Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2014

Marking Scheme

Mathematical Applications

Common Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

Contents   *Page*

Structure of the marking scheme

Candidate responses are marked according to different scales, depending on the types of response anticipated. Scales labelled A divide candidate responses into two categories (correct and incorrect). Scales labelled B divide responses into three categories (correct, partially correct, and incorrect), and so on. The scales and the marks that they generate are summarised in this table:

Scale label	A	B	C	D
No of categories	2	3	4	5
5-mark scale	0, 5	0, 3, 5	0, 2, 3, 5	
10-mark scale	0, 10	0, 5, 10	0, 3, 7, 10	
15-mark scale				0, 4, 7, 11, 15

A general descriptor of each point on each scale is given below. More specific directions in relation to interpreting the scales in the context of each question are given in the scheme, where necessary.

Marking scales – level descriptors

A-scales (two categories)
- incorrect response (no credit)
- correct response (full credit)

B-scales (three categories)
- response of no substantial merit (no credit)
- partially correct response (partial credit)
- correct response (full credit)

C-scales (four categories)
- response of no substantial merit (no credit)
- response with some merit (low partial credit)
- almost correct response (high partial credit)
- correct response (full credit)

D-scales (five categories)
- response of no substantial merit (no credit)
- response with some merit (low partial credit)
- response about half-right (middle partial credit)
- almost correct response (high partial credit)
- correct response (full credit)

In certain cases, typically involving incorrect rounding, omission of units, or a misreading that does not oversimplify the work, a mark that is one mark below the full-credit mark may be awarded. Such cases are flagged with an asterisk. Thus, for example, Scale 10C* indicates that 9 marks may be awarded. The * is not applied for a missing euro symbol, unless otherwise specified.

Summary of mark allocations and scales to be applied

Question 1 (50)

(a)	5B*
(b)	5B
(c)	5B*
(d)	5B*
(e)	5B*
(f)	5B*
(g)	5B
(h)	5B*
(i)	5B*
(j)	5B

Question 2 (50)

(a)	10C, 5B
(b)	5B, 5B, 5B
(c)	5B, 5B
(d)	10C

Question 3 (50)

(a)	15D
(b)	10B*
(c)	5C
(d)(i)	10B*
(d)(ii)	5C
(d)(iii)	5C

Question 4 (50)

(a)	5B
(b)	5C
(c)	5C
(d)(i)	10C
(d)(ii)	10C*
(e)	10C
(f)	5C

Question 5 (50)

(a)	10C*, 5C*, 5C*
(b)	5B*, 5B*, 5B*, 10B*
(c)	5B

Solutions and detailed marking notes

QUESTION 1

(a)   **Scale 5B***   **(0, 3, 5)**

Find 13·5% of €168.

$$€168 \times \frac{13 \cdot 5}{100} = €22 \cdot 68$$

** Accept correct answer with no work.
** Accept answer in cent form, but must indicate this.

* Failure to round or incorrect rounding.

Partial Credit
- Evaluates 113·5% (€190.68)
- Calculates 86·5% (€145.32)
- Inverts 13·5% (€1244·44)
- Inverts €168 (€0·000803)
- Misplaced decimal.
- Answer = 13·5±168. (€181.5/€154.5)
- Any use of 100

(b)   **Scale 5B**   **(0, 3, 5)**

In a season, Jim scores 9 tries and 24 penalties.
A try is worth 5 points and a penalty is worth 3 points.
Find the total number of points Jim scores in this season.

Total score = (9×5) + (24×3)
            = 45 + 72
            = 117 points

** Accept correct answer with no work.

Misreading (Full Credit –1)
- Uses try = 3 points and penalty = 5 points and continues
  (9 × 3 = 27; 24 × 5 = 120; 27 + 120 = 147)

Partial Credit
- Subtracts instead of adds (72 – 45 = 27)
- Calculates try points only (45) or penalty points only (72)
- Answer = 5 + 3 = 8 only
- Answer = 41 (9+5+24+3)

No Credit
- Answer = 9 + 24 = 33 points

(c)   **Scale 5B***   **(0, 3, 5)**

> A rectangle is 20 m long and 35 m wide
> Find the length of the perimeter of the rectangle.

> Perimeter = 20 m + 20 m + 35 m + 35 m = 110 m
> Or: 20 × 2 = 40; 35 × 2 = 70; 40 + 70 = 110 m

** Accept correct answer with no work.

* Incorrect or omitted units.

Partial Credit
- Answer = 55 m and stops
- Omits one side (75m or 90m)
- Answer = 40 m and stops
- Answer = 70 m and stops
- Calculates area (20 × 35 = 700)

No Credit
- Answer = 35 ÷ 20 = 1·75
- Answer = 20 ÷ 35 = 0·5714285

(d)   **Scale 5B***   **(0, 3, 5)**

> A car travels 80 km in 1 hour and 20 minutes.
> Find the average speed of the car.

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{80}{\left(1\frac{1}{3}\right)} = 60 \text{ km/hour}$$

** Accept correct answer with no work.
**Accept 1km/minute.

* Incorrect or omitted units.

Partial Credit
- Answer = 80 × 1·33333333 = 106·6666666km/hr
- Inverts $\dfrac{80}{1·3333}$ and continues (0·0166666666625)
- Uses 1·2 for 1 hour and 20 mins (66·666666666667)
- Misplaced decimal
- One substitution, correct or incorrect
  (e.g. 80 ÷ (60 + 20) = 80 ÷ 80 = 1; or 80 ÷ 120 = 2/3; or 120 ÷ 80 = 1·5)
- 80 ± 1·3333333 = 81·333333 or 78·66666667
- Mishandles fraction button on calculator (240km/hr)

(e) **Scale 5B*** **(0, 3, 5)**

Given an exchange rate of €1 = $1·3523 US dollars, convert €250 to dollars.

€250 × 1·3523 = $338·075 = $338·08 US dollars

** Accept correct answer with no work.

* Failure to round or incorrect rounding.
* € used instead of $. Do not apply * if no sign is used.

Partial Credit
- Divides by 1·3523 (184·87)
- Inverts €250 (0·0054092)
- Misplaced decimal
- Answer = €250 ± 1·3523 = 251·3523 or 248·6477

No Credit
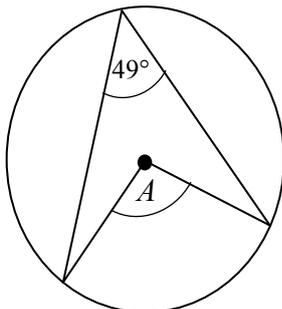- Answer = €250 or 1·3523

(f) **Scale 5B*** **(0, 3, 5)**

Find the value of *A*.

$A = 49° × 2 = 98°$

** Accept correct answer with no work.

* Incorrect or omitted units.

Partial Credit
- 49° ÷ 2 = 24·5°
- Answer = 90° or 180° or 360° without work
- Applied incorrect geometric relationship
  (180 – 49° = 131°; or 360° – 49° = 311°; or 90° – 49 = 41°)
- Measures angle with a protractor (102°)

No Credit
- Answer = 49° and stops

(g)   **Scale 5B**   **(0, 3, 5)**

Write the number 16 666 to the nearest thousand.

17 000

** Accept correct answer with no work.
** Accept 17.

Partial Credit

- Answer corrected to the nearest hundred (16 700)
- Answer corrected to the nearest ten (16 670)
- Answer = 16 000, or 16 600, or 16 660, or 17 666

(h)   **Scale 5B***   **(0, 3, 5)**

In a sale all items are reduced by 30%.
During the sale a pair of jeans sells for €17·50.
Find the cost of the pair of jeans before the sale.

€17·50 ÷70×100 = €25   or   €17·50 ÷7×10 = €25

** Accept correct answer with no work.

* Failure to round or incorrect rounding.

Partial Credit

- Calculates 30% of €17·50 (5·25).
- Misplaced decimal
- Answer = 17·50 + 5·25 = €22·75
- