

MEMO 2024-12 ~~EH~~-00015(3) Revision from past papers

- (1) How many years will it take for an article to depreciate to half its value according to the reducing-balance method at 7% per annum? (4)

$$A = x \quad \checkmark$$

$$A = P(1 - i)^n$$

$$P = 2x$$

$$x = 2x(1 - 0,07)^n \quad \checkmark$$

$$i = \frac{7}{100} = 0,07$$

$$(1 - 0,07)^n = \frac{x}{2x} = \frac{1}{2}$$

$$n = ? \text{ years}$$

$$\therefore n = \log_{(1-0,07)} \left(\frac{1}{2} \right)$$

$$\therefore n = \frac{\log\left(\frac{1}{2}\right)}{\log(0,93)} \quad \checkmark$$

$$\therefore n \approx 9,55 \text{ years} \quad \checkmark$$

- (2) Two friends each receive an amount of R6 000 to invest for a period of 5 years. They invest the money as follows: (6)

- Radesh: 8,5% per annum simple interest. At the end of the 5 years, Radesh will receive a bonus of exactly 5% of the principal amount.
- Thandi: 8% per annum compounded quarterly.

Who will have the bigger investment after 5 years? Justify your answer with appropriate calculations.

Radesh:

$$A = P(1 + in)$$

$$A = 6\,000(1 + 0,85 \times 5)$$

$$A = \text{R}8\,550 \quad \checkmark$$

Plus bonus:

$$= \text{R}8\,550 + 5\% \times \text{R}6\,000$$

$$= \text{R}8\,850 \quad \checkmark$$

Thandi:

$$A = P(1 + i)^n$$

$$A = 6\,000 \left(1 + \frac{0,08}{4} \right)^{5 \times 4} \quad \checkmark$$

$$A = \text{R}8\,5915,68 \quad \checkmark$$

$\therefore$ Thandi's investment is best. $\checkmark$

- (3) Nicky opened a savings account with a single deposit of R1 000 on 1 April 2011. She then makes 18 monthly deposits of R700 at the end of every month. Her first payment is made on 30 April 2011 and her last payment on 30 September 2012. The account earns interest at 15% per annum compounded monthly.

(6)

Determine the amount that should be in her savings account immediately after her last deposit is made (that is on 30 September 2012).

Nicky opened a savings account with a single deposit of R1 000 on 1 April 2011. She

Final amount = R1 000 with interest + annuity ✓

$$= \underset{\checkmark}{1\,000} \left(1 + \frac{0,15}{12} \right)^{18} + \frac{700 \left[\left(1 + \frac{0,15}{12} \right)^{18} - 1 \right]}{\frac{0,15}{12}} \quad \checkmark$$

$$= 1\,250,577... + 14\,032,33...$$

$$\approx \mathbf{R15\,282,91} \quad \checkmark$$