



Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE APPLIED

2010

MARKING SCHEME

MATHEMATICAL APPLICATIONS

COMMON LEVEL

**MARKING SCHEME
LEAVING CERTIFICATE APPLIED, 2010**

MATHEMATICAL APPLICATIONS

GENERAL GUIDELINES FOR EXAMINERS

1. Penalties of three types are applied to candidates' work as follows:

- Blunders - mathematical errors/omissions (-3)
- Slips - numerical errors (-1)
- Misreadings (provided task is not oversimplified) (-1).

Frequently occurring errors to which these penalties must be applied are listed in the scheme. They are labelled as B1, B2, B3,....., S1, S2, S3,....., M1, M2, etc. Note that these lists are not exhaustive.

2. When awarding attempt marks, e.g. Att(3), it is essential to note that
- any correct relevant step in a part of a question merits *at least* the attempt mark for that part
 - if deductions result in a mark which is lower than the attempt mark, then the attempt mark must be awarded
 - a mark between zero and the attempt mark is never awarded.
3. Worthless work is awarded zero marks. Some examples of such work are listed in the scheme and they are labelled as W1, W2,.....etc.
4. The *same* error in the *same* section of a question is penalised *once* only.
5. Special notes relating to the marking of a particular part of a question are indicated by an asterisk. These notes immediately follow the box containing the relevant solution.
6. Particular cases, verifications and answers derived from diagrams (unless requested) qualify for attempt marks only.
7. The phrase “and stops” means that no more work is shown by the candidate.

QUESTION 1

Part (a)	5 marks	Att 2
Part (b)	5 marks	Att 2
Part (c)	5 marks	Att 2
Part (d)	5 marks	Att 2
Part (e)	5 marks	Att 2
Part (f)	5 marks	Att 2
Part (g)	5 marks	Att 2
Part (h)	5 marks	Att 2
Part (i)	5 marks	Att 2
Part (j)	5 marks	Att 2

Part (a) 5 marks Att 2

Calculate $\sqrt{39 \cdot 3}$, correct to one decimal place.

(a) 5marks Att 2

$$\begin{aligned} \text{(a)} \quad & \sqrt{39 \cdot 3} \\ & = 6.268971207 \\ & = 6.3 \end{aligned}$$

* Accept correct answer with no work.

Blunders (-3)

B1 Answer = $(39 \cdot 3)^2 = 1544.49$

B2 Answer = $39 \cdot 3 \div 2 = 19.65$

B3 Misplaced decimal

Slips (-1)

S1 Failure to round or incorrect rounding

Attempts (2 marks)

A1 $39 \cdot 3 \times 2 = 78.6$

Worthless (0)

W1 Answer = $39 \cdot 3 \pm 2 = 41.3/37.3$

Part (b)

5 marks

Att 2

Find the cost of 18 cans of soft drinks, if a six-pack costs €2.49.

(b)

5 marks

Att 2

(b) $2.49 \times 3 = \mathbf{€7.47}$ or $2.49 \div 6 = .415 \times 18 = \mathbf{€7.47}$

* Accept correct answer with no work.

* Accept answer in cent form but must indicate this.

Blunders(-3)

B1 Misplaced decimal

B2 Answer = €2.49 ÷ 6 (.415)

B3 Answer = €2.49 ÷ 18 = .13833333

B4 Answer = €2.49 × 18 = 44.82

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Failure to round or incorrect rounding

Attempts(2)

A1 Answer = 18 × 6 (108)

A2 Answer = €2.49 × 6 (14.94)

A3 Answer = 18 ÷ 6 (3)

Worthless(0)

W1 Answer = 18, 6, €2.49

Part (c)

5 marks

Att 2

(c)

Add $\frac{5}{7} + \frac{3}{14}$.

(c)

5marks

Att 2

(c) $\frac{5}{7} + \frac{3}{14} = \frac{10}{14} + \frac{3}{14} = \frac{13}{14}$

* Accept correct answer with no work.

* Accept answer in decimal form .928571428

* Accept equivalent of $\frac{13}{14}$

* Accept answer 13 r 14

Blunders(-3)

B1 Incorrect common denominator (e.g. $\frac{8}{21}$ or .380952381)

B2 Misplaced decimal

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Truncates or rounds the decimal answer

Attempts(2)

A1 Multiplies the fractions ($\frac{15}{98}$ or .153061224)

A2 Divides fractions ($3\frac{1}{3}$)

A3 Subtracts the fractions ($\frac{1}{2}$)

A4 Cross multiply answer = $\frac{21}{70}$ or $\frac{70}{21}$

Part (d)

5 marks

Att 2

In a sale all items are reduced by 20%. During the sale a sweatshirt sells for €31.12. Calculate the cost of the sweatshirt before the sale.

(d)

5marks

Att 2

(d) $31.12 \div 4 \times 5 = \mathbf{\text{€}38.90}$ or $31.12 \div 80 \times 100 = \mathbf{\text{€}38.90}$

* Accept correct answer with no work.

Blunders(-3)

B1 Calculates 20% of €31.12 (6.224)

B2 Misplaced decimal.

