

LC 2016 (SET A): PAPER 1

QUESTION 7 (55 MARKS)

Paul's money to invest: €8000

Option 1	Option 2
2% interest in Year 1	3.7% compound interest per year, for 3 years
3% interest in Year 2	
5% interest in Year 3	
Money can be taken out at the end of Year 1 or Year 2 without penalty.	Money may not be taken out until the end of Year 3

Question 7 (a)

End of Year 1: $€8000 \times 1.02 = €8160$

End of Year 2: $€8160 \times 1.03 = €8404.80$

End of Year 3: $€8404.80 \times 1.05 = €8825.04$

Value of the investment using **Option 1** = €8825.04

MARKING SCHEME NOTES

Question 7 (a) [Scale 10D (0, 2, 4, 6, 10)]

- 2: • Any effort at calculation of interest on €8000 at 2% or 3% or 5%
- 4: • One correct calculation, €160 or €8160
• Uses simple interest leading to €8800 or €800
- 6: • Two correct calculations, €244.80 or €8404.80
• Finds correct interest for each year but fails to finish
• Fully correct formulation of amount

Question 7 (b)

Value of the investment using **Option 2** = $€8000 \times (1.037)^3 = €8921.26$

MARKING SCHEME NOTES

Question 7 (b) [Scale 10D (0, 2, 4, 6, 10)]

- 2: • Relevant use of 3.7%
- 4: • One correct calculation, €296 or €8296
• Use of simple interest leading to €8888, or €888
- 6: • Two correct calculations, €306.95 or €8602.95
• Finds correct interest for each year but fails to finish
• Fully correct formulation of amount

Question 7 (c)

Access to his money. An emergency may arise during the 3 years where Paul may need some money. Option 1 allows him access to his money after Year 1 or Year 2.

MARKING SCHEME NOTES

Question 7 (c) [Scale 5A (0, 5)]

Question 7 (d)

$$P = \text{€}8000$$

$$F = \text{€}9000$$

$$t = 3 \text{ years}$$

$$r = ?$$

$$F = P(1+i)^t$$

$$9000 = 8000(1+i)^3$$

$$\frac{9}{8} = (1+i)^3$$

$$1+i = \sqrt[3]{\frac{9}{8}} = 1.04$$

$$\therefore i = 0.04 \Rightarrow r = 4\%$$

MARKING SCHEME NOTES**Question 7 (d) [Scale 10C (0, 2, 5, 10)]**

- 2:**
- At least one correct substitution
 - Correct formula
 - Correct answer no work
 - $9000 - 8000 = 1000$
- 5:**
- Fully correct substitution into formula but fails to finish

Question 7 (e)

(i) $v = 8000 + 36t - 1.2t^2$

$$t = 12: v = 8000 + 36(12) - 1.2(12)^2 = \text{€}8259.20$$

(ii) Interest earned = $\text{€}8259.20 - \text{€}8000 = \text{€}259.20$

$$\text{Mary's interest rate} = \frac{259.20}{8000} \times 100\% = 3.24\%$$

MARKING SCHEME NOTES**Question 7 (e) (i) [Scale 10C (0, 2, 5, 10)]**

- 2:**
- Any correct substitution into formula
- 5:**
- Fully correct substitution into formula but fails to finish
 - Subs $t = 1$ giving answer of 8034.80

Question 7 (e) (ii) [Scale 10C (0, 2, 5, 10)]

- 2:**
- Brings down interest or amount from e (i)
 - Relevant work
- 5:**
- Formulates correctly