tk. 310. Find the value of x and y.

11. 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.

12. If the sum of interests on Tk. 500 in 4 years and Tk. 600 in 5 years is Tk. 500 then what will be the interest on Tk. 1000 in 3 years?

13. A certain sum of money amounts to Tk. 1,008 in 2 years and to Tk. 1,164 in $3\frac{1}{2}$ years. Find the sum and the rate of interest.

14. Simple interest rate of a bank was reduced to 5% from 7%. As a consequence, Karim's income from bank interest was reduced by Tk. 2100 in 5 years. How much was Mr. Karim's initial deposit with the bank?

15. A sum of Tk. 5,500 is divided into two parts and invested at 4% p.a. for 3 years and at 5% p.a for 6 years respectively. If interest earned on the second part is three times of that on the first part, find the amount invested in second part.

16. Tk. 1500 is invested at a rate of 10% simple interest and interest is added to the principal after every 5 years. In how many years will it amount to Tk. 2,500?

17. A pension fund has a total of Tk. 1 million investments in Bangladesh Biman bond and DEF Corporation's debenture. The Bangladesh Biman Bond yields 12% in cash each year, and the DEF debenture pays 10% in cash each year. The pension fund received a total of Tk. 115,000 in cash from Bangladesh Biman bond and DEF debenture last year. How much money was invested in Bangladesh Biman bond?

18. A father divides his property between his two sons A and B. A invests the amount at compound profit of 8% p.a. B invests the amount at 10% p.a. simple profit. At the end of 2 years, the profit received by B is Tk. 1336 more than the profit received by A. Find the share of A in the father's property of Tk. 25,000.

19. 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 installment?

20. Mr. Rafiq has an invested amount of Tk. 1, 00,000. He will invest the amount for two years. He has two options. He can invest at a simple interest rate of 12% per year. Alternatively, he can invest at an rate of 10% compounded semi-annually. Calculate his earnings under the two options and advice Mr. Rafiq accordingly.

21. A borrower pays 8% interest per year on the first Taka 600 he borrows and 7% per year on the part of the loan in excess of Taka 600. How much interest will the borrower pay on a loan of Taka 6,000 for one year?

22. Mr. Rahim invested Tk. 50,00,000 at an interest rate of 12% per annum and Tk. 80,00,000 at an interest rate of 15% per annum for one year. If he has no other source of income then what is his income after one year? If the rate of income tax is 10% on interest income, what is the amount of income tax he has to pay?

23. Mr. X invests Tk. 2400 in the bank at 5% interest. How much additional money must be invested at 8% interest so that the total interest will be equal to 6% of his entire investment?

24. A sum of Tk. 5,500 is divided into two parts and invested at 4%p.a. for 3 years and at 5% p.a for 6 years respectively. If interest earned on the second part is three times of that on the first part, find the amount invested in second part.

25. Selim deposited a total of Tk. 1,20,000 in two savings accounts for one year. One account offered him 8% interest and the other 10%. If he earned Tk. 10,000 as interest after one year, how much did he deposit at the account offering 8% interest?

26. 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.

27. Mr. Rafiq has an invested amount of Tk. 1, 00,000. He will invest the amount for two years. He has two options. He can invest at a simple interest rate of 12% per year. Alternatively, he can invest at an rate of 10% compounded semi-annually. Calculate his earnings under the two options and advice Mr. Rafiq accordingly.

Chapter — Partnership

28. A, B and C inter into partnership. A invests 3 times as much as B invests and B invests two-third of what C invests. At the end of the year, the profit earned is Tk. 6600. What is the share of B?

29. Shakil started a business investing Tk. 25000 in 2009. In 2010, he invested an additional amount of Tk. 10000 and Raihan joined him with an amount of Tk. 35000. In 2011, Shakil invested another additional amount of Tk.

10000 and Jafor joined them with an amount of Tk. 35000. What will be Raihan's share in the profit of Tk. 150000 earned at the end of 3 years from the start of the business in 2009?

30. A, B and C start business each investing Tk. 20,000. After 5 months A withdrew Tk. 5000, B withdrew Tk. 4000 and C invests Tk. 6000 more. At the end of the year, a total profit of Tk. 69,900 was recorded. Find the share of each.

31. A, B and C enter into a partnership by investing in the ratio of 3 : 2 : 4. After one year, B invests another Tk. 2,70,000 and C, at the end of 2 years, also invests Tk. 2,70,000. At the end of three years, profits are shared in the ratio of 3 : 4 : 5. Find the initial investment of each.

32. Two partners A and B have 70% and 30% shares respectively in a business. After sometimes, a third partner C joined the business by investing Tk. 10 lakh and thus having 20% share in the business. What percentage is the A's share now in the business?

33. Three partners A, B & C start a business. Twice the investment of A is equal to thrice the capital of B is 4 times the capital of C. They share the profit in the ratio of their capital. In a particular year, the gross profit is Tk. 250000 and the administrative expenses are 20 % of the gross profit. Find the share of profit each partner.

34. A. B and C started a business by investing Tk.1,20,000, Tk.1,35,000 and Tk.1,50,000 respectively. Find the share of each, out of an annual profit of Tk.56,700.

35. A, B, and C enter into a partnership in the ratio $\frac{7}{2}:\frac{4}{3}:\frac{6}{5}$. After 4 Months, A increase his share by 50%. If the total profit at the end of one year is Tk. 21,600, then what is B's share in the profit?

36. A, B and C jointly thought of engaging themselves in a business venture. It was agreed that A would invest Tk. 6500 for 6 months, B, Tk. 8400 for 5 months and C, Tk. 10,000 for 3 months. A wants to be the working member for which, he was to receive 5% of the profits. The profit earned was Tk. 7400. Calculate the share of B in the profit.

37. A starts business with Tk. 3500 and after 5 months, B joins with A as his partner. After a year, the profit is divided in the ratio 2 : 3. What is B's contribution in the capital?

38. Three partners A, B, C start a business. Twice the capital of A is equal to thrice the capital of B and the capital of B is 4 times the capital of C. Find the share of profit of B if the total amount of profit is equal to 2,97,000.

39. Polash started a business on the first day of 2008. Qader joined the business of Polash on partnership contract with double investment of Polash on July 1 of 2008. Sohel, on the first day of September 2008, joined the partnership business of Polash and Qader with thrice the investment of Polash. The firm earned a profit of Tk. 72,000 on 31st December, 2008. How much will Sohel receive as profit?

40. Ripon, Liton and Pintu started a business jointly with a total amount of Taka 280. Ripon paid Taka 45 more than Liton and Liton paid Taka 70 less than Pintu. If the company made a profit of Taka 56, how much profit should Liton receive?

41. A & B invest in a business in the ratio 3 : 2. If 5% of the total profit goes to charity and A's share is Tk. 855, total profit is:

42. A, B & C enter into partnership by investing in the ratio 3: 5: 7. After a year, C invests another Tk. 337600 while A withdrew Tk 45600. The ratio of investments then changes to 24: 59: 167. How much did A invest initially?

Chapter — Ratio-proportion and Mixture

43. In a mixture the ratio of apples, peaches and grapes is 6:5:2. If the total mixture is 39 pounds then what is the difference between apples and grapes?

44. A drink contains 20% of mango juice, 20% of guava juice and the rest is the apple juice. A man added 250 ml water to 750 ml of the drink. Now, what is the ratio of water to apple juice in the drink?

45. Rahim bought two varieties of rice, costing Taka 5 per kg and Taka 6 per kg each, and mixed them in some ratio. Then he sold the mixture at Taka 7 per kg, making a profit of 20 percent. What was the ratio of the mixture?

46. A certain college has students to teacher ratio of 11 to 1. The average annual salary for teachers is Tk. 26,000. If the college pays a total of Tk. 33,80,000 in annual salaries to its teachers, how many students does the college have?

47. A bag contains tomatoes that are either green of red. The ratio of green tomatoes to red tomatoes in the bag is 4 to 3. When five green tomatoes and five red tomatoes are removed, the ratio 3 to 2. How many red tomatoes were there originally in the bag?

48. Mr. Zaman won an election where the ratio of his votes and those of his opponent, Mr. Yunus, was 4 : 3. The total number of voters was 581, of which 91 did not vote. Calculate the margin of votes by which Mr. Yunus was defeated?

49. The salaries A, B, C are in the ratio 2 : 3 : 5. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be new ratio of their salaries?

50. Two equal glasses are respectively $\frac{1}{3}$ and $\frac{1}{4}$ full of milk. They are then filled up with water and the contents mixed in a tumbler. What is the ratio of milk and water in the tumbler?

51. The ratio of milk and water in 85 kg of adulterated milk is 27:7. The amount of water which must be added to make the ratio 3:1 is:

52. 94 is divided into two parts in such a way that fifth part of the first and eighth part of the second are in the ratio 3:4. The first part is:

53. In a class, the number of boys is more than the number of girls by 12% of the total students. The ratio of boys to girls.

Students' Work — Solution

01: Since interest rate is semi-annual, so interest rate= 5%/2 = 2.5%
Total Interest= 2.5% * 5000 + 2.5%*4500 + 2.5%*4000 + 2.5%*3500 + 2.5%*3000 + 2.5%*2500 + 2.5%* 2000 + 2.5%*1500 + 2.5%*1000 + 2.5%*500
= 2.5%*27500 = 687.5 Tk. **(Ans.)**

02 : Total interest in 10 years = 600 tk.

Interest in 5 years = 600/2 = 300 tk.
We know that, after 5 years when principal becomes trebled interest also be trebled
So next 5 years interest = Tk. (300 × 3) = Tk.900
Total interest after 10 years = Tk. (300 + 900) = Tk.1200 **(Ans.)**

03: Interest added after 3 years = 300 – 240 = 60 Tk
Therefore, interest in 1 year = 60/3 = 20 Tk
Hence Interest in 2 years = 2 × 20 = 40
Principal = 240 – 40 = 200 Tk. **(Ans.)**

04: Given that, selling price = tk 35
At 25% profit, cost price = 35 × 100/125 = 28 tk
At 15% profit,when cost price 100 tk selling price = 115 tk
When cost price 28 tk selling price = 115 × 28/100 = 32.20 tk **(Ans.)**

05: Since interest rate is semi-annual, so interest rate = 5%/2 = 2.5%
Total Interest = 2.5% * 5000 + 2.5% * 4500 + 2.5% * 4000 + 2.5% * 3500 + 2.5% * 3000 + 2.5% * 2500 + 2.5% * 2000 + 2.5% * 1500 + 2.5% * 1000 + 2.5% * 500
= 2.5% * 27500 = 687.5 Tk. **(Ans.)**

06: Let, the purchase price of the TV = tk x
And remaining amount of money = tk(100,000 – x)
According to the question, (100,000 – x) * 1/3 *4% + (100,000 – x) * 2/3 * 6% = 320
Or, 1000/3 * 4 + 12000/3 – 4x/300 – 12x/300 = 320
Or, 4000/3 + 12000/3 – 4x/300 –12x/300 = 320;
Or, 400000 + 1200000 – 4x –12x = 320 * 300
Or, 16x = 1600000 – 96000 Or, 16x = 1504000
Or, x = 94,000 **(Ans.)**

07: Total interest = 994.5 – (500 + 400) = 94.5
Let, his first borrowing paid after x years
We know, I = Prn [I = interest amount, P = principal amount, r = interest rate, n = no. of years]
ATQ,
500 * 5% * x + 400 * .3.5 * 6/12 = 94.5
X = 3.5 **(Ans.)**

08. 4% of x + 5% of y = 920 ..... (i)
5% of x + 4% of y = 920 – 40 = 880..... (ii)
(i) + (ii) $\Rightarrow$ 9% of x + 9% of y = 1800

$\Rightarrow 9\%\,(x+y) = 1800 \Rightarrow \frac{9}{100}(x+y) = 1800 \Rightarrow x+y = \frac{1800\times100}{9} = 20{,}000$

Now, putting $x = (20{,}000 - y)$ in the 1st equation :

$.04\,(20{,}000 - y) + .05y = 920$ [4% = .04 and 5% = .05]

$\Rightarrow 800 - .04y + .05y = 920 \Rightarrow .01y = 920 - 800 = 120 \Rightarrow y = \frac{120}{.01} = 12000 \;\therefore x = 20000 - 12000 = 8000$

$\therefore$ x = Tk. 8000; y = Tk. 12000 (Ans)

