Coimisiún na Scrúduithe Stáit

State Examinations Commission

LEAVING CERTIFICATE APPLIED

2011

MARKING SCHEME

MATHEMATICAL APPLICATIONS

COMMON LEVEL

MARKING SCHEME
LEAVING CERTIFICATE APPLIED 2011

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**

Find $\sqrt{119}$, correct to 2 decimal places.

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

(a) $\sqrt{119} = 10{\cdot}90871211$
$= 10{\cdot}91$

*Accept correct answer with no work

Blunders(-3)
B1: Answer = $(119)^2 = 14161$.
B2: Answer = $119 \div 2 = 59{\cdot}5$
B3: Misplaced decimal.

Slips (-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempts(2)
A1: $119 \times 2 = 238$

Worthless (0)
W1: Answer = $119 \pm 2 = 121/117$

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

John scored a goal after 83 minutes of a game which started at 14:45. At what time did John score the goal?

(b)	**5 marks**	**Att 2**
(b)	14:45 + 83 min = 16:08 or 4:08 pm	Accept 16:23 - allows 15 min for half time

* Accept correct answer with no work.

Blunders (-3)
B1: 1 hour = 100 minutes (15:28)
B2: Subtracts 83 minutes (13:22 or if using 1hr =100 min 13·62 +B1)
B3: Misplaced decimal

Slips (-1)
S1: Each numerical error to a max of –3.
S2: Incorrect or omitted units

Attempts (2)
A1: Any time, not mentioned above, past 14:45

Worthless (0)
W1: Multiplies 14:45 by 83 = 1199·35

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

The length of a side of a square is 4·5 cm.
Calculate the area of the square.

(c)	**5marks**	**Att 2**
(c)	4·5 cm ×4·5 cm = 20·25 cm^2	

* Accept correct answer with no work.

Blunders (-3)
B1: Incorrect length or width
B2: Answer = 4·5×4·5 and stops + possible S2
B3: Misplaced decimal
B4: Calculates perimeter (4·5×4= 18)

Slips (-1)
S1: Each numerical error to a max. of -3
S2: Incorrect or omitted units

Attempts (2)
A1: Answer = 4·5 + 4·5 = 9
A2: Answer = √4.5 =2·121320344

Worthless (0)
W1: 4·5 ÷ 4·5 = 1

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

Two friends shared a Lotto prize of €24 000 in the ratio 4:1.
How much did each person receive?

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

(d) $€24\,000 \times \frac{4}{5} = €19\,200$

$€24\,000 \times \frac{1}{5} = €\ 4\,800$

or $€24\,000 - €19\,200 = €\ 4800$

* Accept correct answer with no work.

Blunders(-3)
B1: Misplaced decimal.
B2: Inverts 5/4 (30 000)
B3: Answer = 24 000 × 4 = 96 000 and stops
B4: Answer = 24 000 ÷ 4 = 6000 and stops

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Calculates 1/5 only (4 800) or 4/5 only (19 200)

Attempts(2)
A1: Answer = 4+1 = 5 and stops
A2: Answer = 24 000 ÷ 4·1 = 5853·658537
A3: Answer = 24000×4·1 = 98 400

Worthless (0)
W1: 24 000 ± 1 or 24 000± 4
W2: Answer = 4 or 1

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

Calculate $\frac{3}{4}$ of 72 .

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

(e) $\frac{3}{4}$ of 72 = 54

* Accept correct answer with no work

Blunders(-3)
B1: Inverts ¾ (96)
B2: Misplaced decimal.
B3: Inverts 72 (0·010416666)
B4: Divides by 3 and stops (24)
B5: Answer = 72 × 3 = 216 and stops or 72 × 4 = 288
B6: Calculates ¼ only (18)

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempt (2)
A1: 72 ± ¾
A2: 75%

(f) **5 marks** **Att 2**

A jacket costing €96·00 is reduced by 10% in a sale.
What is the sale price?