B3 Answer = $31.12 + 6.224 = 37.344$

B4 Inverts (eg $31.12 \times 100/20 = 155.6$)

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Failure to round or incorrect rounding

Attempts(2)

A1 Answer = 31.12 ± 20 (51.21/11.21)

A2 Answer = $31.12 \div 4 = 7.78$

A3 Answer = $31.12 \div 80 = .389$

Part (e)

5 marks

Att 2

A letter is chosen at random from the word LEITRIM. What is the probability that the letter chosen is an I?

(e)

5marks

Att 2

(e) $\frac{2}{7}$

* Accept answer written as 2:7, 2 in 7, 2 out of 7 or 0.285714285

Blunders(-3)

B1 No fraction or ratio set up.

B2 Answer = $2 + B1$.

B3 Answer = $7 + B1$.

B4 Answer = $\frac{7}{2}$

B5 Answer = $\frac{1}{7}$

Slips(-1)

S1 Truncates decimal answer.

S2 Answer = $2 - 7$ or 2 to 7

Attempts(2)

A1 Any proper fraction other than $\frac{2}{7}$, $\frac{7}{2}$, $\frac{1}{7}$

(f)

5 marks

Att 2

Given an exchange rate of €1 = £0.91 sterling, convert €255 into sterling.

(f)

5marks

Att 2

(f)

$$€255 \times .91 = \mathbf{£232.05}$$

* Accept correct answer with no work

Blunders(3)

B1 Misplaced decimal

B2 Inverts €255 ($\cdot 003568627$)

B3 Divides by £0.91(280.2197)

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Incorrect or omitted units (£)

S3 Failure to round or incorrect rounding

Attempts(2)

A1 €255 \pm .91 ($255.91/254.09$)

Worthless (0)

W1 Answer = €255 or .91

Part (g)

5 marks

Att 2

Convert 59° Fahrenheit to degrees Celsius, using the formula $C = \frac{5}{9}(F - 32)$

(g)

5marks

Att 2

$$(g) \quad C = \frac{5}{9}(59^\circ - 32^\circ)$$

$$C = \frac{5}{9}(27^\circ)$$

$$C = 15^\circ$$

* Accept correct answer with no work.

Blunders(-3)

B1 Ignores order of operations (e.g. $\frac{5}{9}(59) - 32 = .777777$)

B2 Mishandles $\frac{5}{9}$

B3 Misplaced decimal

B4 Incorrect substitution and continues

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Incorrect or omitted units (degrees only)

Misreadings (-1)

M1 Adds $59^\circ + 32^\circ$ and continues (= 91 → answer = 50.5555)

Attempts(2)

A1 Substitutes for F, correct or incorrectly, and stops.

Part (h)

5 marks

Att 2

Séan has the same number of 20c coins as 5c coins. The total is €5. How many of each type of coin does he have?

(h)

5marks

Att 2

(h) $20 + 5 = 25$ **or** $(20 \times 20c = €4 + 20 \times 5c = €1 = €5)$

$500 \div 25 = 20$

20 of each type coin

* Accept correct answer with no work.

Blunders(-3)

B1 Answer = $€5 \div 20 = 25$ or $20 + 5 = 25$

B2 Answer = $€5 \div 5 \text{ cent} = 100$

B3 Misplaced decimal

B4 Multiplies instead of divides

Attempt (2)

A1 Answer = $20 - 5 = 15$ or $500/15 = 33.3333$

Part (i)

5 marks

Att 2

Add 330 m and 110 cm and express your answer in metres.

(i)

5marks

Att 2

(i) $33000 + 110 = 33110\text{cm} = \mathbf{331.10 m}$ **or** $330 + 1.10 = \mathbf{331.10m}$

*Accept correct answer with no work.

Blunders(-3)

B1 Incorrect conversion

B2 Misplaced decimal

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Incorrect or omitted units.

S3 Truncates or rounds decimal answer

Attempts(2)

A1 Answer = $330 + 110 = 440$

Part (j)

5 marks

Att 2

A journey begins at 11:25 and ends at 13:10. How long does the journey take?

(j)

5marks

Att 2

(j) $13:10 - 11:25 = \mathbf{1 \text{ hour } 45 \text{ minutes.}}$

* Accept answer in minutes (105 minutes)

* Accept answer = $1 \frac{3}{4}$ hours

* Accept answer = 1.75 hours

Blunders(-3)

B1 1 hour = 100 minutes (1.85 or 2 hr 25 min)

B2 Adds rather than subtracts

B3 Misplaced decimal

B4 Answer = 13:45

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Incorrect or omitted units.

S3 Answer = 01:45

Attempts(2)

A1 Answer = 1 hour + any minutes not mentioned above

A2 Answer = 2 hours 35 min.