09. Let, the amount deposited at the initial stage be = p

$\therefore$ Interest = 43750 – p

$\therefore$ we get,

$43750 - p = p \times 5 \times \frac{15}{100}$ $\Rightarrow 437500 - 100p = 75p$ $\Rightarrow 175p = 4375000$ $\Rightarrow p = \frac{4375000}{175} = 25000$

when the deposited amount become 55000, the interest is (55000-25000) = 30000 Tk

$\therefore$ the number of years needed = $\frac{30000 \times 100}{25000 \times 15}$ = 8 years **(Ans)**

10. According to the question

x % of 4000 + y% of 5000 = 320 $\Rightarrow 40x + 50y = 320$ ..... (i)

Again, we get, x % of $5000 + y\%of\ 4000 = 310$ $\Rightarrow 50x + 40y = 310$ ..... (ii)

By adding the equation i & ii we get

$90x + 90y = 630$ $\Rightarrow x + y = 7.....(iii)$

Subtracting equation (i) from (ii) we get

$10x - 10y = -10$ $\Rightarrow x - y = -1....(iv)$

By Adding the equation (iii) & (iv) we get $x + y + x - y = 7 - 1$ $\Rightarrow 2x = 6$ $\Rightarrow x = 3$

Putting the value of x in equation (iii) we get $x + y = 7$ $\Rightarrow y = 4$

$\therefore$ The value of x & y are 3 & 4 respectively. **(Ans : 3 & 4)**

11. Let, the sum be x

$\therefore$ According to the question,

$x \times 3\frac{1}{2} \times 10\% - x \times 2\frac{1}{2} \times 12\% = 40$ $\Rightarrow x \times \frac{7}{2} \times \frac{10}{100} - x \times \frac{5}{2} \times \frac{12}{100} = 40$

$\Rightarrow \frac{70x}{200} - \frac{60x}{200} = 40$ $\Rightarrow \frac{10x}{200} = 40$ $\Rightarrow x$ = 800 Tk

$\therefore$ The sum is 800 taka. **(Ans : 800)**

12. Let, Rate = r

$\therefore$ According to problem : $\frac{500 \times 4 \times r}{100} + \frac{600 \times 5 \times r}{010} = 500$

$\Rightarrow 5000r = 50000$; $\therefore r = 10\%$

$\therefore$ Now, $I = \frac{Pnr}{100} = \frac{1000 \times 3 \times 10}{100} = 300$Tk **(Ans : 300Tk)**

13. Interest of $1\frac{1}{2}$ years = 1164-1008= 156 Tk

$\therefore$ „ „ 1 „ $= \frac{156\times 2}{3} = 104$ „

$\therefore$ „ „ 2 „ $= 104\times 2 = 208$ Tk

$\therefore$ Sum of money = 1008 – 208 = 800 $\therefore$ Rate of interest = $\frac{208\times 100}{800\times 2} = 13\%$ **(Ans : 13%)**

14. Let, Mr. Karim's initiative deposit be x

$\therefore$ According to the question

$x\times 5\times 7\% - x\times 5\times 5\% = 2100 \Rightarrow \frac{35x}{100} - \frac{25x}{100} = 2100 \Rightarrow \frac{10x}{100} = 2100 \Rightarrow x$ = 21000 Tk.

Mr. Karim's initiative deposit is 21000 Tk. **(Ans)**

15. Let the amount of the first part be Tk. x

So, the second part = (5500 – x) Tk. At the rate of 4%, interest earned from the first part = .04x × 3 = .12x.

At 5% rate, interest earned form second part = .05 (5500 – x) × 6 = .3 (5500 – x)

According to question, .3(5500 – x) = .12x × 3 $\Rightarrow$ 1650 - .3x = .36x = .66x $\Rightarrow x$ = 2500

$\therefore$ Investment in second part = 5500 – 2500 = Tk. 3000 **(Ans.)**

16. At, 10% simple interest, Simple interest of 5 years = 1500 × 5× $\frac{10}{10}$ = Tk.750;

After 5 years total amount will be (1500 +750) = Tk.2250;
Here, we need additional interest (2500 – 2250) = Tk.250;

So, 250 = 2250 × n × $\frac{10}{100} \Rightarrow n = \frac{250\times 100}{2250\times 10} \Rightarrow n = 1.11$ {n = number of years}

So, The total time = (5 + 1.11) = 6.11 year. **(Ans)**

17. Amount invested in Bangladesh Biman bond is Tk x

$\therefore$ Investment in DEF = (1000000 – x)

$\therefore$ Earning in 1 year by 12% = $\frac{12x}{100} = \frac{3x}{25}$

And earning from DEF

$= (10{,}00{,}000 - x) \times \frac{10}{100} \times 1 = \frac{1000000 - x}{10} \Rightarrow \frac{3x}{25} + \frac{1000000 - x}{10} = 115000$

$\Rightarrow 12x + 1000000 - 10x = 11500000 \Rightarrow 2x + 1000000 = 11500000$

$\Rightarrow 2x = 1500000 \quad \therefore x = 7500$

Answer: 7500 tk was invested in Bangladesh Biman bond.

18. Let the share of A be TK. x;

So, the share of B = (25000 - x) Tk.

At compound profit of 8% per year after two years A'S profit will be

$= x - x\,(1+8\%) = x - x(1.08)^2 = x - 1.1664x = 0.1664x$

Again, at simple interest of 10% per year B'S profit will be after two years = (25000 - x) × 10% × 2 = 5000 - 0.2x

According to the question,

$5000 - 0.2x - 0.1664x = 1336; \Rightarrow -0.3664x = 1336 - 5000; \Rightarrow -0.3664x = -3664 \Rightarrow -x = \frac{3664}{0.3664} = 10{,}000$

So, the share of A in the father's property TK.10,000

Answer: The share of A in the father's property TK.10,000

19. Given,
Principal = 1260
Rate of interest = 10%
Number of years = 2

$\therefore A = p\left(1+\frac{r}{100}\right)^n$

$\therefore$ Amount to be paid after 2nd year

$= 1260\left(1+\frac{10}{100}\right)^2 = 1260\left(\frac{110}{100}\right)^2 = 1260 \times \frac{11}{10} \times \frac{11}{10}$

$\Rightarrow 1260 \times 1.21 \quad \Rightarrow 1524.60$

$\therefore$ If he wants to pay by two equal installments, he should pay annually

$= \frac{1524.6}{2} = 762.3\text{Tk}$ **Ans : 762.3 Tk.**

20. Given,
Principal, P = Tk 10,000; Rate, r = 12%; Time, n = 2 years

We know, simple interest = Pnr = $100{,}000 \times 12\% \times 2 = 100{,}000 \times \frac{12}{100} \times 2 = 24000$

$\therefore$ Simple interest = Tk. 24000; For compound interest, We know $C = P\left(1+\frac{r}{m}\right)^{nm}$

$\Rightarrow C = 100{,}000\left(1+\frac{10\%}{2}\right)^{2\times2} = 100{,}000(1+0.5)^4 = 121550 = 100{,}000 \times 1.2150 = 1{,}21{,}550$

$\therefore$ Compound interest = 1,21,550 – 100,000 = Tk. 21,550;

Since simple interest earns more than compound interest here, Mr. Rafiq should invest his money at an interest rate of 12% simple interest.

21. Total interest of Tk. 600 = 8% of Tk. 600 = $\frac{8}{100} \times 600$ = Tk. 48

Rest of the total amount = 6000 – 600 = Tk. 5400

Then, Total interest of Tk. 5400 = 7% of Tk. 5400 = $\frac{7}{100} \times 5400$ = Tk. 378

Total interest of Tk. 6000 for one year = 378 + 48 = Tk. 426 **(Answer)**

22. At 12% rate, interest income = $50{,}00{,}000 \times \frac{12}{100} = 60{,}0000$

At 15% rate, interest income = $80{,}00{,}000 \times \frac{15}{100} = 120{,}0000$

$\therefore$ After one year his total income = 60,0000 + 120,0000 = Tk. 180,0000

At 10% rate, income tax = $180,0000 \times \frac{10}{100}$ = 180,000

Answer: income = Tk. 180,0000 and tax = Tk. 180,000

23. Let Mr, x invests = Tk y

At the rate of 8% interest.

According the question,

$2400 \times 5\% + y \times 8\% = (2400 + y) \times 6\% \Rightarrow 12000 + 8y = 14400 + 6y$

$\Rightarrow 8y - 6y = 14400 - 12000 \Rightarrow 2y = 2400 \Rightarrow y = \frac{2400}{2} = 1200$

So Mr. x will have to invest Tk. 1200 at the rate of 8% **(Answer)**

24. Let the amount of the first part be Tk. x

So, the second part = $(5500 - x)$ Tk.

At the rate of 4%, interest earned from the first part = $.04x \times 3 = .12x$.

At 5% rate, interest earned form second part = $.05\ (5500 - x) \times 6 = .3\ (5500 - x)$

According to question,

$\Rightarrow .3(5500 - x) = .12x \times 3$

$\Rightarrow 1650 - .3x = .36x = .66x = 1650$

$\Rightarrow x = 2500$

$\therefore$ Investment in second part = 5500 – 2500 = Tk. 3000 **(Answer)**

25. Let, he deposited Tk. x at the account offering 8% interest.

So, Tk. $(120,000 - x)$ was deposited at the other account.

And interest from = Tk. $(120,000 - x)$ is 10% of $(120,000 - x)$

$= .1(120,000 - x)$

Total interest = $.08x + .1(120,000 - x) = 10000$

$\Rightarrow .08x + 12000 - .10x = 10,000$

$\Rightarrow -.02x = -2000 \Rightarrow x = \frac{2000}{.02} = 100000$

$\therefore$ He deposited Tk. 100,000 **(Answer)**

26. Let, the amount of lent money at 8% be Tk. x;

$\therefore$ another part Tk $(1550 - x)$.

According to question, $\frac{8 \times x}{100} + \frac{6(1550 - x)}{100} = 106$

$\Rightarrow \frac{8x + 9300 - 6x}{100} = 106 \Rightarrow 2x + 9300 = 10600 \Rightarrow 2x = 1300 \Rightarrow x = 650$

So, the amount of lent money at 8% is Tk 650 and another part is Tk (1550 – 650) = 900.

$\therefore$ **Answer: Tk 650 and Tk 900**

27. Given, Principal, P = Tk 10,000; Rate, r = 12%; Time, n = 2 years

We know, simple interest = Pnr = $100,000 \times 12\% \times 2 = 100,000 \times \frac{12}{100} \times 2 = 24000$

∴ Simple interest = Tk. 24000;

For compound interest, We know $C = P\left(1+\frac{r}{m}\right)^{nm}$

$\Rightarrow C = 100{,}000\left(1+\frac{10\%}{2}\right)^{2\times2} = 100{,}000(1+0.5)^4 = 121550 = 100{,}000\times1.2150 = 1{,}21{,}550$

∴ Compound interest = 1,21,550 – 100,000 = Tk. 21,550;

Since simple interest earns more than compound interest here, Mr. Rafiq should invest his money at an interest rate of 12% simple interest.

28. Let, C invests = TK x

B invests = TK 2x/3

A invests = TK 3×2x/3 = TK 2x

Ratio of investment = A : B : C = 2x : 2x/3 : x = 6 : 2 : 3

Sum of ratio=6+2+3=11

Share of B = 6600 × 2/11 = TK 1200 (Ans.)

29. After 3 years,

Shakil's investment = Tk. (25,000 × 3 + 10,000 × 2 + 10,000 × 1) = Tk. 105000

Raihan's investment = Tk. (35000 × 2) = Tk. 70000

Jafor's investment = Tk. (35000 × 1) = Tk. 35000

So, Shakil:Raihan:Jafor = 105000 : 70000 : 35000 = 3 : 2 : 1

Sum of their ratio= 3 + 2 + 1 = 6

So, Raihan's share = Tk. 150000 × 2/6 = Tk. 50000 **(Ans.)**

30. Ratio of the capitals of A, B and C = (20000 × 5 + 15000 × 7) : (20000 × 5 + 16000 × 7) : (20000 × 5 + 26000 × 7) = 205000: 212000: 282000 = 205: 212: 282

∴ Sum of the ratio = 699

∴ A's share = $69{,}900\times\frac{205}{699}$ = Tk. 20500, B's share = $69{,}900\times\frac{212}{699}$ = Tk. 21200

C's share = $69{,}900\times\frac{282}{699}$ = Tk. 28200. **Answer: Tk. 20500, Tk. 21200 and Tk. 28200**

31. Say, the original investments of A, B and C are 3*x*, 2*x* and 4*x* respectively.

We know total annual investment is equivalent to total monthly investment in a year.