(f) **5marks** **Att 2**

(f) €96·00 × 10% = € 9.60
Sale price = €96.00 - €9.60 = €86·40 or €96 ×90%= €86·40

* Accept correct answer with no work

Blunders(-3)
B1: Inverts €96 (0·104166666)
B2: Misplaced decimal.
B3: Inverts 10%

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Answer = €9·60 and stops + S4
S4: Calculates 110% (€105·60)

Attempts(2)
A1: Answer = €96± 10

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

Mary got a loan of €100. She had to pay €10 each month for a year to clear the loan. How much did the loan cost her?

(g) **5marks** **Att 2**

(g) €10 × 12 = €120 Accept €20

* Accept correct answer with no work.

Blunders(-3)
B1: Year not equal to 12 months
B2: Misplaced decimal

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Answer = €220
Attempts(2)
A1: Answer = 100÷12=8·3333333

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

Add 340 g, 2 kg and 23 g.
Give your answer in grammes.

(h) **5marks** **Att 2**

(h) 340 g + 2000 g = 23 g = 2363 grammes

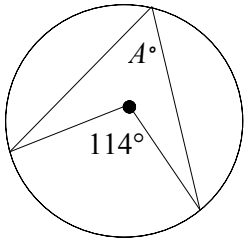
* Accept correct answer with no work

Blunders(-3)
B1: Incorrect conversion
B2: Misplaced decimal

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Incorrect or omitted units
S4: Answer = 2·363 kg

Attempts(2)
A1: Answer = 340+2+23=365

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



Calculate *A*.

(i) **5marks** **Att 2**

(i) $114° \div 2 = 57°$

* Accept correct answer with no work.

Blunders(-3)
B1: Answer = 114×2=228º
B2: Misplaced decimal

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Incorrect or omitted units (degree sign)
S3: Applied incorrect geometric relationship (180º- 114º =66º or 360º-114º = 246º)

Attempts(2)
A1: Answer = 90º or 180º or 360º without work
A2: Measures and uses any one angle (21/59/19) from diagram

Worthless (0)
W1: Answer = 114º and stops

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

The average of four numbers is 22. A fifth number, 12, is then added on.
Calculate the new average.

(j) **5marks** **Att 2**

(j)

$$\frac{\text{sum of 4 numbers}}{4} = 22 \Rightarrow \text{sum of 4 numbers} = 88$$

$$\frac{88+12}{5} = \frac{100}{5} = 20$$

* Accept correct answer with no work.

Blunders(-3)
B1: Answer = 88 and stops
B2: Misplaced decimal.
B3: Fails to add 12 (88÷5=17·6)
B4: Omission of division by 5 (100)

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempts(2)
A1: Answer = 22 +12 =34 and stops or 34÷ 5= 6·8
A2: Answer = 22÷4 =5·5 +12 = 17·5
A3: Answer = 4+5+12+22÷4 = 10·75

QUESTION 2

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

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

Complete the frequency table by working out how many times a  was thrown.

(a)	**10 marks**	**Att3**

(a) 54 - (9 + 7 + 11 + 10 + 9) = 54 – 46 = 8 times

* Accept correct answer with no work

Blunders(-3)
B1: Fails to subtract from 54 (46)
B2: Misplaced decimal.

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: List evident ….each frequency omitted to a max of -3

Attempts(3)
A1: Any indication of addition
A2: Finds average, correct or incorrect, 54÷ 6= 9 or
$9\times1 + 7\times2 + 11\times 3+10\times4 +9\times6 = 150 \div 46 = 3{\cdot}260869$

