

This PDF includes important theorem and related illustrations that are very important for all government and private jobs seekers .

Theorem 1:

A sum of Rs Y is lent out in n parts in such a way that the interest on first part at $r_1\%$ for t_1 years, the interest on second part at $r_2\%$ for t_2 years similarly the interest on third part at $r_3\%$ for t_3 years and so on, are equal then the ratio in which the sum was divided in n parts given by,

$$\frac{1}{r_1 t_1} : \frac{1}{r_2 t_2} : \frac{1}{r_3 t_3}$$

Example 1 : A sum of Rs 4500 is divided into two parts such that the interest on one part is 10% for 5 years and is equal to that on another part at 12.5 % for 4 years. Find the ratio of both sums ?

Solution : Let there are two parts, so as per theorem we apply formula directly,

$$\frac{1}{r_1 t_1} : \frac{1}{r_2 t_2}$$

$$= \frac{1}{10 \times 5} : \frac{1}{12.5 \times 4} = \frac{1}{50} : \frac{1}{50} = 1:1$$

Example 2 : A sum of Rs 12,000 is divided into two parts such that the interest on one part is 3% for 4 years and is equal to that on another part at 4 % for 2 years. Find the ratio of both sums ? also find the value of both the parts?

Solution : Let there are two parts, so as per theorem we apply formula directly,

$$\frac{1}{r_1 t_1} : \frac{1}{r_2 t_2}$$

$$= \frac{1}{3 \times 4} : \frac{1}{4 \times 2} = \frac{1}{12} : \frac{1}{8} = \frac{1}{3} : \frac{1}{2} = 2 : 3$$

Thus ratio in which principle will be divided to get equal interest is 2 : 3

So, value of part A will be = $\frac{2}{5} \times 12000 = 4800$

And value of part B will be = $\frac{3}{5} \times 12000 = 7200$

Example 3 : A sum of Rs 24,000 is divided into three parts such that the interest on all three parts is equal, for first part rate of interest is 3% for 4 years, for second part at 4 % for 2 years and for third part money is invested at 3% for 2 year. Find the ratio of money invested in all three parts ? also find the value of all the parts?

Solution : Let there are three parts A, B and C, so as per theorem we apply formula directly,

$$\frac{1}{r_1 t_1} : \frac{1}{r_2 t_2} : \frac{1}{r_3 t_3}$$

$$= \frac{1}{3 \times 4} : \frac{1}{4 \times 2} : \frac{1}{3 \times 2} = \frac{1}{12} : \frac{1}{8} : \frac{1}{6} = \frac{1}{6} : \frac{1}{4} : \frac{1}{3}$$

Now find the L.C.M. of 6, 4 and 3 that is 12, and multiply this with all fractions we get ratio

$$\frac{1}{6} \times 12 : \frac{1}{4} \times 12 : \frac{1}{3} \times 12 = 2 : 3 : 4$$

So, ratio in which principle will be divided to get equal interest is 2 : 3 : 4

So, value of part A will be = $\frac{2}{9} \times 24000 = 5333$

value of part B will be = $\frac{3}{9} \times 24000 = 8000$

value of part C will be = $\frac{4}{9} \times 24000 = 10667$

Q4. A sum of Rs.10,400 is lent out in two parts in such a way that the interest on the first part at 10% for 5 years is equal to that on the other part at 9% for 6 years. Find the value of both sums.

Solution: Let there are two parts, so as per theorem we apply formula directly,

$$\frac{1}{r_1 t_1} : \frac{1}{r_2 t_2} \\ = \frac{1}{10 \times 5} : \frac{1}{9 \times 6} = \frac{1}{50} : \frac{1}{54} = \frac{1}{25} : \frac{1}{27} = 27 : 25$$

Thus ratio in which principle will be divided to get equal interest is 27 : 25

So, value of part A will be = $\frac{27}{52} \times 10400 = 5400$

And value of part B will be = $\frac{25}{52} \times 10400 = 5000$

Q5. A sum of Rs.36,400 is lent out in two parts in such a way that the interest on the first part at 10% for 5 years is equal to that on the other part at 9% for 6 years. Find the value of both sums.

Solution: Let there are two parts, so as per theorem we apply formula directly,

$$\frac{1}{r_1 t_1} : \frac{1}{r_2 t_2} \\ = \frac{1}{10 \times 5} : \frac{1}{9 \times 6} = \frac{1}{50} : \frac{1}{54} = \frac{1}{25} : \frac{1}{27} = 27 : 25$$

So, ratio in which principle will be divided to get equal interest is 27 : 25

So, value of part A will be = $\frac{27}{52} \times 10400 = 5400$

And value of part B will be = $\frac{25}{52} \times 10400 = 5000$