So, (3*x* × 36) : [2*x* × 12) + (2*x* + 270000) × 24] : [(4*x* × 24) + (4*x* + 270000) × 12] = 3 : 4 : 5

Taking first two ratio we get,

$\Rightarrow 108x : (72x + 6480000) = \frac{3}{4}$

$\Rightarrow 432x = 216x + 19440000$

$\Rightarrow 216x = 19440000$

$\Rightarrow x = 90000$

Hence, A's original investment = 3*x* = 2,70,000 tk

B's original investment = 2*x* = 1,80,000 tk

C's original investment = 4*x* = 3,60,000 tk. **Answer: 2,70,000, 1,80,000, 3,60,000.**

32. Given that the ratio of the investment of A & B = 70% and 30%

∴ A: B = 70% : 30% = 7: 3

After joining C, the share of C = 20%

After joining C, the total share of A and B = (100 – 20) % = 80%

Now A's share is = $\left(\frac{7}{10}\times 80\%\right)$ = 56% **Answer: A's share is 56%**

33. Let, capital of C = Tk. x
Capital of B = Tk. $4x$
And capital of A= Tk. $\frac{4x\times 3}{2}$ = Tk. $6x$
Ratio of three capital, A : B : C = $6x : 4x : x$ = 6 : 4 : 1
Sum of the ratio = 6 + 4 + 1=11
So, profit ratio = 6 : 4 : 1
Profit excluding Administrative expenses = 250000 – 250000 × 20% = 2,00,000

A's share of profit = 2,00,000 × $\frac{6}{11}$ = Tk. 1,09,090.

B's share of profit = 2,00,000 × $\frac{4}{11}$ = Tk. 72,727.

C's share of profit = 2,00,000 × $\frac{1}{11}$ = Tk. 18,183. **(Answer)**

34. Their profit sharing ratio as their investing ratio = 120000 : 135000 : 150000 = 8 : 9 : 10
∴ Sum of ratio = (8 + 9 + 10) = 27

Share of A = 56700 × $\frac{8}{27}$ = Tk. 16800

Share of B = 56700 × $\frac{9}{27}$ = Tk.18900

Share of C = 56700 × $\frac{10}{27}$ = TK. 21000; **Answer:** Tk 16800, Tk.18900, Tk. 21000

35. Given the ratio of A, B and C = $\frac{7}{2} : \frac{4}{3} : \frac{6}{5}$

$= \frac{7}{2}\times 30 : \frac{4}{5}\times 30 : \frac{6}{5}\times 30$ = 105 : 40 : 36

Let, they initially invested Tk. 105, Tk. 40
And Tk 36 Respectively
∴ Ratio of investments = [(105 × 4) + (150 % of 105 × 8] : 40 × 12 : 36 × 12
= 1680 : 480 : 432
$\Rightarrow$ 35 : 10 : 9

∴ B's share = Tk $(21600\times \frac{10}{54})$ = Tk. 4000

Answer: B's share in the profit is Tk 4000.

36. For managing, A received = 5% of Tk. 7400 = Tk. 370.
Balance = Tk. (7400 – 370) = Tk. 7030.
Ratio of their investments = (6500 × 6) : (8400 × 5) : (10000 × 3)

= 39000 : 42000 : 30000 = 13 : 14 : 10

∴ B's share = Tk. $\left(7030 \times \frac{14}{37}\right)$ = Tk. 2660. **Answer: Tk. 2660**

37. Let, B's capital be Tk. x.

∴ A's investment = (3500 × 12)

and B's investment = $7x$

∴ According to the question,

$\frac{3500 \times 12}{7x} - \frac{2}{3}$

$\Rightarrow 14x = 126000$

$\Rightarrow x = 9000.$

∴ Contribution of B is Tk. 9000 **(Answer)**

38. Let, C's capital be x

∴ B's capital be $4x$

It is given that $3 \times 4x = 2 \times$ A's capital

$\Rightarrow 12x = 2A$

$\Rightarrow A = 6x$

∴ We get, A : B : C = $6x : 4x : x = 6 : 4 : 1$

B's share = $\frac{297000}{11} \times 4 = 108000$

Answer: The share of profit of B is Tk. 108000

39. Polash started the business on the first day of 2008.

∴ Polash invested for one year.

Let, Polash invested Tk. x

∴ x Tk for 1 year = $12x$ Tk invested for one month

According to the question,

Qader invested Tk. $2x$

∴ $2x$ Tk for July to December or for 6 months = $(6 \times 2x) = 12x$ Tk. for one month

In the same way,

Sohel invested $3x$ Tk. from September to December = 4 months

∴ $3x$ Tk. for 4 months = $12x$ Tk. for one month.

∴ Polash : Qader : Sohel $\Rightarrow 12x : 12x : 12x \Rightarrow 1 : 1 : 1$

∴ Shohel will get = $(\frac{1}{3} \times 72000)$ = 24000 Tk. **(Answer).**

40. Let the amount of Pintu be Tk. x

The amount of liton = $(x - 70)$ Tk.

The amount of Ripon = $(x - 70 + 45)$ Tk.

Then, $x + x - 70 + x - 70 + 45 = 280$

$\Rightarrow 3x = 280 + 140 - 45$

$\Rightarrow 3x = 280 + 95$

$\Rightarrow 3x = 375 \Rightarrow x = 125$

So the amount of Liton = 125 – 70 = Tk. 55

The part of whole profit of Liton = $\frac{55}{280}$ of 56 = Tk. 11 **(Answer)**

41. Let, the total profit be Tk. 100.

After paying to charity, *A*'s share = Tk. $95 \times \frac{3}{5}$ = Tk. 57.

If *A*'s share is Tk. 57, total profit = Tk. 100.

If *A*'s share is Tk. 855,

Total profit = $\left(855 \times \frac{100}{57}\right)$ = Tk. 1500. **(Answer).**

42. Let, initial investments be $3x$, $5x$ & $7x$ taka.

so, $(3x - 45600) : 5x : (7x + 337600) = 24 : 59 : 167$.

$\therefore \frac{3x - 45600}{5x} = \frac{24}{59} \Rightarrow x = 47200.$

$\therefore$ Initial investment of *A* = Tk. 47200×3 = Tk. 141600. **(Answer)**

43. Ratio of Apple, Peaches and Grapes =6:5:2

Sum of ratio=(6+5+2)=13

Apple=39* (6/13)=18 pounds

Grapes= 39*(2/13)=6 pounds

The difference= 18-6=12 pounds (Ans.)

44. Amount of apple juice = 100% - (20+20)& = 60%

So apple juce= 60% of 750 ml = 750* 60/100 = 450 ml

Added water in the 750 ml of the drink= 250 ml

Ratio of water to apple juice = 250:450 = 5:9 (Ans.)

45. Let, Rahim bought x kg of rice costing Tk 5

and y kg of rice costing Tk 6.

Total cost = $5x + 6y$

$\therefore$ His selling price = 7 $(x + y)$ Tk.

We get, 120% of $(5x + 6y) = 7\ (x + y)$

$\Rightarrow \frac{6}{5}\ (5x + 6y) = 7\ (x + y)$ $\Rightarrow 30x + 36y = 35x + 35y$ $\Rightarrow -5x = -y \Rightarrow \frac{x}{y} = \frac{1}{5}$

$\therefore x : y = 1 : 5$

$\therefore$ The ratio of the mixture is 1: 5. **Answer: 1: 5.**

46. Let, the number of teachers is x and the number of teachers is $11x$

$\therefore$ Number of teachers $x = \frac{33,80,000}{2600} = 130$

Number of students = $130 \times 11 = 1430$ **Answer: 1430**

47 Let, the number of green tomatoes be $4x$ and the number of red tomatoes be $3x$.

According to the question,

$(4x-5):(3x-5)=3:2; \Rightarrow 8x-10=9x-15$

$\Rightarrow 8x-9x=-15+10 \Rightarrow -x=-5$

$\therefore x=5.$

$\therefore$ The number of red tomatoes $=3\times5=15$ **Answer: 15**

48. Ratio of votes of Zaman and Yunus = 4 : 3

Sum of ratio = 4 + 3 = 7

Voters who voted = 581 – 91 = 490

Number of Votes which Zaman got = $\frac{4}{7}\times490=280$

Number of Votes Yunus got = $\frac{3}{7}\times490=210$

$\therefore$ Margin of votes by which Yunus was defeated = 280 – 210 = 70 **Answer: 70**

49. Let, the salary of A, B and C be $2x$, $3x$ and $5x$ respectively.

$\therefore$ After the increments,

A's salary = $2x$ + 15% of $2x$ = $2x + 0.3x = 2.3x$

B's salary = $3x$ + 10% of $3x$ = $3x + 0.3x = 3.3x$

C's salary = 5c + 20% of $5x$ = $5x + x = 6x$

$\therefore$ New ratio = $2.3x : 3.3x : 6x = 23 : 33 : 60$ **(Answer)**

50. Let, each glass contain 12 liters [As the LCM of 3 and 4 is 12]

So, the first glass has $12\times\frac{1}{3}$ = 4 liter milk

And the second has $12\times\frac{1}{4}$ = 3 liter milk

$\therefore$ Total milk = (4 + 7) = 7 liters

When two glasses will be filled with water then water will require = (24 – 7) = 17 liters

$\therefore$ The ratio of milk & water will be 7 : 17 **(Answer)**

51. In the 85 kg of adulterate milk

Milk = $\left(85\times\frac{27}{34}\right)$ kg = $\left(\frac{135}{2}\right)$ kg = 67.5 kg.;

Water = $\left(85\times\frac{7}{34}\right)$ kg = $\left(\frac{35}{2}\right)$ kg = 17.5 kg.

Let, we have to mix x kg of water

According to the question,

$\therefore \frac{67.5}{17.5+x}=\frac{3}{1}$ $3\ (17.5 + x) = 67.5$ or $x = 5$.

$\therefore$ Water to be added = 5 kg. **(Answer).**

52. Let, first part = x

And Second part = $94 - x$

Then $\frac{x}{5} : \frac{94-x}{8} = 3:4 \Rightarrow \frac{\frac{x}{5}}{94-\frac{x}{8}} = \frac{3}{4} \Rightarrow \frac{x}{5} \times \frac{8}{94-x} = \frac{3}{4} \Rightarrow \frac{8x}{470-5x} = \frac{3}{4} \Rightarrow 32x = 1410 - 15x$

$\Rightarrow x = \frac{1410}{47} = 30$ $\therefore$ First is 30 **(Answer).**

53. Let, the number of boy & girls is x & y respectively.
$\therefore$ Total students = $x + y$
According to the question,

$x - y = 12\%$ of $(x+y) \Rightarrow x - y = \frac{12}{100}(x + y) \Rightarrow x - y = \frac{3}{25}(x+y)$

$\therefore 25x - 25y = 3x + 3y \Rightarrow 22x = 28y$

$\Rightarrow \frac{x}{y} = \frac{28}{22} = \frac{14}{11}$. **Answers:** Boys: Girls = 14:11

বিগত বছরের প্রশ্নাবলী ও বিশদ সমাধান	২০১৯ সালে অনুষ্ঠিত সকল সরকারী ও বেসরকারী ব্যাংকের প্রশ্নাবলী ও সমাধান

01. A pot contains 81 liters of pure milk $\frac{1}{3}$ of liters of the milk is replaced by the same amount of water. Again $\frac{1}{3}$ of the mixture is replaced by that amount of water. Find the ratio of milk and water in the new mixture. Sonali Bank Ltd. (SO-19)

Solution: From 1st removal and add replacement.

Milk = $81 - \frac{1}{3}$ of $81 = 81 - 27 = 54$ Liters Milk = $\frac{1}{3}$ of $81 = 24$ Liters

Milk : Water = $54 : 24 = 9 : 4$

From 2nd removal and add replacement.

Milk = $54 - \frac{1}{3}$ of $54 = 54 - 18 = 36$ Liters Milk = $24 + 18 = 42$ Liters

Milk : Water = $36 : 42 = 4 : 5$

Ans : 4 : 5

02. The ratio of the numbers of boys and girls in a school was 5:3. Some new boys and girls were admitted to the school, in the ration 5:7. At this, the total number of students in the school became 1,200 and the ratio of boys to girls changed to 7:5. What was the number of students in the school before new admissions? Combined 5 Bank, Officer (Cash-19) [Written]

Solution:

Let, at first, The number of boys was 5x and girls was 3x

$\therefore$ Total number of students = $5x + 3x = 8x$

The number of boys got admitted = 5y and girls got admitted = 7y.