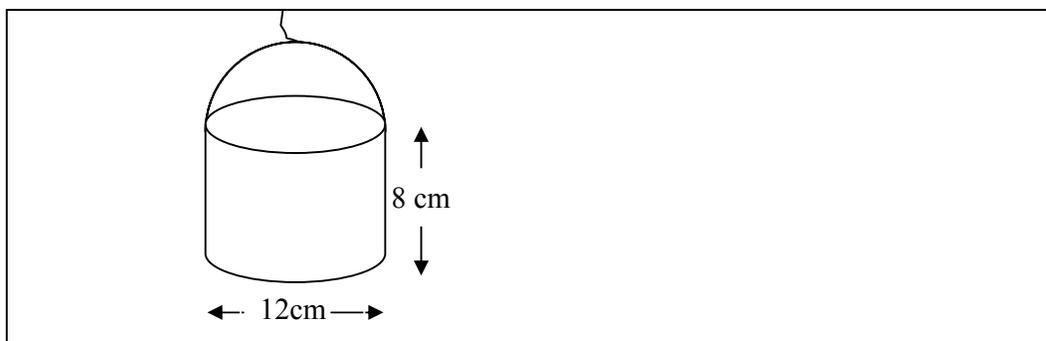
Worthless(0)

W1 Multiplies $13:10 \times 11:25$ (147.375)

QUESTION 2

Part (a)	10 marks	Att 3
Part (b)	5 marks	Att 2
Part (c)	10 marks	Att 3
Part (d)	20 (15, 5) marks	Att (5, 2)
Part (e)	5 marks	Att 2
Part (a)	10 marks	Att 3

The diagram shows a candle in the shape of a cylinder with a hemisphere on top. Calculate the volume of the cylinder, taking $\pi = 3.14$



(a) **10 marks** **Att 3**

(a) Volume of cylinder = $\pi r^2 h$

$$= 3.14 \times 6^2 \times 8 =$$

$$3.14 \times 36 \times 8 = \mathbf{904.32 \text{ cm}^3}$$

* Accept correct answer with no work

* Accept volume using $\pi = \frac{22}{7}$ (905.1428571)

* Accept answer = 904.7786842 (using π button on calculator)

Blunders (-3)

B1 $r = \text{diameter}$ (use 12 = 3617.28)

B2 Mishandles or ignores r^2 (eg $2r$ for $r^2 = 301.44$)

B3 Fails to substitute for π and continues 288π

B4 Ignores height and continues (113.04)

B5 Volume = $\pi h + B2$ (25.12) + B1

B6 Misplaced decimal

B7 Correct substitution and stops + B2

B8 Volume = $\pi / r^2 h$ ($3.14 \div 288 = .0109027777$)

Slips (-1)

S1 Each numerical error to a max of -3.

S2 Omitted or incorrect units

S3 Truncates answer

Misreadings (-1)

M1 $r = h$ ($3.14 \cdot 8^2 \cdot 8 = 1607.68$) or ($3.14 \cdot 8^2 \cdot 6 = 1205.76$)

Attempts (3)

A1 Only one substitution correct or incorrect and stops

A2 Adds the dimensions only.

Part (b)

5 marks

Att 2

Calculate the volume of the hemisphere, taking $\pi = 3.14$

(b)

5 marks

Att 2

(b)	Volume of a Sphere = $\frac{4}{3}\pi r^3$	or	Volume of Hemisphere $\frac{2}{3}\pi r^3$
	$\frac{4}{3}(3.149)(6^3)$		$\frac{2}{3}(3.14)(6^3)$
	$\frac{4}{3}(3.14)(216)$		$\frac{2}{3}(3.14)(216)$
	$\frac{4}{3} 678.24$		$\frac{2}{3} 678.24$
	904.32		
(Hemisphere $\div 2$)	452.16 cm³		452.16 cm³

* Accept correct answer without work

*Accept volume using $\pi = \frac{22}{7}$ (452.5714268)

*Accept answer = 452.3893421 (using π button on calculator)

Blunders(-3)

B1 Finds volume of sphere (904.32)

B2 Mishandles or ignores fraction (e.g. $3.14 \times 6^3 = 678.24$)

B3 Mishandles r^3

B4 Fails to substitute for π and continues (144 π) (Note answer = 288 π B1+B4)

B5 Misplaced decimal.

B6 $r = \text{Diameter}$ ($\frac{4}{3} \cdot 3.14 \cdot 12^3 = 7004.16$)

Slips(-1)

S1 Each numerical error to a max of -3.

S2 Omitted or incorrect units

S3 Truncates answer

Attempts(2)

A1 Only one substitution correct or incorrect and stops

A2 Adds the dimensions only.

Misreadings (-1)

M1 $r = h$ (1071.78667) $8^3 = 512$

Part (c)

10 marks

Att 3

A rectangular block of wax measuring $14\text{ cm} \times 14\text{ cm} \times 8\text{ cm}$ is melted down to make the candle. Calculate the amount of wax left over

(c)

10 marks

Att 3

(c)

$$14 \times 14 \times 8 = 1568\text{ cm}^3$$

$$\text{Cylinder} + \text{hemisphere} = 904.32 + 452.16 = 1356.48\text{ cm}^3$$

$$1568 - 1356.48 = \mathbf{211.52\text{ cm}^3}$$

*Accept correct answer with no work.