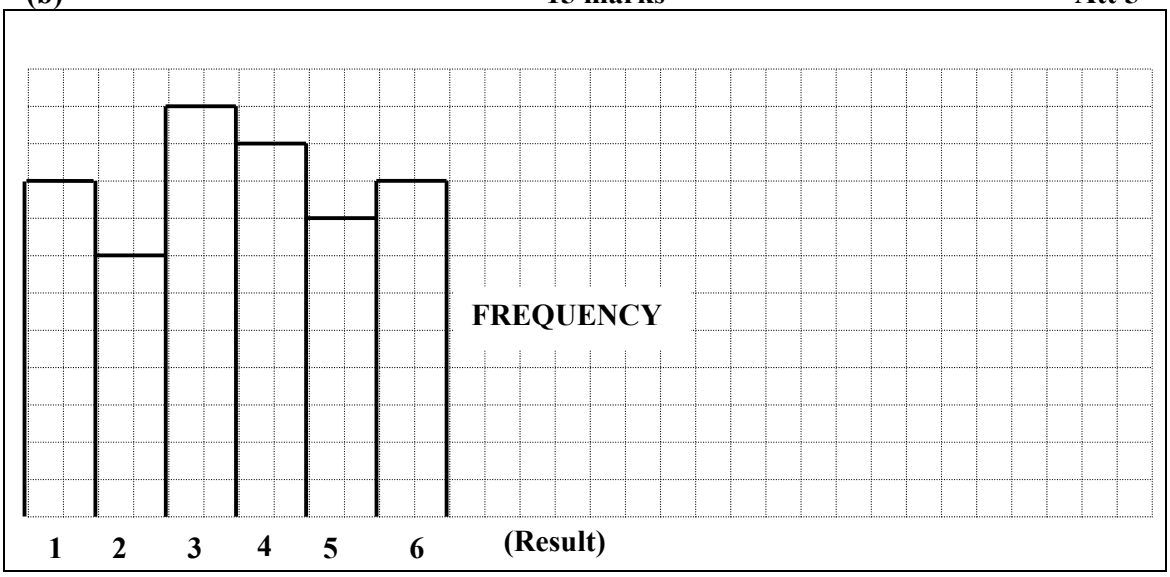
Worthless (0)
W1: Answer = 5

Note: If part (a) blank but correct height drawn in bar chart in part (b) award 10 marks for part (a)

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

(b) Draw a bar chart to illustrate the above data. Use the grid below to draw your bar chart.

(b) **15 marks** **Att 5**



*Accept horizontal bar chart
*Accept candidate's bar chart with bars in different order to the table
*Accept candidate's answer from part (a)

Blunders(-3)
B1: Omits a bar to a max of -9
B2: Each incorrect height according to the candidate's scale to a max of -9
B3: Numbers on frequency axis not in ascending order + S2

Slips(-1)
S1: Each incorrect bar width to a max of -3
S2: Incorrect scaling of frequency axis
S3: Omits labelling axes once only
S4: Incorrect scaling of result 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 (c) **5 marks** **Att 2**

Write down the modal throw.

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

(c) 3

* Accept correct answer with no work.

Blunders(-3)
B1: Answer = 11

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempts(2)
A1: Calculates the mean of the frequency table correct or incorrect
(9×1 + 7×2 + 11× 3+10×4 +8×5+9×6 = 190 ÷54 = 3·518519)
A2: Finds mode = 9 (7,8,9,9,10,11)

Part (d) **(5,10)marks** **Att 2, 3**

(d)*(i)* What is the probability that Sheila picks a red bead?

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

(d)(*i*) $\frac{2}{9}$

* Accept answer written as 2:9, 2 in 9, 2 out of 9, or ·2222222 or 22.22222%.

Blunders(-3)
B1: No fraction or ratio set up
B2: Answer = 2 +B1
B3: Answer = 9 +B1
B4: Answer = 9/2
B5: Answer = 2 to 9
B6: Answer = 1/9

Slips(-1)
S1: Answer = 3/9 or 4/9
S2: Answer = 7/9
S2: Answer in truncated decimal

Attempts(2)
A1: Any other proper fraction other than 2/9, 9/2, 1/9,7/9,3/9,4/9
A2: Answer = 2-9

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

(d)(ii) Sheila wants each colour to have the same probability of being picked.
She wants to keep the total number of beads the same.
How many of each colour should she have in the bag?

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

(d)(*ii*) 3 of each colour

Blunders(-3)
B1: Answer = 9
B2: Answer = the same amount/equal amount of each colour
Slips(-1)
S1: Each numerical error to a max. of –3.
Attempts(3)
A1: Answer = 4×3×2=24

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

A number of four legged stools and three legged stools together have a total of 20 legs. Calculate the number of three-legged stools.