$\therefore$ Total new students = 5y 7 y = 12y
So, we can write 8x + 12y = 1,200
$\Rightarrow$ 4(2x + 3y) = 1,200
$\therefore$ $2x + 3y = \frac{1200}{4} = 3000$ ..... (i)

Ans $\frac{5x + 5y}{3x + 7y} = \frac{7}{5}$
$\Rightarrow$ 25x + 25y = 21x + 49y
$\Rightarrow$ 4x = 24y
$\therefore$ $x = \frac{24y}{4} = 6y$ ..... (ii)

Putting the value of x in equation (i) we get
2x + 3y = 300
$\Rightarrow$ (2 × 6y) + 3y = 300
$\Rightarrow$ 12y + 3y) = 300
$\Rightarrow$ 15y = 300
$\therefore$ $y = \frac{300}{15} = 20$

Putting y = 20 in equation (ii) we get
x = 6y
$\therefore$ x = 66 × 20 = 120
$\therefore$ The number of student, before admission was = 8x = 8 × 120 = 960 (Answer).

03. 'A' began a small business with a certain amount of money. After four months from the start of the business. 'B' joined the business with an amount which was Tk. 6,000 less than 'A's initial investment. 'C' joined the business after seven months from the start of business with an amount which was Tk. 2,000 less that A's initial investment. At the end of the year total investment repented was Tk. 1,42,000. What will be A's share in the profit, if 'B' received Tk. 8,000 as profit share?

Combined 5 Bank, Officer (Cash-19) [Written]

Solution:

Let, A invested x Tk.
$\therefore$ Total investment will be = 12x + 8 (x – 6,000) + (x – 2,000) Tk.
= 12x + 8x – 48,000 + 5x – 10,000 = (25x – 58,000) Tk.
So, we can write, 25x – 58,000 = 1,42,000
$\Rightarrow$ 25x = 1,42,000 + 58,000 = 2,00,000
$\therefore$ $x = \frac{200000}{25} = 8,000$
$\therefore$ Ratio of profit = (12 × 8,000) : (8 × 2,000) : (5 × 6,000) = 48 : 8 : 15
Here, B's share of profit = 8,000 Tk.
$\therefore$ A's share of profit = 48 × 1,000 = 48,000 Tk.

04. There are two numbers, 1st number is 12 more than the 2nd number. The average of the two numbers is 19. If 2 is added in both numbers, find the ratio of the number. Bangladesh Bank, (AD, 19-04-19) [Written]

Solution:

মনে করি, অপর সংখ্যাটি x
$\therefore$ একটি সংখ্যা = x + 12

প্রশ্নমতে, $\frac{x + x + 12}{2} = 19$

$\Rightarrow \quad 2x + 12 = 38$

$\Rightarrow \quad 2x = 38 - 12 = 26$

$\therefore \quad x = \frac{26}{2} = 13$

অতএব, একটি সংখ্যা = 13 + 12 = 25 এবং অপর সংখ্যাটি = 13.

সংখ্যা দুটির উভয়ের সাথে 2 যোগ করা হলে তাদের অনুপাত হবে = (25 + 2): (13 + 2) = 27 : 18 = 9: 5.

05. A and B started a business with initial investment s in the respective ratio of 18: 7. After four months from the start of the business, A invested Tk. 2,000 more and B invested Tk. 7,000 more At the end of one year, if the profit was distributed among them in the ratio of 2:1 respectively. What was the total initial investment with which A and B started the business?

Sonali Bank, Officer (Cash-19) [Written]

Solution:

Let, A initially invested Tk. 18x & B initially invested Tk. 7x.

Now, A's total investment is equivalent to = 18x × 4 + (18x + 2,000) 8 Tk.

= 72x + 144x + 16,000 = (216x + 16,000) Tk.

& B's total investment is equivalent to = (7x × 4) + (7x + 7,000)8 Tk.

= 28x + 56x + 56,000 = (84x + 56,000) Tk.

Profit was distributed according to their investment ratio, so $\frac{216x + 16000}{84x + 56000} = \frac{2}{1}$

$\Rightarrow \quad 216x + 16,000 = 168x + 1,12,000 \qquad \Rightarrow 48x = 96,000 \qquad \therefore x = \frac{96000}{48} = 2,000$

So, the initial investment of A was = 18 × 2,000 = 36,000 Tk.

& the initial investment of B was = 7 × 2,000 = 14,000 Tk.

∴ Their total investment at the beginning = 36,000 + 14,000 = 50,000 Tk.

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. 2,400 after 2 years. Find the total amount that he received after 2 years.

Sonali Bank, Officer (Cash-19) [Written]

Solution:

If p be the principal, then we know, $p = \frac{100 \times 1}{n \times r}$

$\Rightarrow P = \frac{100 \times 2400}{2 \times 15} = 8,000$ [I = interest; n = years; r = rate of interest]

That man's principal amount is Tk. 8,000.

∴ The compound amount will be, $p = \left(1 + \frac{r}{100}\right)^n$

$= 8,000\left(1 + \frac{15}{100}\right)^2 = 8,000\left(1 + \frac{3}{20}\right)^2 = 8,000\left(\frac{23}{20}\right)^2 = 8,000 \times \frac{23 \times 23}{20 \times 20} = 10,580$ Tk.

07. Mr. Karim borrowed Tk. 500 at 5% simple interest per year. After some time, he borrowed Tic. 1 400 at $\frac{1}{2}$ % simple interest per year for the second time. Six months after the second time borrowing, he

repaid both the borrowed money along with interest and the amount repaid was Tk. 99450. How many years after the first time borrowing Mr. Karim repaid the borrowed money?

NRB Bank Ltd., Management Trainee Officer-19

Solution:

Let, He paid his first borrowings after x years.

Interest = 994.5 – 500 – 400 = 94.5

According to the question:

$$500 \times 5\% \times x + 400 \times 3.5\% \times \frac{6}{12} = 94.5$$

$\Rightarrow 25x + 7 = 94.5$

$\Rightarrow 25x = 94.5 - 7$

$\Rightarrow 25x = 87.5$

So, $x = 3.5$

Ans: 3.5

08. A bucket contains a mixture of two liquids A and B in the proportion 7:5. If 9 liters of mixture is replaced by 9 liters of liquid B, then the ratio of the two liquids becomes 7:9. How much of the liquid A was there in the bucket? *[6 Govt. Banks & 2 FI (SO)- 19, cancelled]*

Solution:

Let, Initial quantity of liquid question Liquid A contains = 7x Liter & Liquid-B Contains = 5x Liter

After removing 9 Liter mixture, A is reduced by $(\frac{7}{12} \times 9) = 5.25$ Liter

and, B is reduced by = (9 – 5.25) = 3.75 liter

Now, quantity of liquid A contains = (7x – 5.25) liter

and, Quantity of liquid B contains = (5x – 3.75 + 9) liter = (5x + 5.25) liter

According to problem,

$$\frac{7x - 5.25}{5x + 5.25} = \frac{7}{9} \quad \Rightarrow 63x - 47.25 = 35x + 36.75 \Rightarrow 25x = 84 \quad \therefore x = 3$$

$\therefore$ Initial quantity of liquid –A is $7 \times 3 = 21$ liter.

Ans: 21 liters

09. ২৪লিটার মিশ্রণে কেরোসিন ও পেট্রোলের অনুপাত ৫:৩। ঐ মিশ্রণে আর কত পেট্রোল মিশালে অনুপাত ৩:৫ হবে?

[Southeast Bank Ltd. TA (Officer)19, Written]

Solution:

২৪ লিটার মিশ্রণে কেরোসিনের পরিমাণ $= \left(২৪ \text{ এর } \frac{৫}{৫+৩}\right) = ১৫$ লিটার

$\therefore$ ২৪ লিটার মিশ্রণে পেট্রোলের পরিমাণ $= \left(২৪ \text{ এর } \frac{৫}{৫+৩}\right) = ৯$ লিটার

ধরি, x লিটার পেট্রোল মেশাতে হবে

$$\therefore ১৫ : ৯ + x = ৩ : ৫ \quad \Rightarrow \frac{১৫}{৯+x} = \frac{৩}{৫} \quad \Rightarrow ২৭ + ৩x = ৭৫ \quad \Rightarrow ৩x = ৪৮ \quad \therefore x = ১৬$$

10. A, B and C started a business by investing Tk. 24000, Tk. 32000 and Tk. 18000 respectively. A and B are active partners and get 15% and 12% of total profit and remaining profit is to be distributed among them in the ratio of their investment. If C got total Tk. 65700 as a profit, what was the total amount of profit? *[4 Govt. Banks Officer (General) 19, Written]*

Solution:

Let, The total profit = x Tk.

Remaining profit percentage = $\{100 - (15 + 12)\}\%$ $= 73\%$

$\therefore$ Remaining total profit = $x \times \frac{73}{100}$ Tk. $= \frac{73x}{100}$ tk

Investment ratio of A, B and C = 24000: 32000: 18000 $= 12:16:9$

$\therefore$ C's share of profit $= \frac{73x}{100} \times \frac{9}{(12 + 16+9)} = \frac{73x}{100} \times \frac{9}{37} = \frac{657x}{3700}$

According to question,

$$\frac{657x}{3700} = 65700 \Rightarrow x = \frac{65700 \times 3700}{657} \quad \therefore x = 370000$$

$\therefore$ Total profit = 370000 tk

Ans: Total profit = 370000tk

11. A finance company declares that, at a certain compound interest rate, a sum of money deposited by anyone will become 8 times in 3 years. If the same amount is deposited at the same compound rate of interest, then in how many years will it become 16 times? *[6 Govt. Banks & 2 FI (SO)- 19, cancelled]*

Solution:

Solution: Let, initial deposit, P = x

For 1st condition,

$\therefore$ Aggregate amount, C = 8x

time period, x = 3 years.

We know that,

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

$\Rightarrow 8x = x(1 + r)^3$

$\Rightarrow 2^3 = (1 + r)^3$

$\therefore 1 + r = 2$ ---------- (i)

For 2nd condition,

Aggregate amount, C = 16x

Let, Time period = n years.

We know that,

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

$\Rightarrow 16x = x(1+r)^n$

$\Rightarrow 16 = (1+r)^n = 2^n$ [From (i)]

$\Rightarrow 2^n = 2^4 \quad \therefore n = 4.$

$\therefore$ In 4 years principal will be 16 times.

Ans. 4 years.

12. A sum of money lent out in simple interest amounts to Tk. 720 after 2 years and to Tk. 1020 after a further period of 5 years. How much money was lent out? *[Sadharab Bima Corporation Asst. Manager19, Written]*

Solution:

Let, The principal = P Tk. & Interest = I Tk.

$\therefore$ P + 2I = 720 Tk. ..... (i)

P + 7I = 1020 Tk. ..... (ii) [Total years in second case = (2+5) = 7 years]

Performing(ii) – (i),

$P + 7I - P - 2I = 1020 - 720 \Rightarrow 5I = 300 \therefore I = 60$

From(i) , $P + 2 \times 60 = 720$ Tk. $\Rightarrow P = (720 - 120)$ Tk. $\therefore P = 600$ Tk.

Ans: P = 600 Tk.