*Accept candidate's answer from part (a) and (b)

Blunders(-3)

B1 Fails to add volume of cylinder and hemisphere

B2 Misplaced decimal

B3 Fails to subtract volume of candle from volume of wax

B4 Answer = $14 \times 14 \times 8 = 1568\text{ cm}^3 + B1 + B3$

Slips(-1)

S1 Each numerical error to a max of -3.

S2 Omitted or incorrect units

S3: Truncates answer

Attempts(3)

A1 Answer = volume of cylinder or hemisphere

Part (d) (i)

15 marks

Att 5

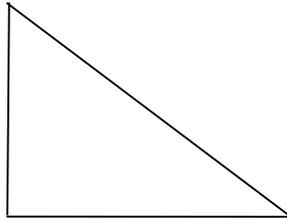
Construct a triangle in which one side is 4 cm, another side is 3 cm and the angle between these two sides is 90°

(d) (i)

15marks

Att 5

(d) (i)



* tolerance ± 0.1 cm

* tolerance $\pm 5^\circ$

Blunders(-3)

B1 Two correct sides drawn only.

B2 Sides outside tolerance of 0.5 cm applied each time

B3 Angle outside tolerance

Slips(-1)

S1 Incorrect units

S2 Each side outside tolerance of 0.1 cm unless B2

Attempts(5)

A1 One side, correct or incorrect, drawn only.

A2 Triangle not drawn with straight edge.

Part (d) (ii) **5 marks** **Att 2**

Measure the length of the third side

(d)(ii) **5 marks** **Att 2**

(d) (ii) **5 cm.**

- * Accept hypotenuse in candidate's diagram
- * Accept correct answer with no diagram
- * Tolerance ± 0.1 cm

Blunders (-3)

B1 Measurement outside tolerance of 0.5 cm, with triangle drawn

Slips(-1)

S1 Side measured between tolerance 0.1 and 0.5 cm.

S2 Incorrect or omitted units

Worthless (0)

W1 Incorrect answer with no diagram or incomplete diagram

W2 Answer = 3 or 4 not relevant to candidate's diagram

Part (e) **5 marks** **Att 2**

(e) Use the measurement of the three sides of your triangle to check the theorem of Pythagoras which states: 'In a right angled triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides'

(e) **5 marks** **Att 2**

(e) $5^2 = 3^2 + 4^2$
 $25 = 9 + 16$
 $25 = 25$

- * Accept candidates answer from part (d)

Blunders(-3)

B1 Maximum error in the application of Pythagoras (e.g. $5^2 + 4^2 = 3^2$)

B2 Correct substitution and stops

B3 $5^2 = 2$ (5) and continues

B4 Misplaced decimal

B5 No hypotenuse $4^2 + 3^2$

Slips(-1)

S1 Each numerical error to a max of -3

S2 Incorrect conclusion e.g. $20 = 25$

Attempts(2)

A1 Constructs a square on one or all sides of the triangle and stops

A2 States that triangle is 3, 4, 5 and Pythagoras works.

A3 States it is true as the triangle is right angled.(accept word 'true' or 'yes')

A4 Correct conclusion no work

QUESTION 3

Part (a)	25(10,10,5) marks	Att (3,3,2)
Part (b)	25(10,10,5) marks	Att (3,3,2)

Part (a) (i) **10 marks** **Att 3**

(a) (i) A die is thrown Write out all the possible outcomes

(a) **10marks** **Att 3**

a (i) 1, 2, 3, 4, 5, 6
--

*Accept correct answer in any order

Blunders(-3)

B1 List evident; each number omitted to a max of -6

B2 Answer = 6 and stops

Attempts(3)

A1 Answer = 1 or 2 or 3 or 4 or 5 only

A2 Answer = $\frac{1}{6}$

Part (a) (ii) **10 marks** **Att 3**

What is the probability of getting a 4?

(a) (ii) **10 marks** **Att 3**

(a) (ii) $\frac{1}{6}$

* Accept answer written as 1:6, 1 in 6, 1 out of 6 or 0.166666666

Blunders(-3)

B1 No fraction or ratio set up.

B2 Answer = 1+ B1.

B3 Answer = 6 + B1.

B4 Answer = $\frac{6}{1}$

B5 Answer = $\frac{4}{6}$

Slips(-1)

S1 Truncates decimal answer.

S2 Answer = 1 to 6 or 1-6

Attempts(3)

A1 Any proper fraction other than $\frac{1}{6}, \frac{6}{1}, \frac{4}{6}$

Worthless (0)

W1 $4 \times 6 = 24$

Part(a) (iii)

5 marks

Att 2

How often would you expect to get a 4 if the die is thrown 300 times?

