ARITHMETIC (Q 1, PAPER 1)

Lesson No. 6: Interest

2007
1 (b) €8500 was invested for 2 years at compound interest.
(i) The rate of interest for the first year was 4%.
Find the amount of the investment at the end of the first year.
(ii) The amount of the investment at the end of the second year was €9237.80.
Find the rate of interest for the second year.
SOLUTION
1 (b) (i) If the sum of money <i>P</i> is invested for <i>n</i> years at the rate per annum of <i>R</i> % which remains unchanged for each year then the amount at the end of <i>n</i> years is: $A = P\left(1 + \frac{R}{100}\right)^n \dots 3$
Year 1: $P = \&8,500$ $A = P\left(1 + \frac{R}{100}\right)^n = 8500\left(1 + \frac{4}{100}\right)^1 = \&8,840$ R = 4 A = ?
1 (b) (ii)
Year 2: P = €8,840 n = 1 R = ? $A = P\left(1 + \frac{R}{100}\right)^n \Rightarrow 9237.8 = 8840\left(1 + \frac{R}{100}\right)^1$
$A = €9237 \cdot 80 \qquad \Rightarrow \left(1 + \frac{R}{100}\right) = \frac{9237.8}{8840} \Rightarrow 1 + \frac{R}{100} = 1.045 \Rightarrow \frac{R}{100} = 0.045$
$\therefore R = 4.5\%$

2003

1 (c) (ii) What sum of money invested at 6% per annum compound interest will amount to €5000 in 7 years?

Give your answer correct to the nearest euro.

SOLUTION

$$R = 6\%$$

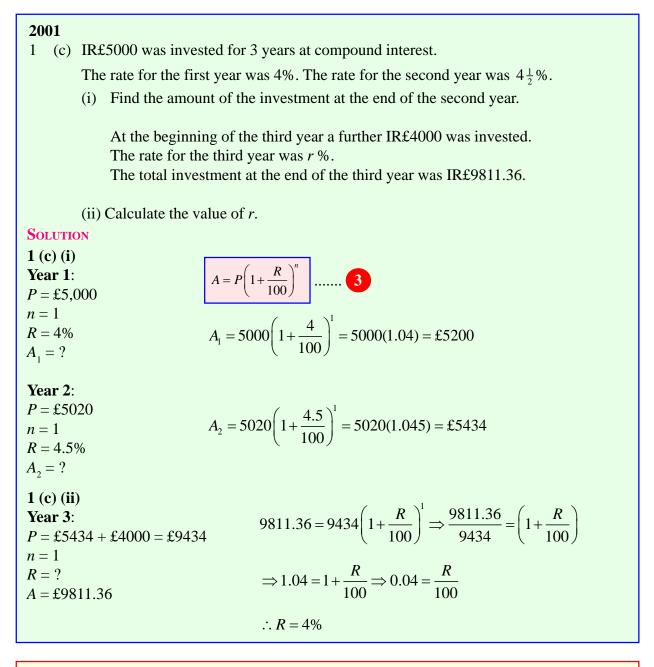
$$A = €5,000$$

$$n = 7$$

$$P = ?$$

$$5000 = P\left(1 + \frac{6}{100}\right)^{7} \Longrightarrow 5000 = P(1.06)^{7}$$

$$\therefore P = \frac{5000}{(1.06)^{7}} = €3,325$$



1998

1 (b) (i) At what rate of interest will IR£2000 amount to IR£2065 after one year? **SOLUTION**

$$R = ?$$

$$P = \pounds 2,000$$

$$A = \pounds 2,065$$

$$n = 1$$

$$2065 = 2000 \left(1 + \frac{R}{100}\right)^{1} \Rightarrow \frac{2065}{2000} = \left(1 + \frac{R}{100}\right)$$

$$\Rightarrow 1.0325 = 1 + \frac{R}{100} \Rightarrow 0.0325 = \frac{R}{100}$$

$$\therefore R = 100 \times 0.0325 = 3.25\%$$

1997	
1 (b) IR£2500 The rate of second ye Calculate If the inve	was invested for three years at compound interest. of interest was 4% per annum for the first year and 3% per annum for the ear. the amount of the investment after two years. estment amounted to IR£2744.95 after three years, calculate the rate of er annum for the third year.
SOLUTION	
1 (b) Year 1: $P = \pounds 2500$ R = 4% n = 1 $A_1 = ?$	$A = P \left(1 + \frac{R}{100} \right)^n \dots 3$ $A_1 = 2500 \left(1 + \frac{4}{100} \right)^1 = 2500(1.04) = \pounds 2600$
Year 2: $P = \pounds 2600$ R = 3% n = 1 $A_2 = ?$	$A_2 = 2600 \left(1 + \frac{3}{100}\right)^1 = 2600(1.03) = \pounds 2678$
Year 3: $P = \pounds 2678$ R = ? n = 1 $A_3 = \pounds 2744.95$	$2744.95 = 2678 \left(1 + \frac{R}{100} \right)^1 \Rightarrow \frac{2744.95}{2678} = 1 + \frac{R}{100}$ $\Rightarrow 1.025 = 1 + \frac{R}{100} \Rightarrow \frac{R}{100} = 0.025$
	$\therefore R = 0.025(100) = 2.5\%$