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

(e) If number of 3 legged stools = 1
=> number of legs left for 4 legged stools = 20 -3 = 17 ..impossible as 17 ÷ 4 , same is true for number of three legged stools = 2 or 3
If the number of 3 legged stools = 4 => number of legs left for 4 legged stools = 20 – (3×4) = 8 and 8 is a multiple of 4, so 2, 4 legged stools
Answer = **4** three legged stools

* Accept correct answer with no work

Blunders(-3)
B1: 20 ÷4=5 or 20÷3=6·6666667
B2: Misplaced decimal.
B3: Answer = 20 ÷ 4+3 = 2·8571… or 2 6/7
B4 Answer = No three legged stools

Slips(-1)
S1: Each numerical error to a max. of –3.

Attempts(3)
A1: Answer = Attempt at grid, drawing stools or counting

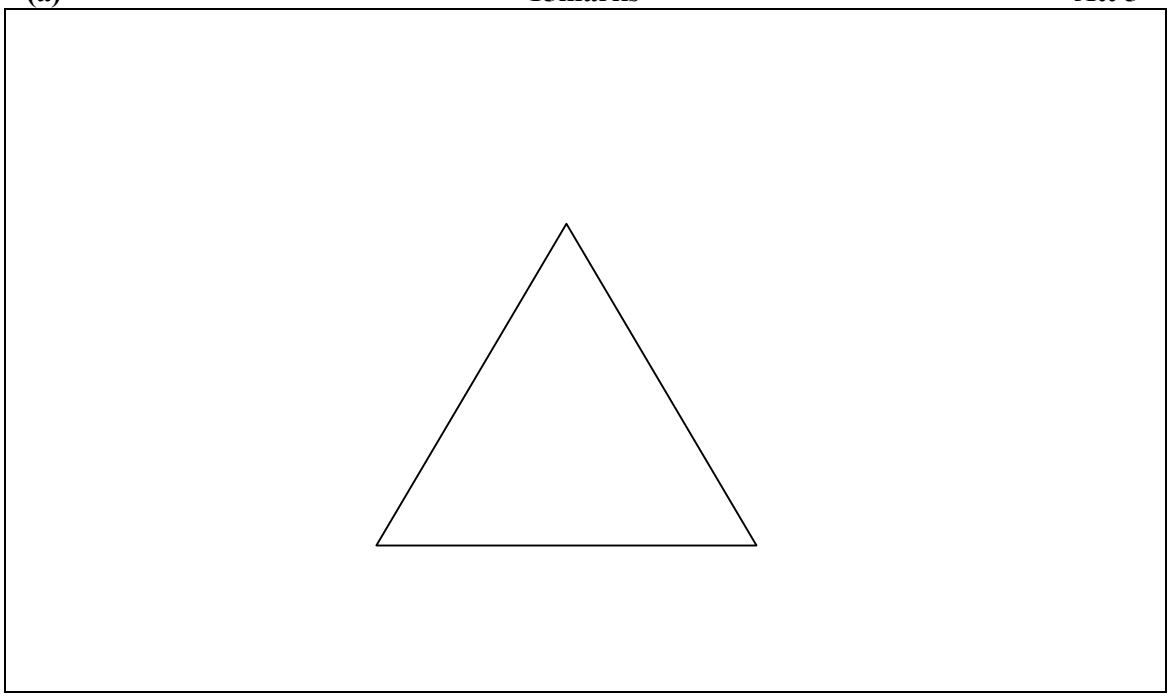
QUESTION 3

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

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

(a) In the box below, construct a triangle with all sides measuring 5 cm.

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



* Tolerance ± 0.1 cm
* Tolerance ± 5º

Blunders(-3)
B1: Two correct sides drawn only
B2: Sides outside the tolerance of 0·5 cm applied each time
B3: Angle outside tolerance once only

Slips(-1)
S1: Incorrect units
S2: Each side outside tolerance of 0·1 unless B2

Attempts(5)
A1: One side, correct or incorrect, drawn only.
A2: Triangle not drawn with straight edge.

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

Calculate the perimeter of the triangle.