(a) (iii)

5 marks

Att 2

$$300 \times \frac{1}{6} = \mathbf{50 \text{ times}}$$

* Accept candidate's answer from part a (ii)

* Accept correct answer with no work

Blunders(-3)

B1 Divides by 300

B2 Inverts $\frac{1}{6}$ (1800)

B3 Answer = $300 \times 4 = 1200$

B4 Answer = $300 \div 4 = 75$

Attempt (2)

A1 Answer = $\frac{6}{300}$ or $\frac{300}{6}$

A2 Answer = $\frac{4}{300}$ or $\frac{300}{4}$

Slips(-1)

S1 Each numerical error to a max of -3

Worthless (0)

W1 Answer = 300

W2 Answer = 6 or 4

Part (b) (i)

10 marks

Att 3

Ken wants to calculate his BMI (Body Mass Index).

Ken's height is 1.68 m and his weight is 76.2 kg

Description	BMI
Underweight	< 17.9
Normal	18 to 25
Overweight	25.1 to 29.9
Moderately obese	30 to 40
Severely obese	> 40

(b) (i) Calculate Ken's BMI

$$\text{BMI} = \frac{\text{weight(kg)}}{[\text{height(m)}]^2}$$

(b)

10marks

Att 3

(b)(i)

$$76.2 \div (1.68)^2$$

$$76.2 \div 2.8224$$

$$\mathbf{26.99829932}$$

Blunders(-3)

B1 Ignores or mishandles square (e.g. $76.2 \div 1.68 = 45.35714286$ or e.g. $76.2 \div 2(1.68) = 76.2 \div 3.36 = 22.67857143$)

B2 Inverts height and weight ($1.68 \div 76.2^2 = 1.68 \div 5806.44 = 0.028647431$)

B3 Misplaced decimal

B4 Correct substitution and stops plus B1

Slips(-1)

S1 Each numerical error to a max of -3

S2 Truncates decimal

Attempts(3)

A1 One substitution, correct or incorrect, into the formula and stops.

Part (b) (ii) **10 marks** **Att 3**

Consult the table above to describe Ken's weight

(b) (ii) **10 marks** **Att 3**

(b) (ii) **Overweight**

* Accept candidate's answer from part (b) (i)

Blunders(-3)

B1 Answer = 25.1 to 29.9

B2 Having correctly answered part (b) (i) incorrectly describes Ken's weight

Part (b) (iii) **5 marks** **Att 2**

Calculate the amount of weight that Ken should lose in order to have a BMI reading of 25

(b) (iii) **5 marks** **Att 2**

$(b)(iii) \text{ BMI} = \frac{\text{weight(kg)}}{[\text{height(m)}]^2}$	or	$26.99829932 - 25 = 1.99829932$
$25 = \text{weight} \div (1.68)^2$		$1.99829932 \times (1.68)^2$
$25(2.8224) = \text{weight}$		$1.99829932 \times 2.8224 = \mathbf{5.64 \text{ kg}}$
$2.8224 \times 25 = 70.56 \text{ kg}$		
$76.2 - 70.56 = \mathbf{5.64 \text{ kg.}}$		

* Accept candidates answer with no work

Blunders (-3)

B1 Fails to subtract from 76.2

B2 Divides instead of multiplying

B3 Misplaced decimal

Slips(-1)

S1 Incorrect or omitted units

S2 Each numerical error to a max of -3

Attempts(2)

A1 One substitution, correct or incorrect into formula

A2 Any use of 25

QUESTION 4

Part (a)	25(5,5,5,5,5)marks	Att (2,2,2,2,2)
Part (b)	10 marks	Att 3
Part (c)	5 marks	Att 2
Part (d)	5 marks	Att 2
Part (e)	5 marks	Att 2

The final accounts for a mini-company are shown below

SHARES SUMMARY	Number of Shares issued	<i>Income</i>	<i>Expenditure</i>
EACH STUDENT GETS 12 FREE SHARES	72	€0.00	
EACH STUDENT BUYS A FURTHER 5 SHARES AT A REDUCED COST OF 20 CENT EACH	<input style="width: 50px; height: 20px;" type="text"/>	€6.00	
EACH STUDENT SELLS A FURTHER 5 SHARES AT THE FULL PRICE OF 40 CENT EACH	30	€12.00	
TOTAL SHARES ISSUED	132	<input style="width: 50px; height: 20px;" type="text"/>	
<u>Purchases</u>			
500 BLANK A4 CARDS @ 5 cent each			€ 25.00
INK FOR PRINTER			€31.80
500 ENVELOPES @ 4 cent each			€20.00
TOTAL PURCHASES			€76.80
<u>Sales</u>			
406 CARDS SOLD AT 45 CENT EACH		<input style="width: 50px; height: 20px;" type="text"/>	
TOTAL SALES		<input style="width: 50px; height: 20px;" type="text"/>	
GRAND TOTALS ON 31 MAY 2010		<input style="width: 50px; height: 20px;" type="text"/>	€76.80

Fill in the five missing details on the Final Accounts above

Part (a) (i)

5 marks

Att 2

Each student buys a further 5 shares at a reduced cost of 20 cent each
Number of shares issued

(a)(i)