13. A and B started a business by investing Tk 2400 and Tk 3600 respectively. At the end of 4th month from the start of the business, C joined with Tk 'X'. After 8 months from the start of the business, B withdraw Tk 600. If C's share is Tk 8000 in the annual profit of Tk. 22500, what was the amount the C invested in the business? *[Pubali Bank TAJO19, Written]*

Solution:

Ratio of equivalent investment = $(2400 \times 12): (3600 \times 8) + (3000 \times 4): 8x = 28800: 40800 : 8x$

Now, C's Share of profit = $\left(\frac{X}{3600 + 5100 + X} \times 22500\right) = \frac{22500x}{8700 + x}$

According to question,

$\frac{22500x}{8700 + x} = 8000 \Rightarrow 22500x = 69600000 + 8000X \Rightarrow 14500X = 69600000$

$\Rightarrow X = \frac{69600000}{14500} \therefore X = 4800$

Ans: 4800 tk

14. একজন ব্যক্তি ব্যাংকে ৪০০০ টাকা রেখে ৪ বছর পর দেখল মুনাফাসহ ব্যাংকে ৫২৮০ টাকা আছে। আর কত বছর পর সে তার একাউন্টে ৮৮০০ টাকা দেখতে পাবে? *[Southeast Bank Ltd. TA (Officer)19, Written]*

Solution:

আমরা জানি, সুদ = সুদাসল − আসল = (৫২৮০ − ৪০০০) টাকা = ১২৮০ টাকা

এখন,

$I = pnr \Rightarrow ১২৮০ = ৪০০০ \times ৪ \times \frac{r}{১০০} \Rightarrow r = \frac{১২৮০}{১৬০} \therefore r = ৮$

২য় ক্ষেত্রে,

সুদ = (৮৮০০ − ৪০০০) টাকা = ৪৮০০ টাকা

$\therefore$ ৪৮০০ = ৪০০০ × n × $\frac{৮}{১০০}$ $\Rightarrow$ n = $\frac{৪৮০}{৩২}$ $\therefore$ n = ১৫

$\therefore$ অতিরিক্ত সময় লাগবে = (১৫−৪) বছর = ১১ বছর

15. 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. 2,400 after 2 years. Find the total amount that he received after 2 years. *[Sonali Bank Ltd. Recruitment Test for Officer-Cash (Written)-19]*

Solution:

If be the principal, then we know, $p = \frac{100\times1}{n\times1}$

$\Rightarrow p = \frac{100 \times 2400}{2 \times 15} = 8{,}000$ [I = Interest; n = years; r = rate of interest]

That man's principal amount is Tk. 8,000.

$\therefore$ The compound amount will be, $p = \left(1 + \frac{r}{100}\right)^n$

$= 8{,}000\left(1 + \frac{15}{100}\right)^2 = 8{,}000\left(1 + \frac{3}{20}\right)^2 = 8{,}000\left(\frac{23}{20}\right)^2 = 8{,}000 \times \frac{23 \times 23}{20 \times 20} = 10{,}580$ Tk.

বিগত বছরের প্রশ্নাবলী ও বিশদ সমাধান	২০১৮ সালে অনুষ্ঠিত সকল সরকারী ও বেসরকারী ব্যাংকের প্রশ্নাবলী ও সমাধান

01. A vessel contains 28 liters of honey and water solution with honey and water ratio 4: 3, 21 liters of honey-water solution is added to this that his honey to water ratio as 2: 1. Again a 51 liters honey-water solution that has honey to water ratio as 9: 8 is added to this. After this, 10 liters of the solution is replaced with pure honey. What is ratio of water to honey in the final mixture?

[Joint Recruitment Test for 3 Banks (Officer-Cash)-18

Solution:

In first case the amount of honey = $\left(28 \times \frac{4}{4+3}\right)$ liters = 16 liters

$\therefore$ " " " " " " water = $\left(28 \times \frac{4}{4+3}\right)$ liters = 12 liters

In second case the amount of honey = $\left(21 \times \frac{2}{2+1}\right)$ liters = 14 liters

$\therefore$ " " " " " water $= \left(21 \times \frac{1}{2+1}\right)$ liters = 7 liters

In third case the amount of honey $= \left(51 \times \frac{9}{9+8}\right)$ liters = 27 liters

$\therefore$ " " " " " " water $= \left(51 \times \frac{9}{9+8}\right)$ liters = 24 liters

In total 100 liters mixture total amount of honey = (16 + 14 + 27) liters = 57 liters

$\therefore$ " " 100 " " " " water = (12+7+24) liters = 43 liters

$\therefore$ Ratio of honey and water = 57:43

$\therefore$ Now in 10 liters mixture amount of honey = $10 \times \frac{57}{57+43}$ liters = 5.7 liters

$\therefore$ " " 10 " " " " water = $\left(10 \times \frac{43}{57+43}\right)$ liters = 4.3 liters

$\therefore$ Total amount of honey = (57 – 5.7 + 10) liters = 61.3 liters

$\therefore$ " " " water = 43 – 4.3 liters = 38.7 liters

$\therefore$ Ratio of water to honey = 38.7:61.3 liters = 387:613 (Ans)

Alternative Solution:

total amount of honey form three solution.

$= \left[\left(28 \times \frac{4}{7}\right) + \left(21 \times \frac{2}{3}\right) + \left(51 \times \frac{9}{17}\right)\right] = 16 + 14 + 27 = 57$

And total amount of water from three solution,

$= = \left[\left(28 \times \frac{3}{7}\right) + \left(21 \times \frac{1}{3}\right) + \left(51 \times \frac{8}{17}\right)\right] = 12 + 7 + 24 = 43$ liters

$\therefore$ The amount of total solution = 57 + 43 = 100 liters.

Here, 10 liters of pure honey is 10% of 100 liters of solution.

So, this 10% solution will be replaced from both honey and water with 10 liters pure honey.

$\therefore$ The amount of honey after replacement = [57 – (10% of 57) + 10] 67 – 5.7 = 61.3 liters

And the amount of water after replacement = [43 – (10% of 43) + 10] = 43 – 4.3 = 38.7 liters

$\therefore$ Water: Honey = 38.7: 61.3 = 387: 614 [Multiplying by 10]

Answer: 387:613.

02. In a mixture of milk and water , their ratio is 4:5 in the first container. And the same mixture has ratio 5:1 in the second container. In what ratio should the mixture be extracted from each container and poured into the third container, so that the ratio of milk and water comes to 5:4 in the third container? *[Joint Recruitment Test for 5 Banks (Officer)-18]*

Solution:

Amount of milk in first container $= \frac{4}{9}$ Unit

& amount of water in first container $= \frac{1}{6}$ unit

Let, first & second container's ingredients be mixed in x:y

According to question, $\left(\frac{4x}{9} + \frac{5y}{6}\right) : \left(\frac{5x}{9} + \frac{y}{6}\right) = 5:4$

$\Rightarrow \left(\frac{8x + 15y}{18}\right) : \left(\frac{10x + 3y}{18}\right) = 5:4 \Rightarrow \left(\frac{8x + 15y}{18}\right) \times \left(\frac{18}{10x + 3y}\right) = \frac{5}{4} \Rightarrow \left(\frac{8x + 15y}{10x + 3y}\right) = \frac{5}{4}$

$\Rightarrow 50x + 15y = 32x + 60y \Rightarrow 50x - 32x = 60y - 15y \Rightarrow 18x = 45y \Rightarrow 18x = 45y$

$\Rightarrow \frac{x}{y} = \frac{45}{18} \Rightarrow \frac{x}{y} = \frac{5}{2}$

$\therefore$ x:y = 5:2

Ans:5:2

03. A senior citizen invests Tk 50 Lac in a fixed deposit scheme at 11.5% annual interest for six months. In every six months he withdraws Tk 2 Lac from his principal plus interest earned. What will be his principal amount to invest after two years? BB, AD (General-18)

Solution : Here, the principal, p = 50,00,000 Tk

rate of interest, r = 11.5% & time, $n = \frac{1}{2}$

For $1^{st} - 6^{th}$ months, $I_1 = 50,00,000 \times \frac{11.5}{100} \times \frac{1}{2}$ taka.

= 2,87,500 taka.

$\therefore$ Total taka = (50,00,000 + 2,87,500) = 52,87,500 taka.

Since he withdraw taka 2,00,000 then.

the remaining money = (52,87,500 – 2,00,000) = 50,87,500 taka.

Similarly for 2^{nd} – 6th month, $I2 = 50,87,500 \times \frac{11.5}{100} \times \frac{1}{2} = 2,92,531.25$ taka.

The remaining money = (50,87,500 + 2,92,531.25 – 2,00,000) = 51,80,031.25 taka.

Similarly for 3^{rd} 6th month, $I_3 = 51,80,031.25 \times \frac{11.5}{100} \times \frac{1}{2} = 2,97,851.8$ taka.

After withdraw remaining money = (51,80,031.25 + 297,851.5 – 2,00,000)

= 52,77,883.05 taka.

For 4th 6th month, $I_4 = 52,77,883.05 \times \frac{11.5}{100} \times \frac{1}{2} = 3,03,478.28$ taka.

So, after withdraw, remaining take = (52,77,883.05 + 3,03,478.28 – 2,00,000)

= 53,81,361.33 taka.

Ans : 52,81,361.33 taka.

04. Shakil started a business investing Tk 25,000 in 2009. In 2010, he invested an additional amount of Tk 10,000 and Raihan joined him with an amount of Tk 35,000. In 2011 Shail invested another additional amount of Tk 10,000 and Jafor joined them with an amount of Tk 35,000. What will be Raihan's share in the profit of Tk 1,50,000 earned at the end of 3 years from the start of the business in 2009. BB, (CASH OFFICER-2017) [WRITTEN]

Solution:

Total amount of Shakil in yearly is = Tk $(3\times25000 + 2\times10000 + 1\times10000)$

$= \text{Tk } 75000 + 20000 + 10000 = \text{Tk } 105000$

Total amount of Raihan in yearly is Tk $(2\times35000) = \text{Tk } 70000$

Total amount of Jafor in yearly is Tk $(1\times35000) = \text{Tk } 35000$

The ratio of the investments of Shakil, Raihan and Jafor respectively is 105000: 70000: 35000 = 3:2:1 [Divide by 35000]

So, the share of profit of Raihan is Tk $\left(150000\times\frac{2}{3+2+1}\right) = \text{Tk}\left(150000\times\frac{2}{6}\right) = \text{Tk } 50000$

Ans. 50000 Tk

05. Dawood 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?`

BB, (CASH OFFICER-2017) [WRITTEN]

Solution:

Let, the scheme amount of B is Tk x

and " " " " A is Tk y

$\therefore$ " " " " C is Tk (24% of x) = Tk $\left(\frac{240}{100}\times x\right) = \text{Tk}\frac{12x}{5}$

Again " " " C is Tk (15% of y) = Tk $\left(\frac{150}{100}\times y\right) = \text{Tk}\frac{3y}{2}$

$\therefore \frac{12x}{5} = \frac{3y}{2}$

$\Rightarrow 15y = 24x$

$\Rightarrow y = \frac{24x}{15}$

$\therefore y = \frac{8x}{5}$

According to question:

$\left(\frac{8x}{5}\times\frac{10}{100}\times1\right)+\left(x\times\frac{12}{100}\times1\right)+\left(\frac{12}{5}\times\frac{15}{100}\times1\right) = 3200$

$\Rightarrow \frac{4x}{25}+\frac{6x}{50}+\frac{18x}{50} = 3200$

$\Rightarrow \frac{8x+6x+18x}{50} = 3200$

$\Rightarrow \frac{32x}{50} = 3200$

$\Rightarrow x = \frac{3200 \times 50}{32}$

$\therefore x = 5000$

So, the scheme amount of B is Tk 5000 (Ans.)

06. P is working and Q is an investing partner. P puts in Tk 340000 and Q puts Tk 650000. P receives 20% of the profits for managerial works. The rest is distributed in proportion to their capitals. Out of a total profit of Tk 99000, how much does P get? BSC, (Officer-2018) [Written]

Solution:

P gets for managerial works = $\left(99000 \times \frac{20}{100}\right)$ Tk = 19800 Tk

Remaining money = (99000 – 19800) Tk = 79200 Tk

Now, Ratio of the capital of P and Q = 340000: 650000 = 34:65

$\therefore$ Sum of the terms of ratio = 34 + 65 = 99

Now, p gets from capital = $\left(79200 \times \frac{34}{99}\right)$ Tk = 27200 Tk

$\therefore$ p total gets = (19800 + 27200) Tk = 47000 Tk

07. A Lawn is in the form of a rectangle having its sides in the ratio 2:3. The area of the lawn is 1/6 hectares. Find the length and breadth of the lawn. BSC, (Officer-2018) [Written]

Solution: Let

The breadth of the lawn = 2x

$\therefore$ " length " " " = 3x

$\therefore$ " area " " " = $2x \times 3x = 6x^2$

We know,

1 hector = 10000 m^2

$\therefore \frac{1}{6}$ " = $\frac{10000}{6}$ "

According to the question,

$6x^2 = \frac{10000}{6} \Rightarrow x^2 = \frac{10000}{36} \therefore x = \frac{100}{6}$

$\therefore$ The breadth of the lawn, $2x = \left(2 \times \frac{100}{6}\right)$ m = 33.33m

$\therefore$ " length " " " $3x = \left(3 \times \frac{100}{6}\right)$ m= 50m

08. A, B and C are partners 'A' whose money has been in the business for 4 months claims $\frac{1}{8}$ of the profits; 'B' whose money has been in the business for 6 months claims $\frac{1}{3}$ of the profits. If 'C' had Tk. 1560 is the business for 8 months, how much money did A and B contribute to the business?