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

(b) 5 cm + 5 cm + 5 cm = 15 cm

* Accept correct answer with no work
* Accept candidate's answer from part (a)
* Tolerance ± 0.1 cm

Blunders(-3)
B1: Calculates area (1/2. 2·5.4.333 = 5·4125 cm²)
B2: Misplaced decimal.
B3: Answer = 5+5+5 and stops
B4: Answer = 5+3 =8
B5: Answer = 1/2 .5.5 = 12·5 cm
B6: Answer = 5×5×5 = 125

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Incorrect or omitted units (cm)

Attempts (2)
A1: Any use of 5 not covered above

Worthless (0)
W1: Answer = 5 and stops

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

(c) Measure any one of the angles in the triangle in part ***(a)***. Write down your answer

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

(c) angle = 60°

* Accept candidate's answer for parts (a)
* Tolerance ± 5º

Blunders (-3)
B1: Angle outside tolerance
Slips (-1)
S1: Each numerical error to a max. of –3.
S2: Incorrect or omitted units (degrees º)

Attempts(2)
A1: Answer = 180º and stops

Worthless (0)
W1: Measures a side length

Part (d) **(10,10,5) marks** **Att(3,3,2)**

(d)(i) What are the actual measurements of the floor?

(d)(i) **10 marks** **Att 3**

(d) (i) Length = 30 cm × 20 = 600 cm = 6 m
Width = 20 cm × 20 = 400 cm = 4 m

* Accept correct answer with no work
* Accept answer in cm or m

Blunders(-3)
B1: Divides by 20
B2: Misplaced decimal once only
B3: 1 metre ≠ 100 cm
B4: Correct answer for length or width only
B5: Uses 120 × 30= 3600 or 120 × 20 = 2400 + B4
B6: Uses 1·20 × 30 =36 or 1·20 × 20 = 24 +B4

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Incorrect or omitted units once only
S4: Answer = 1000cm or 10m

Attempts(3)
A1: Answer length = 31 (30+1) or width = 40 (20 +20)

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

(d)(ii) Siobhan is going to use square tiles to cover the floor.
Each tile measures 0·25 m × 0·25 m.
How many tiles are needed to cover the floor completely?

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

(d)(ii) Floor area = 6 m× 4 m = 24 m^2
Tile area = 0·25 m × 0·25 m = 0·0625 m^2
Number of tiles needed = 24 ÷ 0·0625 = 384 tiles
or 600× 400 = 240000÷ 25 × 25 =625 = 384 tiles

* Accept candidate's answer from d (i)

Blunders(-3)
B1: Incorrect conversion
B2: Misplaced decimal.
B3: Fails to divide floor area by tile area having calculated both correctly

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempts(3)
A1: Answer = Area of tile only 0·25× 0·25 = ·0625
A2: Answer = Area of floor only 6×4 = 24 or 600×400 = 240 000

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

There are 18 tiles in a box. Each box costs €15·99.
Calculate the cost of the tiles.

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

(d)(iii) Number of boxes = 384 ÷ 18 = 21·333333= 22 full boxes
22 × €15.99 = €351·78.

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

Blunders(-3)
B1: Fails to round to full box (Uses 21·33 ×€15·99 = €341·12)
B2: Misplaced decimal.
B3: Mishandles 18
B4: Mishandles €15·99

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempts(2)
A1: Answer = 18×€15·99= €287·82
A2: Answer = 18 ÷ €15·99 = 1·15703565
A3: Answer = €15·99÷ 18 = 0·888333

QUESTION 4

Part (a)	**10 marks**	**Att 3**
Part (b)	**10 marks**	**Att 3**
Part (c)	**10 marks**	**Att 3**
Part (d)	**10 marks**	**Att 3**
Part (e)	**10 marks**	**Att 3**

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

Find the initial monthly repayment on a loan of €3000 which is to be repaid over 5 years at a variable rate.