5 marks

Att 2

(a)(i)

$$\begin{array}{l} \text{€}6.00 \div \text{€}0.20 = 30 \text{ shares} \quad \text{or} \quad 132 - (72 + 30) \quad \text{or} \quad 6 \text{ students} \times 5 = 30 \\ 132 - 102 = 30 \text{ shares} \end{array}$$

*Accept correct answer with no work

Blunders(-3)

B1 Answer = $72 + 30 + 132 = 234$

B2 Answer = $\text{€}6.00 \times .20 = \text{€}1.20$

B3 Misplaced decimal

B4 $\text{€}6.00 \div 72 = 0.0833333$

B5 Answer = $5 \times .20 = \text{€}1.00$

Slips(-1)

S1 Each numerical error to a max of -3

Attempts(2)

A1 Answer = $72 + 30$ (102) and stops

A2 Answer = 12×5 (60) and stops

A3 Answer = 72×5 (360) and stops

A4 Answer = 5 and stops

A5 Answer = $72 \div \text{€}6.00 = 12$

Worthless(0)

W1 Answer = 72 and stops

W2 Answer = 132 and stops

Part (a) (ii) **5 marks** **Att 2**

TOTAL INCOME FROM SHARES ISSUED

(a)(ii) **5 marks** **Att 2**

$$€6.00 + €12.00 = €18.00$$

*Accept correct answer with no work

*Accept answer in cent form but must indicate this

Blunders(-3)

B1: Misplaced decimal.

B2: Each excess amount to a max of -3

B3: Subtracts instead of adds (€6.00)

Slips(-1)

S1: Each numerical error to a max. of -3.

S2: Failure to round or incorrect rounding

Part (a) (iii) **5 marks** **Att 2**

406 CARDS SOLD AT 45 CENT EACH

(a) (iii) **5 marks** **Att 2**

$$(a) (iii) \quad 406 \times .45 = €182.70$$

* Accept correct answer with no work

* Accept answer in cent form but must indicate this

Blunders(-3)

B1 Misplaced decimal.

B2 Divides by 45 (902.2222)

Misreading (-1)

$$M1 \quad 406 \times .54 = €219.24$$

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Failure to round or incorrect rounding.

Attempts(2)

$$A1 \quad \text{Answer} = 406 \pm 45 \quad (451/361)$$

$$A2 \quad \text{Answer} = 406 \times 5 \text{ cent} = €20.30$$

Worthless(0)

$$W1 \quad \text{Answer} = €76.80$$

Part (a)(iv) **5 marks** **Att 2**

TOTAL SALES

(a)(iv) **5 marks** **Att 2**

(a) (iv) **€182.70**

- * Accept correct answer with no work
- * Accept candidate's answer from (a) (iii)

Blunders(-3)

- B1 Each excess amount to a max of -3
- B2 Misplaced decimal

Attempt (2)

- A1 Answer = €12, €6 or €18

Slips(-1)

- S1 Each numerical error to a max. of -3.
- S2 Failure to round or incorrect rounding.
- S3 Answer = €200.70

Part (a) (iv) **5 marks** **Att 2**

GRAND TOTALS ON 31MAY 2010

(a)(v) **5 marks** **Att 2**

(a)(v) €6.00 + €12.00 + €182.70 = **€200.70**

Or €18.00 + €182.70 = €200.70

- * Accept candidate's answer for part (a) (ii) and a (iii) and (iv)
- * Accept correct answer with no work

Blunders(-3)

- B1 Each excess amount to a max of -3
- B2 Subtracts rather than adds (€164.70)
- B3 Misplaced decimal

Slips(-1)

- S1 Each numerical error to a max. of -3.

Attempts(2)

- A1 Answer = €182.70 and stops
- A2 Answer = €18.00 and stops

Worthless (0)

- W1 Answer = €76.80 and stops

Part (b)

10 marks

Att 3

Calculate the total profit of the company on the 31 May 2010, (the final date)

(b)

10 marks

Att 3

$$(b) \quad \text{€}200.70 - \text{€}76.80 = \text{€}123.90 \quad \text{or} \quad \text{€}18.00 + \text{€}182.70 - \text{€}76.80 = \text{€}123.90$$

* Accept correct without work.

* Accept candidate's answer for part (a) (ii) (iii) (iv)

Blunders(-3)

B1 Adds instead of subtracts (277.50)

B2 Answer = €182.70 - 76.80 = €105.90

B3 Each excess deducted to a max of -6

B4 Misplaced decimal

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Failure to round or incorrect rounding.