Sonali Bank Ltd., Officer (Cash -2018) [Written]

Solution:

A Claim $\frac{1}{8}$ of the Profit, B Claims $\frac{1}{3}$ of the Profit

Ratio of their profit = $\frac{1}{8} : \frac{1}{3} : \frac{13}{24}$ = 3: 8: 13

Let A's investment be Tk. x

B's " be Tk y

According to question, 4x:6y: (1560 × 8) = 3: 8: 13

Now, $\frac{9}{16}$ y ..... (1)

Again, $\frac{6y}{1560 \times 8} = \frac{8}{13} \Rightarrow = \frac{1560 \times 8 \times 8}{13 \times 6}$

$\therefore$ y = 1280

(1) $\Rightarrow x = \frac{9}{16} \times 1280$

$\therefore$ x = 720

Ans: 720 Tk. and 1280 Tk.

09. A, B and C enter into partnership. A invests 3 times as much as B invests and B invests two-third of what C invests. At the end of the year, the profit earned is Tk. 6,600. What is the share of B?

Sonali Bank Ltd., (Officer -2018) [Written]

Solution:

Let, C invests Tk 3x

B " Tk $\left(2x \times \frac{2}{3}\right)$ = Tk 2x

and A " Tk (2x × 3) = Tk 6x

Now investment ratio of A, B and C = 6x : 2x : 3x = 6 : 2 : 3

Summation of ratio's factors (6 + 2 + 3) = 11

$\therefore$ Amount of hare of B is Tk $\left(\frac{2}{11} \times 6600\right)$ = Tk 1200

Ans. Tk 1200

10. A depositor deposited Tk. 4,000 at x% simple interest and Tk. 5,000 at y% simple interest. He received annual interest of Tk. 320 on his deposited amounts at the year end. If he could deposit Tk. 5,000 at x% simple interest and Tk. 4,000 at y% simple interest, he would receive annual interest of Tk 310. Find the value of x and y.

Sonali Bank Ltd., (Officer -2018) [Written]

Solution:

According to the questions

$4000 \times \frac{x}{100} + 5000 \times \frac{y}{100} = 320$

$\Rightarrow$ 40x + 50y = 320

$\Rightarrow$ 4x + 5y = 32 ..... (i)

And,

$5000 \times \frac{x}{100} + 4000 \times \frac{y}{100} = 310$

$\Rightarrow$ 50x + 40y = 310

$\Rightarrow$ 5x + 4y = 31 ..... (ii)

Adding (i) + (ii),

9x + 9y = 63

$\Rightarrow$ x + y = 7

$\therefore$ $5x + 5y = 35$ ..... (iii)

(iii) – (i) $\Rightarrow$

$x = 3$

$\therefore$ $y = 7 - 3 = 4$

Ans: $x = 3$, $y = 4$

11. Mr. Karim gave 40% of the money he had, to his wife. He also gave 20% of the remaining amount to each of his three sons. Half of the amount now left was spent on miscellaneous items and the remaining amount of Tk 12,000/- was deposited in the bank. How much money did Mr. Karim have initially?

Janata Bank Ltd., Asst. Relationship (Officer-2018) [Written]

Solution:

Let, Mr. Karim initially had x Tk.

" " gave to his wife $\left(x \times \frac{40}{100}\right)$ Tk

$= \frac{2x}{5}$ Tk

$\therefore$ Redmaining money $= \left(x - \frac{2x}{5}\right)$ Tk

$= \frac{3x}{5}$ Tk

Now,

He gave to his three sons $= \left(\frac{3x}{5} \times \frac{20}{100} \times 3\right)$ Tk

$= \frac{9x}{25}$ Tk

$\therefore$ Remaining money $= \left(\frac{15x}{5} - \frac{9x}{25}\right)$ Tk

$= \frac{15x - 9x}{25}$ Tk

$= \frac{6x}{25}$ Tk

$\frac{6x}{25}$

Amount spent of miscellaneous items $= \frac{}{2}$ Tk

$= \frac{6x}{50}$ Tk

$\therefore$ Remaining money $= \left(\frac{6x}{25} - \frac{6x}{50}\right)$ Tk

$= \frac{6x}{50}$ Tk

According to question,

$\frac{6x}{50} = 12000$

$\Rightarrow x = \frac{12000 \times 50}{6}$

$\therefore$ $x = 100000$

Ans: Mr. Karim initially had 100000 Tk.

12. In a business A invests Tk 60/- more than B. The capital of B remained invested for $7\frac{1}{2}$ months, while the capital of A remained invested for 2 more months. If the total profit be Tk 620/- and B gets Tk 140/- less than what A gets, then what will be the amount of A's capital?

Janata Bank Ltd., Asst. Relationship (Officer-2018) [Written]

Solution:

Let, B invests Tk x

$\therefore$ A " Tk $(x + 600)$

Now,

The equivalent investment of B is $\frac{15x}{2}$ Tk

$\therefore$ " " " " A " $\left\{\frac{19}{2}(x + 600)\right\}$ Tk

$= \frac{19x + 11400}{2}$ "

So, A:B $= \frac{19x + 11400}{2} : \frac{15x}{2}$

$= (19x + 11400) : 15x$

Let, The profit gain by B is y

$\therefore$ $y + y + 140 = 620$

$\Rightarrow 2y = 480$

$\therefore$ $y = 240$

Now, We get,

$19x + 11400 : 15x = 380 : 240$

$\Rightarrow \frac{19x + 1140}{15x} = \frac{380}{240}$

$\Rightarrow \frac{19x + 1140}{15x} = \frac{19}{12}$

$\Rightarrow 228x + 136800 = 285x$

$\Rightarrow 57x = 136800$

$\therefore$ $x = 2400$

So the amounts that A invests $(x + 600)$ or $(2400 + 600)$ Tk

$= 3000$ Tk

.

13. A man's salary in 2014 was 20 thousand Taka per month and it is increased by 10% each year. Find how much he earned in the years 2015 to 2017 inclusive. Rupali Bank Ltd., Officer (Cash-2018 [Cancelled)]

Solution:

His salary in 2014 = 20,000 Tk per month

$\therefore$ " " " 2015 $= \left(20{,}000 + 20{,}000 \times \frac{10}{100}\right) = 22{,}000$ Tk per montsh

$\therefore$ His total income in 2015 $= (22{,}000 \times 12)$ Tk $= 2{,}64{,}000$ Tk ..... (i)

Now, His salary in 2016 $= \left(22{,}000 + 22{,}000 \times \frac{10}{100}\right)$ Tk. per month $= 24{,}200$ Tk per month

$\therefore$ His total income in 2016 $= (24{,}200 \times 12)$ Tk $= 2{,}90{,}400$ Tk..... (ii)

Similarly his salary in 2017 $= \left(24{,}200 + 24{,}200 \times \frac{10}{100}\right)$ Tk per month $= 26{,}620$ Tk per month

$\therefore$ His total incme in 2017 $= (26{,}620 \times 12)$ Tk $= 3{,}19{,}440$ Tk ..... (iii)

∴ His total income from 2015 to 2017 is = (2,64,000 + 2,90,400 + 3,19,440) Tk [from (i), (ii) and (iii)]
= 8,73,840 Tk (Ans)

14. A and B started a business with capitals of Tk. 3000 and Tk. 4000 respectively. After 8 months, A invested Tk. 2500 more in the business and 7 months after this, total profit becomes Tk. 980. Find the share of profit for each. BKB, Officer (Cash-2018)

Solution:

A's invest = (3000 × 15 + 7 × 2500) Tk.
= (4500 + 17500) Tk.
= 62,500 Tk.

B's " = (4000 × 15) Tk.
= 60,000 Tk.

Now, A:B = 62,500: 60,000 = 25:24

∴ Now, Summatation of the numbers of the ratio is 25 + 24 = 49

∴ B's profit = $980 \times \frac{25}{49} = 480$ Tk.

∴ A's profit is Tk. 500 and B's profit is Tk. 480 (Ans.)

15. .শতকরা বার্ষিক ৭ টাকা মুনাফায় ৬৫০ টাকার ৬ বছরের মুনাফা কত? BKB, (Data Entry/Control Operator02018) [Written)]

সমাধান:

শতকরা ৭ টাকা মুনাফায়,

১০০ টাকার ১ বছরের মুনাফা ৭ টাকা

∴ ১ " ১ " " $\frac{৭}{১০০}$ "

∴ ৬৫০ " ১ " " $\frac{৭\times৬৫০}{১০০}$ "

∴ ৬৫০ " ৬ " " $\frac{৭\times৬৫০\times৬}{১০০}$ "

সুতরাং মুনাফা ২৭৩ টাকা।

16. রফিক একটি কাজ ১০ দিনে করতে পারে। শফিক ঐ কাজ ১৫ দিনে করতে পারে। তারা একত্রে কত দিনে কাজটি শেষ করতে পারবে?

BKB, (Data Entry/Control Operator02018) [Written)]

সমাধান:

রফিক ১০ দিনে করে সম্পূর্ণ বা ১ অংশ কাজ

∴ " ১ " " " $\frac{১}{১০}$ " "

শফিক ১৫ দিনে করে সম্পূর্ণ বা ১ অংশ কাজ

∴ " ১ " " " $\frac{১}{১৫}$ " "

সুতরাং

রফিক এবং শফিক একত্রে ১ দিনে করে $\left(\frac{১}{১০}+\frac{১}{১৫}\right)$ অংশ

$= \frac{৩+২}{৩০}$ "

$= \frac{১}{৬}$ "

∴ ২ জন একত্রে $\frac{১}{৬}$ অংশ কাজ করে ১ দিনে

∴ ২ ” ” ১ ” ” ” (৬ × ১) ”
= ৬ দিনে

উত্তর: তারা একত্রে কাজটি ৬ দিনে শেষ করতে পারবে।

17. ৩০০ টাকার ৪ বছরের সরল মুনাফা ও ৪০০ টাকার ৫ বছরের সরল মুনাফা একত্রে ১৪৮ টাকা হলে, শতকরা মুনাফার হার কত?

Karmasangsthan Bank (Data Entry Operator 2018)

সমাধান:

মুনাফা = মূলধন × সময় × মুনাফার হার

ধরি,

মুনাফার হার = r%

সুতরাং, $\left(৩০০ \times ৪ \times \frac{r}{১০০}\right) + \left(৪০০ \times ৫ \times \frac{r}{১০০}\right) = ১৪৮$

$\Rightarrow ১২r + ২০r = ১৪৮$

$\Rightarrow ৩২r = ১৪৮$

$\therefore r = ৪.৬২৫$

সুতরাং, মুনাফার হার ৪.৬২৫% (উত্তর)

18. An amount of Tk. 7200 is spent to cover the floor of a room by carpet. An amount of Tk. 576 would be saved if the breadth were 3 metres less. What is the breadth of the room?

Bangladesh Development Bank Ltd. (Senior Officer 2018)

Solution:

এখানে, 576 টাকা কম হলে খরচের পরিমাণ = (7200Ñ 576) = 6624 টাকা।

ধরি, দৈর্ঘ্য = x মিটার

প্রস্থ = y “

∴ ক্ষেত্রফল = xy বর্গমিটার

প্রস্থ ৩ মিটার কম হলে নতুন প্রস্থ = (y – 3) মি.

∴ নতুন ক্ষেত্রফল = x (y − 3) বর্গ মিটার

প্রশ্নমতে,

$\frac{xy}{x(y-3)} = \frac{7200}{6624}$ $\Rightarrow 23xy = 25\ x\ (y-3)$ $\Rightarrow 23xy = 25xy - 75x$

$\Rightarrow 2xy = 75x$ $\Rightarrow y = \frac{75x}{2x}$ $\Rightarrow y = 37.5$ মিটার।

উত্তর: প্রস্থ ৩৭.৫ মিটার।

19. একটি বইয়ের দৈর্ঘ্য ২৫ সেমি ও প্রস্থ ১৮ সেমি। বইটির পৃষ্ঠা সংখ্যা ২০০ এবং প্রতি পাতার পুরুত্ব ০.১ মিমি হলে বইটির আয়তন কত?

