

Assignment 1

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ICSE 10th, 2014 paper

Question 1(b) Ranbir borrows ₹20,000 at 12 % compound interest. If he repays ₹8400 at the end of the first year and ₹9680 at the end of the second year, find the amount of loan outstanding at the beginning of the third year.

Therefore, we know that he still has ₹6000 to pay to the bank.

⇒ Roshan still owes to the bank ₹6000 out of the ₹20,000 he had borrowed, after the two annual payments.

Solution:

Initial loan taken by Ranbir, $P = ₹20000$

Interest rate, $I = 12\%$

Time between compounding, $T = 1\text{year}$

Amount in compound interest,

$$A = P * (1 + I/100)^T$$

(Value of I is in percent)

Therefore, amount due at the end of one year is

$$A = 20000 * (1 + 12/100)^1$$

$$A = ₹22400$$

Amount paid at the end of one year is ₹8400.

Thus remaining amount,

$$A = 22400 - 8400$$

$$A = ₹14000$$

Now, amount due at the end of the second year is

$$A = 14000 * (1 + 12/100)^1$$

$$A = ₹15680$$

Amount paid at the end of second year is ₹9680.

Thus remaining amount,

$$A = 15680 - 9680$$

$$A = ₹6000$$