Attempts(3)

A1 Answer = candidates answer for (a) (v) and stops

A2 Answer = €76.80 and stops

A3 Answer = €18.00 and stops

A4 Answer = €182.70 and stops

A5 Answer = €200.70 and stops

Part (c)

5 marks

Att 2

Calculate the Final Share Value of the company

$$\text{Final Share Value} = \frac{\text{Total profit}}{\text{Total number of shares issued}}$$

(c)

5 marks

Att 2

$$(c) \quad \text{€}123.90 \div 132 = \text{€}0.938636363 \quad \text{€}0.94$$

* Accept correct answer with no work

* Accept answer in cent form but must indicate this

* Accept candidate's answer from part (b)

Blunders(-3)

B1 Misplaced decimal

B2 Inverts (1.065375303)

B3 Each incorrect substitution to a max of -6

B4 Answer = $\frac{123.90}{132}$ and stops

B5 Multiplies instead of divides (16354.8)

Slips(-1)

S1 Each numerical error to a max of -3

S2 Incorrect rounding

Attempt(2)

A1 One substitution correct or incorrect and stops

Part (d)**5 marks****Att 2**

A teacher bought ten shares in the company. Calculate the profit the teacher made.
--

(d)**5 marks****Att 2**

(d)	Cost $10 \times .40 = €4.00$
	Share value 10 shares at €0.94 = €9.40
	Profit $€9.40 - €4.00 = €5.40$

* Accept correct answer with no work

* Accept candidates answer for (c)

Blunders(-3)

B1 Misplaced decimal.

B2 Divides rather than multiplying (apply once only)

B3 Adds rather than subtracts for profit (13.40)

B4 Ignores profit +B3

B5 Incorrect share cost unless S3

Slips(-1)

S1 Each numerical error to a max of -3.

S2 Failure to round or incorrect rounding

S3 Uses 20 cent for share cost

Attempt(2)

A1 Answer = cost of shares only.

A2 Answer = share value only

Part (e)**5 marks****Att 2**

If all the 500 cards were sold calculate the percentage increase in the total profit
--

(e)**5 marks****Att 2**

(e)	$500 \times .45 = €225$	or	$500 - 406 = 94$
	$€225 - €182.70 = €42.30$		$94 \times .45 = 42.30$
	$\frac{42.30}{123.90} \times 100 = \mathbf{34.14043584\%}$		$\frac{42.30}{123.90} \times 100 = \mathbf{34.14043584\%}$

*Accept candidate's answer for part (b)

*Accept correct answer with no work

Blunders(-3)

B1 Inverts fraction

B2 Fails to multiply by 100

Slips(-1)

S1 Truncates decimal answer.

S2 Each numerical error to a max of -3

Attempt(2)

A1 Answer = €42.30

A2 Some work with 100

QUESTION 5

Part (a)	15 marks	Att 5
Part (b)	5 marks	Att 2
Part (c)	30(10,5,5,5,5) marks	Att (3,2,2,2,2)

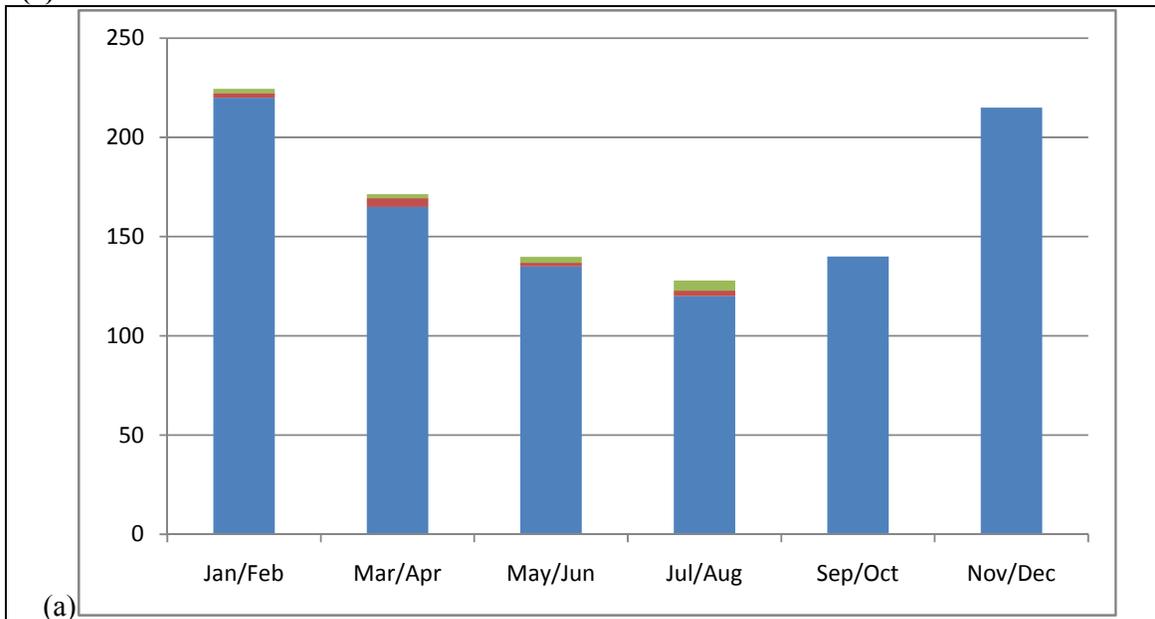
The table below shows successive two-monthly electricity bills for a household over the course of a year, in euro.