Jiban Bima Corporation (Junior Officer 2018)

Solution:

বইটির পৃষ্ঠা সংখ্যা ২০০

∴ ” ” (২০০ ÷ ২) = ১০০

∴ বইটির পুরুত্ব (০.১ × ১০০) মিমি = ১০ মিমি = ১ সেমি

∴ বইটির আয়তন (২৫ × ১৮ × ১) ঘন সেমি = ৪৫০ ঘন সেমি

উত্তর: ৪৫০ ঘন সেমি।

20. ২০,০০০ টাকা আলে ২ বছরের ব্যবধানে চক্রবৃদ্ধি সুদ ও সরল সুদের পার্থক্য ৩৯২ টাকা লে সুদের হার কত?

Jiban Bima Corporation (Junior Officer 2018)

Solution:

ধরি, সুদের হার r%

চক্রবৃদ্ধি মুনাফা = $p\left(১+\frac{r}{১০০}\right)^n - p = ২০০০০\left(1+\frac{r}{100}\right)^2 - ২০০০০ = ২০০০০\left\{\left(১ + \frac{r}{১০০}\right)^2 - ১\right\}$

সরল মুনাফা = pnr

$$= ২০০০০ \times 2 \times \frac{r}{১০০} = ৪০০r$$

শর্তমতে,

$$২০০০০\left\{\left(১ + \frac{r}{১০০}\right)^2 - ১\right\} - ৪০০r = ৩৯২$$

$$\Rightarrow ২০০০০ \times \frac{(১০০ + r)^২}{১০০০০} - ২০০০০ - ৪০০r = ৩৯২$$

$$\Rightarrow ২(১০০ + r)^২ - ২০০০০ - ৪০০r = ৩৯২$$

$$\Rightarrow (১০০ + r)^2 - ১০০০০ - ২০০r = ১৯৬$$

$$\Rightarrow r = ১৪$$

উত্তর: সুদের হার ১৪%

21. In a mixture 60 liters, the ratio of milk and water 2:1. If this ratio is to be 1:2, then estimate the quantity of water in liter to be further added in the mixture. *[Standard Bank Ltd. (TAO)-18]*

Solution:

Sum of the given ratio = 2 + 1 = 3

$\therefore$ Quantity of milk = $\left(60 \text{ of } \frac{2}{3}\right)$ = 40 liters

Hence, quantity of water will be = 60 – 40 = 20 liters.

Let, x liters water needs to be added.

$\therefore$ According to question,

$$\frac{40}{x + 20} = \frac{1}{2} \Rightarrow x + 20 = 80 \quad \Rightarrow x = 80 - 20 = 60 \quad \therefore x = 60$$

So, 60 liters water needs to be added.

Ans: 60

22. A jar contains 'x' liters of milk, a seller withdraws 25 liter of it and sells it at Tk. 20 per litter. He then replaces it water. He repeated the process total three times. Every time while selling he reduces selling price by Tk. 2. After this process milk left in the mixture is only 108 liters so he decided to sell the entire mixture at Tk. 15 per liter. Then how much profit did he earn if bought milk at Tk. 20 per liter?

[Joint Recruitment Test for 8 Banks (SO)-18]

Solution:

He sells first 25 liters at Tk. 20

$\therefore$ Selling price of first 25 liters of milk = 25 × 20 = Tk. 500

He sells second 25 liters at Tk. 18

$\therefore$ Selling price of second 25 liters of milk = 25 × 18 = Tk. 450

He sells third 25 liters at Tk. 16

$\therefore$ Selling price of Third 25 liters of milk = 25 × 16 = 400 tk.

At last Selling price of 108 liters of milk = 15 tk

$\therefore$ Selling price of remaining 108 liters of milk =108 × 15 = Tk. 1,620

His total selling price = 500 + 450 + 400 + 1,620 = Tk. 2,970

His total cost price = 108 × 20 = Tk. 2,160

∴ Profit earned from selling milk = 2,970 – 2,160 = Tk. 810

Ans: He earned as profit Tk. 810

23. A can contains milk and water in the ratio 3:1. A part of this mixture is replaced with milk, and now the new ratio of milk to water is 15:4. What proportion of original mixture had been replaced by milk?

[Joint Recruitment Test for 8 Banks (SO)-18]

Solution:

Let, the original amount of milks is 3x units & the original amount of water is x units

∴ Total amount of original mixture = 3x + x = 4x units

Let, y proportion of mixture is replaced with milk.

∴ According to Problem,

$$\frac{3x+y}{4x}=\frac{15}{19} \Rightarrow 57x+19y=60x \Rightarrow 60x-57x=19y \Rightarrow 19y=3x \quad \therefore y=\frac{3x}{19}$$

$\therefore \frac{3}{19}$ Portion of the original mixture had been replaced by milk

Answer: $\frac{3}{19}$

24. A milk vendor has 2 cans of milk. The first contains 25% water and the rest milk. The second contains 50% water. How much milk should he mix from each of the container. So as to get 12 liters of milk such that the ratio of water to milk is 3:5?

[Sonali Bank Ltd. (IT/ICT) 18]

Solution:

Let, the cost of 1 litter of milk is 1 Tk.

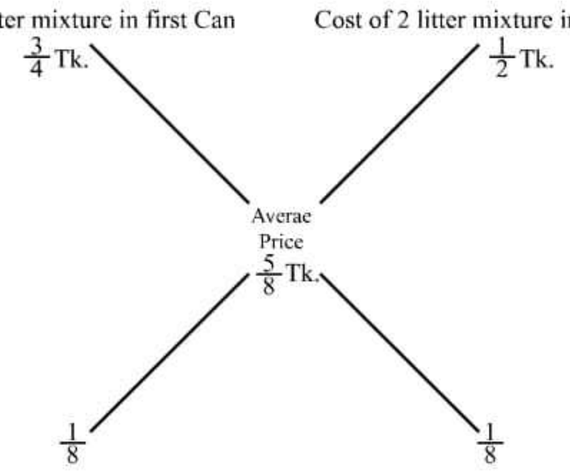
In first case,

In 1 litter mixture the amount of milk is $\frac{3}{4}$ litter

∴ The cost of 1 litter mixture is $\frac{1}{2}$ Tk.

Now, the amount of milk into both mixture = $\left(\frac{3}{4}+\frac{1}{2}\right)=\frac{5}{4}$ litter

And, it's real cost is = $\left(\frac{3}{4}+\frac{1}{2}\right)=\frac{5}{4}$ Tk.



Now, we will apply the mixture rule:

So, the ratio of mixture = $\frac{1}{8} : \frac{1}{8} = 1 : 1$

$\therefore$ The amount of milk to be taken from each can = $\left(\frac{1}{2} \times 12\right) = 6$ liter

Ans: 6 litter.

25. Amin has 12 pieces of Tk. 10 and Tk. 5 notes in his wallet. If the total value of all the notes is less than Tk. 95, What is the maximum number of Tk. 10 notes that he has? *[Sonali Bank Ltd. (Officer)-18]*

Solution:

Given that, total notes = 12

Let, the number of Tk. 10 notes = x $\therefore$ The number of Tk. 5 notes = 12 – x

According to the question,

$(10 \times x) + 5 \times (12 - x) < 95 \Rightarrow 10x + 60 - 5x < 95 \Rightarrow 5x < 35 \therefore x < 7$

So, the maximum number of Tk. 10 notes is 6

Ans: 6

26. A, B and C enter into partnership. A invests 3 times as much as B invests and B invests two-third of what C invests. At the end of the year, the profit earned is Tk. 6,600. What is the share of B?

[Sonali Bank Ltd. (Officer)-18]

Solution:

Let, C invest is = x Tk.

B invest is = $\frac{2x}{3}$ Tk. & A invest is = $\frac{2x}{3} \times 3 = 2x$ Tk.

$\therefore$ The ratio of investment by A, B and C = $2x : \frac{2x}{3} : x = 6x : 2x : 3x$ [Multiplying by 3]

Sum of their investment = 6x + 2x + 3x = 11x

$\therefore$ B's share of the profit = $\left(6600 \text{ of } \frac{2x}{11x}\right) = 1{,}200$ Tk.

Ans. 1,200 Tk.

27. A depositor deposited Tk. 4,000 at x% simple interest and Tk. 5,000 at y% simple interest. He received annual interest of Tk. 320 on his deposited amounts at the year end. If he could deposit Tk. 5,000 at x%

simple interest and Tk. 4,000 at y% simple interest, he would receive annual interest of Tk. 310. Find the value of x and y. *[Sonali Bank Ltd. (Officer)-18]*

Solution:

We know, $I = \frac{prt}{100}$, Where [I = Interest, p= Principal, t = Time]

Here, according to question for 1st & 2nd part

$\frac{4000 \times x \times 1}{100} + \frac{5000 \times y \times 1}{100} = 320$ ..... (i) And, $\frac{5000 \times x \times 1}{100} + \frac{4000 \times y \times 1}{100} = 310$ ..... (ii)

Now, from (i)

$\frac{4000x}{100} + \frac{4000y}{100} = 320 \Rightarrow \frac{4000x + 5000y}{100} = 320 \Rightarrow 4{,}000x + 5{,}000y = 320 \times 100$

$\Rightarrow 4x + 5y = 32 \quad \therefore 4x + 5y = 32$ ..... (iii)

Again, from (ii) we have,

$\frac{5000x}{100} + \frac{4000y}{100} = 310 \Rightarrow \frac{5000x + 4000y}{100} = 310$

$\Rightarrow 5{,}000x + 4{,}000y = 310 \times 100$

$\Rightarrow 5x + 4y = 31$ [Divide both side by 1,000] $\therefore 5x + 4y = 31$ ..... (iv)

Performing (iii) × 4 – (iv) × 5, $-9x = -27 \quad \therefore x = 3$

From (iii), $(4 \times 3) + 5y = 32 \Rightarrow 5y = 20 \quad \therefore y = 4$

Ans. The required value, x = 3 & y = 4.

28. ৩০০ টাকার ৪ বছরের সরল মুনাফা ও ৪০০ টাকার ৫ বছরের সরল মুনাফা এক্ষেত্রে ১৪৮ টাকা হলে, শতকরা মুনাফার হার কত?
[Karmasangstan Bank Ltd. (DEO)-18]

Solution:

আমরা জানি, $I = \frac{Prn}{100}$ [এখানে P = আসল; r = সুদের হার; n = বছর]

প্রশ্নমতে, $\frac{300 \times r \times 4}{100} + \frac{400 \times r \times 5}{100} = 148 \Rightarrow 12r + 20r = 148 \Rightarrow 32r = 148 \quad \therefore r = \frac{148}{32} = 4.625\%$

Ans: 4.625%

29. What will be the deposited amount at initial stage, if it became to Tk. 33,500 at the end of 5 years, with a simple interest rate of 13.5% per annum? How many years is will take to become Tk. 40,600 of the same deposited amount?
[Southeast Bank Ltd. (TJO)-18]

Solution:

At, 13.5% interest

Interest of 100 Tk. for 1 year = 13.5 Tk.

$\therefore$ Interest of 100 for 5 years = $(13.5 \times 5) = 67.5$ Tk.

$\therefore$ Aggregate (Principal+ Interest) = $(100 + 67.5) = 167.5$ Tk.

If Aggregate Tk. 167.5 then principal amount = 100 Tk.

$\therefore$ If Aggregate Tk. 1 then principal amount = $\frac{100}{167.5}$ Tk.

$\therefore$ If Aggregate tk. 33,500 then principal amount = $\frac{100 \times 33500}{167.5} = 20{,}000$ Tk.

Now principal, p = 20,000 Tk. $\therefore$ Interest, I = 40,600 – 20,000 = 20,600 Tk.

$\therefore$ Interest rate, $r = 13.5\% = \frac{13.5}{100}$

Let, time = t year We know, $I = \frac{prt}{100}$ $\therefore$ $t = \frac{I \times 100}{pr}$

According to the question,

$\Rightarrow t = \frac{20600 \times 100}{20000 \times 3.5} = \frac{206}{27}$ $\Rightarrow t = 7.6296$ $\therefore$ t = 7.63 years.

Ans. principal amount Tk 20,000 & it became Tk. 40,000 after 7.63 years.

30. A school has 40 rooms that can sit 600 people. Some rooms can sit 10 people and some can sit 20 people. What is the ratio of the number of 10 person rooms to the number of 20 person rooms?

[Solani & Janata Bank Ltd. (SO) IT/ICT-18]

Solution:

The number of 10 seat room = x $\therefore$ The number of 20 seat room = 40 – x

According to question

$10x + 20(40 - x) = 600 \Rightarrow 10x + 800 - 20x = 600 \Rightarrow -10x = 600 - 800 = -200$ $\therefore$ $x = \frac{-200}{-10} = 20$

$\therefore$ Number of 10 seat room = 20 and number of 20 seat room = 40 – 20 = 20.