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

(a) €23·35 ×3 = €70·05

Blunders(-3)
B1: Chooses 1 year or 2 year repayment plan
B2: Misplaced decimal.
B3: Fails to multiply by 3 (€23·35)
B4: Chooses fixed rate column

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Chooses €5000 up to €10 000 row

Attempts(3)
A1: Answer = €3000 ÷ 5= 600 ÷ 12 = €50
A2: Answer = €3000÷ 60 = €50
A3: Answer = €3000@ 5% = €150
A4: Answer = €23·35 × 60 = €1401

Worthless(0)
W1: Answer = €3000×5 = €15 000
W2: Answer = 3000 ÷ 5 = 600

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

If the €3000 were to be borrowed over 2 years at a variable rate, what would be the difference in the initial monthly repayment?

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

(b) €47·67 × 3 = €143·01
Difference = €143·01 - €70·05
= €72·96

or

€47·67 - €23·35 = €24·32
€ 24·32× 3 = €72·96

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

Blunders(-3)
B1: Chooses 1 year or 5 year repayment plan
B2: Misplaced decimal.
B3: Adds instead of subtracts
B4:Fails to multiply by 3
B5: Chooses fixed rate
B6: Fails to find difference

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Uses €5000 to €10 000 row

Attempts(3)
A1: Answer = 3000÷24 (2 years) = €125

Worthless (0)
W1: Answer = €3000 ÷ 2 = €1500

Part (c) **10 marks** **Att 3**

John borrows €7000 to buy a car. He will repay the loan over 2 years at the fixed rate. How much does the loan cost John?

(c) **10 marks** **Att 3**

(c) €47·48 × 7 ×24 = €7976·64

* Accept correct answer with no work
* Accept €976·64

Blunders(-3)
B1: Chooses 1 year or 5 year repayment plan
B2: Misplaced decimal.
B3: Fails to multiply by 7 (€47·48 × 24 =€1139·52)
B4: Mishandles the 2 years (24 monthly repayments)
B5: Chooses variable rate

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Uses €1000 to €5000 row

Attempts(3)
A1: Answer = €7000÷ 24= €291·6666667

Worthless (0)
W1: Answer = €7000 ÷ 2 = €3500

Part (d) **10 marks** **Att 3**

John's car, now worth €7000, will depreciate by 14% per year.
Calculate the value of the car after one year.

(d) **10 marks** **Att 3**

(d) €7000 × 14% = €980
Value of car after 1 year = €7000 - €980 = €6020.

* Accept correct answer with no work

Blunders(-3)
B1: Inverts €7000
B2: Misplaced decimal.
B3: Inverts 14%

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Answer = €980 and stops + S4
S4: Calculates 114% (€7980)

Attempts(3)
A1: Answer = €7000± 14 and stops
A2: €7000 decreased by any number not covered above.

Part (e) **10 marks** **Att 3**

Find the maximum loan that Caoimhe can get if she
can only afford to repay €115 per month over five years.

(e) **10 marks** **Att 3**

(e) €115 ÷ €22·95 = 5.0108932 thousands
= 5.0108932 × 1000
Max. loan = €5010·89

Blunders(-3)
B1: Chooses 1 year or 2 year repayment plan
B2: Misplaced decimal.
B3: Fails to divide
B4: Fails to × 1000
Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Chooses another monthly payment from 5 year plan
Attempts(3)
A1: Answer = €115÷ 60 = 1·916666667
A2: Answer = loan from €5000 to €10 000
A3: Answer = 115 × 60 = €6900
A4: Answer = any amount between €5000 and €10 000
A5: Chooses any of the 5 year repayment plan and stops
Worthless(0)
W1: Answer = €115 ÷ 5 =23

QUESTION 5

Part (a)	**10 marks**	**Att 3**
Part (b)	**10marks**	**Att 3**
Part (c)	**5 marks**	**Att 2**
Part (d)	**10marks**	**Att 3**
Part (e)	**10 marks**	**Att 3**
Part (f)	**5 marks**	**Att 2**

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

Denis travelled from Cork to Dublin and on to Galway.
How many kilometres did he travel?

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

(a) 256 km + 216 km = 472 km

* Accept correct answer with no work.