Period	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
Bill (€)	220	165	135	120	140	215

Part (a) **15 marks** **Att 5**

Draw a bar chart on the grid below, to illustrate the data

(a) **15 marks** **Att 5**



- * Accept horizontal bar chart
- * Accept candidate's bar chart with bars in different order to the table
- * Tolerance of ± 20 on height of bars from candidate's scale

Blunders(-3)

- B1 Omits a bar to a max of -9
- B2 Each incorrect height according to candidate's scale to a max of -9
- B3 Omits naming months once only

Slips(-1)

- S1 Each incorrect bar width to a max of -3
- S2 Omits label of axis once only
- S3 Incorrect scaling of frequency axis

Misreading (-1)

- M1 Constructs correct trend or pie chart

Attempts(5)

- A1 Draws and labels one or two axes only, correct or incorrect
- A2 Draws bars with no axes

Part (b)

5 marks

Att 2

Calculate the average two-monthly bill, correct to the nearest euro.

(b)

5 marks

Att 2

(b) $220+165+135+120+140+215=995 \div 6 = \text{€}165.8333$ **€166**

* Accept correct with no work.

Blunders(-3)

B1 Multiplies total by 6 (5970)

B2 Total only + B1 (995)

B3 Inverts 995 ($6 \div 995 = 0.00603015$)

B4 Misplaced decimal

Slips(-1)

S1 Each numerical error to a max. of -3.

S2 Failure to round or incorrect rounding.

S3 List evident each bill omitted to a max of -3

Attempts(2)

A1 Any indication of addition

A2 Multiplies one of the amounts by 6.

A3 Answer = 6

A4 Finds median (152.5)

Worthless (0)

W1 Multiplies bill amounts together only

Part (c)

10,5,5,5,5,marks

Att 3,2,2,2,2

Peter works in the local Mantra Supermarket.

He is paid a basic hourly rate of €9.80 for a 37 hour week.

He is paid time and a half for overtime.

(c) Last week Peter worked 40.5 hours.

Fill in the table below to calculate his gross earnings for last week.

Standard Week 37 hrs @ € 9.80	= €	<input type="text"/>
Overtime <input type="text"/> hrs @ € <input type="text"/>	= €	<input type="text"/>
Gross Earnings	= €	<input type="text"/>

(c) (i)

10 marks

Att 3

Standard Week 37 hrs @ €9.80

(c) (i)

10 marks

Att 3

(c) (i) 37 hrs @ €9.80 = **€362.60**

* Accept correct answer with no work

*Accept answer in cent form but must indicate this

Blunders (-3)

B1 Divides rate by the number of hours (3.775510204 or vice versa .264864864)

B2 Misplaced decimal.

Slips (-1)

S1 Each numerical error to a max of -3.

S2 Failure to round or incorrect rounding

Attempt (3)

A1 Answer = 37 ± 9.80 (46.80/27.20)

Part (c) (ii) **5 marks** **Att 2**

Calculate overtime hours

(c) (ii) **5 marks** **Att 2**

(c) (ii) $40.5 - 37 = 3.5$ hours

* Accept correct answer in minutes 210 min

Blunders (-3)

B1 Adds instead of subtracts (77.5)

B2 1 hour = 100 minutes

Attempt (2)

A1 Answer = 40.5 or 37

Part (c) (iii) **5 marks** **Att 2**

Overtime rate (time and a half)

(c) (iii) **5 marks** **Att 2**

(c) (iii) $€9.80 \div 2 = €4.90$ so $€9.80 + €4.90 = €14.70$

Or $€9.80 \times 1.5 = €14.70$

* Accept correct answer with no work

Blunders (-3)

B1 Fails to calculate the overtime rate correctly

B2 Misplaced decimal

Slips (-1)

S1 Failure to round or incorrect rounding

S2 Each numerical error to a max of -3

Attempt (2)

A1 Answer = €4.90

A2 Answer = €19.60 (double time)

Worthless (0)

W1 Answer = €9.80

Part (c) (iv)

5 marks

Att 2

Overtime 3.5 hours @ €14.70

(c) (iv)

5 marks

Att 2

(c) (iv)

3.5 hours @ €14.70 = **€51.45**

* Accept correct answer with no work

* Accept candidate's answer from part (ii) and (iii)

Blunders(-3)

B1 Divides instead of multiplies ($14.70 \div 3.5 = €4.20$ or $3.5 \div 14.70 = 0.238095238$)

B2 Misplaced decimal

B3 Answer = $40.5 \times 14.70 = €595.35$

Slips(-1)

S1 Failure to round or incorrect rounding

S2 Each numerical error to a max of -3

Attempts (2)

A1 Adds or subtracts ($18.20/11.20$)

Worthless (0)

W1 Answer = €9.80, 3.5, 37, 40.5, 14.70

Part (c) (v)

5 marks

Att 2

GROSS EARNINGS

(c)(v)

5 marks

Att 2

(c)(v)

$$€362.60 + €51.45 = \mathbf{€414.05}$$

* Accept correct answer with no work

* Accept candidate's answer from part (i) and (iv)

Blunders(-3)

B1 Each excess amount added

B2 Subtracts instead of adds (311.15)

B3 Misplaced decimal

Slips(-1)

S1 Failure to round or incorrect rounding

S2 Each numerical error to a max of -3