The ratio of the number of 10 seat room to the number of 20 seat room = 20:20 = 1:1.

Ans: 1:1

31. 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 9,000 taka require that he receives 850 taka as interest. How much should be invest in each company? *[Sonali Bank Ltd. (SO)-18]*

Solution:

Let, He invested Tk. x in company 'M'at 10%

$\therefore$ In 'N' company, he invested Tk. (9,000–x) at 9%

We know, $I = \frac{P \times r \times n}{100}$

$\therefore$ The amount of interest at 10% of Tk. $x = \frac{x \times 10 \times 1}{10} = \frac{x}{10}$ Tk.

And the amount of interest at 9% of Tk. $(9{,}000 - x) = \frac{(9000 - x) \times 9 \times 1}{100} = \frac{9(9000 - x)}{100}$ Tk.

According to question. $\frac{x}{10} + \frac{9(9000 - x)}{100} = 850$

$\Rightarrow x + 81{,}000 = 85000 \quad \Rightarrow x = 85{,}000 - 81{,}000 \quad \therefore x = 4{,}000$

He will invest 4,000 Tk. in company 'M' and (9,000 – 4,000) = 5,000 Tk. in company 'N'.

Ans: 4,000 Tk. in company 'M' and 5,000 Tk. in company 'N'.

32. Lamia owns a hairdressing salon .She borrows TK .2500 from a bank to make improvement to her beauty salon. She is charged 4.5% per year compound interest .She pays the money back 3 years. Calculate the total amount Lamia must pay to the bank. *[Dhaka Bank Ltd. (MTO)-18]*

Solution:

In case of compound interest, we know C(Principal + Interest) = $P\left(1 + \frac{r}{100}\right)^n$

Here C = Principal + Interest; P = Principal = 2,500 Tk; r = Interest rate = $4.5\% = \frac{45}{10}\% = \frac{9}{2}\%$;

n = Number of years = 3 years.

So, $C = 2{,}500\left(1 + \frac{9}{2 \times 100}\right)^3 \Rightarrow C = 2{,}500\left(1 + \frac{9}{200}\right)^3 \Rightarrow C = 2{,}500\left(\frac{9+200}{200}\right)^3$

$\Rightarrow C = 2{,}500\left(\frac{209}{200}\right)^3 \Rightarrow C = \frac{2500 \times 209 \times 209 \times 209}{200 \times 200 \times 200} \Rightarrow C = 2{,}852.915$

$\therefore$ C = 2,852.92 Tk.

∴ Lamia must pay in total Tk. 2,852.92

Ans. Tk. 2,852.92

33. A senior citizen invest Tk.50 lac in a fixed deposit scheme at 11.5% annual interest for six months. In every six months he withdraws Tk. 2 lac from his principal plus interest earned. What will be his principal amount to invest after two years? *[Bangladesh Bank (AD)-18]*

Solution:

Here, the principal, p = 50,00,000 Tk rate of interest, r = 11.5% & time, $n = \frac{1}{2}$

For 1st – 6th months, $\mathbf{I_1} = 50,00,000 \times \frac{11.5}{100} \times \frac{1}{2}$ = 2,87,500 taka.

∴ Total taka = (50,00,000 + 2,87,500) = 52,87,500 taka.

Since he withdraw taka 2,00,000 then.

the remaining money = (52,87,500 – 2,00,000) = 50,87,500 taka.

Similarly for 2nd – 6th month, $I2 = 50,87,500 \times \frac{11.5}{100} \times \frac{1}{2} = 2,92,531.25$ taka.

The remaining money = (50,87,500 + 2,92,531.25 – 2,00,000) = 51,80,031.25 taka.

Similarly for 3rd 6th month, $\mathbf{I_3} = 51,80,031.25 \times \frac{11.5}{100} \times \frac{1}{2} = 2,97,851.8$ taka.

After withdraw remaining money = (51,80,031.25 + 297,851.5 – 2,00,000)

= 52,77,883.05 taka.

For 4th 6th month, $\mathbf{I_4} = 52,77,883.05 \times \frac{11.5}{100} \times \frac{1}{2} = 3,03,478.28$ taka.

So, after withdraw, remaining take = (52,77,883.05 + 3,03,478.28 – 2,00,000)

= 53,81,361.33 taka.

Ans : 52,81,361.33 taka.

34. P is a working and Q is an investing partner. P puts in Tk. 3,40,000 and Q puts Tk.650000. P receives 20% of the profits for managerial works . The rest is distributed in proportion to their capitals. Out of a total profit of Tk.99,000 how much does p get? *[Joint Recruitment Test for 5 Banks (Officer)-18]*

Solution:

P gets s managerial works = $\left(99000 \times \frac{20}{100}\right)$ Tk. = 19,800 Tk.

$\therefore$ Residual amount of profit = 99,000 – 19,8000 Tk.

= 79,200 Tk.

Now, ratio of their investment = 3,40,000 : 6,50,000 = 34:65

Sum of the ratio = 34 + 65 = 99

$\therefore$ P will get = $\left(79200 \times \frac{34}{99}\right)$ = 27,2000 + 19,8000 Tk. = 47,000 Tk.

Ans: 47,000 Tk.

35. A lawn is in the form of a rectangle having its sides in the ratio 2:3.The are of the lawn is $\frac{1}{6}$ hectares. Find the length and breadth of the lawn. *[Joint Recruitment Test for 5 Banks (Officer)-18]*

Solution:

Let, the length of the lawn is 2x meter & the breadth of the lawn is 3x meter

$\therefore$ Area = $(2x \times 3x)\ m^2 = 6x^2\ m^2$

We know, 1 hector = 10,000 m^2 $\therefore \frac{1}{6}$ hector = $\frac{10000}{6}\ m^2$

According to question,

$6x^2 = \frac{10000}{6}$ $\Rightarrow x^2 = \frac{10000}{6\times6}$ $\Rightarrow x = \sqrt{\left(\frac{100}{6}\right)^2}$ $\therefore x = \frac{100}{6} = \frac{50}{3}$

$\therefore$ The length of the lawn = $2x = \left(2 \times \frac{50}{3}\right) = \frac{100}{3}$ meter = 33.33 meter

& the breadth of the lawn = $3x = \left(3 \times \frac{50}{3}\right)$ = 50 meter.

Ans: 33.33 meter & 50 meter.

36. A school has 40 rooms that can sit 600 people. Some rooms can sit 10 people and some can sit 20 people. What is the ratio of the number of 10 person rooms to the number of 20 person rooms?

[Sonali & Janata Bank Ltd. (SO) IT/ICT-18]

Solution:

The number of 10 seat room = x $\therefore$ The number of 20 seat room = 40 – x

According to question

$10x + 20\ (40 - x) = 600$ $\Rightarrow 10x + 800 - 20x = 600$ $\Rightarrow -10x = 600 - 800 = -200$ $\therefore x = \frac{-200}{-10} = 20$

$\therefore$ Number of 10 seat room = 20 and number of 20 seat room = 40 – 20 = 20.

The ratio of the number of 10 seat room to the number of 20 seat room = 20:20 = 1:1.

Ans: 1:1

37. In a business A invests Tk. 600 more than B. The capital of B remained invested for $7\frac{1}{2}$ months, while the capital of A remained invested for 2 more months. If the total profit be Tk. 620 and B gets Tk. 140 less than what A gets, then what will be the amount of A's capital? *[Janata Bank Ltd. (EO)-18]*

Solution:

Let, B invests Tk x $\quad\quad$ $\therefore$ A invests Tk (x + 600)

$\therefore$ The equivalent investment of B = $x \times 7\frac{1}{2} = \frac{15x}{2}$ Tk

$\therefore$ The equivalent investment of A $= \{(x + 600) \times 9\frac{1}{2}\} = \left\{\frac{19}{2}(x + 600)\right\}$ Tk $= \frac{19x + 11400}{2}$ tk

So, A:B = $\frac{19x + 11400}{2} : \frac{15x}{2} = (19x + 11400) : 15x$

Let, The profit gain by B is y

$\therefore$ Atp, $y + y + 140 = 620 \Rightarrow 2y = 480 \therefore y = 240$

$\therefore$ B's Profit= 240 tk & A's profit =240+140=380 tk

Now, According to problem,

19x + 11400: 15x = 380 : 240

$\Rightarrow \frac{19x + 1140}{15x} = \frac{380}{240} \Rightarrow \frac{19x + 1140}{15x} = \frac{19}{12} \Rightarrow 228x + 136800 = 285x \Rightarrow 57x = 136800 \quad \therefore x = 2400$

So the amounts that A invests =(x + 600) = (2400 + 600) Tk = 3000 Tk

Ans: A's capital = Tk. 3,000.

38. A, B and C are partners. 'A' whose money has been in the business for 4 months claims $\frac{1}{8}$ of the profits; 'B' whose money has been in the business for 6 months claims $\frac{1}{3}$ of the profits. If 'C' had Tk. 1,560 in the business for 8 months, how much money did A and B contribute to the business?

[Sonali Bank Ltd. (Officer-Cash) 18]

Solution:

C will get as profit = $1-\left(\frac{3+8}{24}\right) = 1-\frac{11}{24} = \frac{24-11}{24} = \frac{13}{24}$ part

$\therefore$ A, B & C investment ratio = $\frac{1}{8}:\frac{1}{3}:\frac{13}{24} = 3:8:13$ $=3x:8x:13x$

Now, let, A's investment is x Tk. ,B's investment is y Tk.

and C's investment is given 1,560 Tk.

$\therefore$ **Equivalent investment: A= x** $\times$ 4= 4x ; B= y $\times$ 6= 6y And C= 1560$\times$ 8

According to problem, 13x=1560$\times$ 8 $\therefore$ x=960

$\therefore$ A's profit = 3 $\times$ 960=2880 & $\therefore$ B's profit =8 $\times$ 960=7680

$\therefore$ A's investment, 4x=2880 $\Rightarrow x = \frac{2880}{4}$ $\therefore$ x=720

$\therefore$ B's investment,6y= 7680 $\Rightarrow y = \frac{7680}{6}$ $\therefore$ y=1,280

$\therefore$ A and B invested respectively 720 Tk. and 1,280 Tk. respectively.

Ans: 720 Tk. and 1,280 Tk.

39. A and B started a business with capitals of Tk. 3,000 and Tk. 4,000 respectively. After 8 months, A invested Tk. 2,500 more in the business and 7 months after this, total profit becomes Tk. 980. Find the share of profit for each. *[Bangladesh Krishi Bank Ltd. (OC)-18]*

Solution:

Total business time = (8 + 7) months = 15 months.

$\therefore$ A's time weighted investment = [3,000 $\times$ 8) + (3,000 + 2,500) $\times$ 7] Tk.

= (24,000 + 38,500) Tk. = 62,500 Tk.

$\therefore$ B's time weighted investment = 4,000 $\times$ 15 Tk. = 60,000 Tk.

So, investment ratio = 62,500:60,000 = 25:24 [Dividing by 2,500]

Now, sum of their investment = 25 + 24 = 49

So A's profit = $\left(980 \times \frac{25}{49}\right)$ Tk. = 500 Tk & B's profit = $\left(980 \times \frac{24}{49}\right)$ = 480 Tk.

Ans. The share of profit of A = 500 Tk. & B = 480 Tk.

40. 8% interest rate is Tk. 12.80. What is the principal amount? *[NCC Bank Ltd. (MTO)-18]*

Solution:

Let, the principal be Tk. x

$\therefore$ Amount of compound interest $= x\left(1+\frac{8}{100}\right)^2 - x = x\left(\frac{100+8}{100}\right)^2 - x = x\left(\frac{108}{100}\right)^2 - x = x\left(\frac{27}{25}\right)^2 - x$

$= x \times \frac{729}{625} - x = \frac{729x}{625} - x = \frac{104x}{625}$ Tk.

And amount of simple interest $= \left(x \times 2 \times \frac{8}{100}\right) = \frac{4x}{25}$ Tk.

According to the question,

$\frac{104x}{625} - \frac{4x}{25} = 12.80 \Rightarrow \frac{104x - 100x}{625} = 12.80 \Rightarrow 4x = 625 \times 12.80 \Rightarrow x = \frac{625 \times 12.80}{4} = 625 \times 3.20$

$\therefore$ x = 2,000 Tk.

Ans: Principal amount is Tk. 2,000