Blunders(-3)
B1: Uses 207 or 422 or 167 as distance
B2: Uses 300 as a distance
B3: Having correctly found both distances fails to total
B4: Each excess distance added
B5: Misplaced decimal

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Incorrect or omitted units (km)
S4: Answer = 944 return journey
S5: Answer = 216 + 207 = 423 (Cork to Galway to Dublin)

Attempts(3)
A1: Answer = 256 or 216

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

It took Denis 7 hours and 20 minutes to make this journey.
Calculate his average speed.

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

(b) $\text{Speed} = \dfrac{\text{Distance}}{\text{Time}}$

$\dfrac{472 \text{ km}}{7 \text{ hrs } 20 \text{ min}} = 64.363636 \text{ km / h}$

* Accept correct answer with no work.
* Accept candidate's answer for part (a)
* Accept answer 1·0727272 km/min.

Blunders(-3)
B1: Correct substitution and stops+ possible B4 + S3
B2: Misplaced decimal.
B3: Each incorrect substitution unless B6
B4: I hour = 100 minutes (65·55555556)
B5: 472× 7hr 20 =3398·4
B6: Inverts 472/7hrs 20 and continues (0·015254237) + B4 + possible S3

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Truncates decimal answer
S3: Incorrect or omitted units (km/hr)

Attempts(3)
A1: One substitution, correct or incorrect

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

Denis receives travelling expenses of 57 cent per kilometre.
Calculate his travelling expenses for the journey in part ***(a)*** above.

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

(c) 472× 57 c = €269·04

* Accept correct answer with no work
* Accept candidate's answer from part (a)
*Accept answer in cent form but must indicate this

Blunders(-3)
B1: Uses answer from part (b) (64·363636 × 57 = 3·62727 = €3·63)
B2: Misplaced decimal.

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempts(2)
A1: Answer = 472± 57 (529/415)

Part (d) **10 marks** **Att 3**

Calculate Séan gross pay.

(d) **10 marks** **Att 3**

(d) Gross pay =(€9·40 × 35) + (€11·30 × 5)
= €329 + €56·50
= €385·50

* Accept correct answer with no work

Blunders(-3)

B1: Fails to calculate 5 remaining hours
B2: Misplaced decimal.
B3: Divides rate by number of hours
B4: Having correctly calculated hourly total fails to add for gross total
B5: Uses 9·40 rate for all hours (40×9·40= 376 or 35 × 9·40 = 329) + B1
B6: Uses 11·30 rate for all hours (40× 11·30 = 452 or 35 × 11·30 = 395·50) + B1
B7: Subtracts instead of adds when totaling (272·50)

Slips(-1)

S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempts(3)

A1: Answer = €9·40 + €11·30 = €20·70 and stops or €20·70× 40 = €828
A2: Answer = €20·70 × 35 = €724·50

Part (e) **10 marks** **Att 3**

Séan's tax rate was 20% and he had tax credits of €56 per week.
Calculate the tax paid by Séan.

(e) **10 marks** **Att 3**

(e) €385·50 ×20% = €77.10 - €56 = €21·10 = Tax

* Accept candidate's answer for part (d)

Blunders(-3)

B1: Inverts 20%
B2: Misplaced decimal.
B3: Incorrect order (385·50 – 56) × 20% = €329·5@20% = €65·90
B4: Mishandles tax credits
B5: Answer = €77·10

Slips(-1)

S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding
S3: Calculates net pay (€364·40)

Attempts(3)

A1: Answer = €385·50± 56 and stops
A2: Answer = €385·50 × 20% and stops
A3: Answer = 56 × 20% and stops (11·20)
A4: Answer = 56 × 100 ÷ 20 = €280

Part (f)	**5 marks**	**Att 2**
Calculate Séan's take home pay for that week.		

(f)	**5 marks**	**Att 2**
(f) Take home pay €385·50 - €21·10 = €364·40		

* Accept candidate's answer for part (d) and part (e)

Blunders(-3)
B1: Adds rather than subtracts tax (385·50 + 21·10 = 406·60)
B2: Misplaced decimal.

Slips(-1)
S1: Each numerical error to a max. of –3.
S2: Failure to round or incorrect rounding

Attempts(2)
A1: Answer = €385·50 answer from part (d)
A2: Answer = €21·10 answer from part (e)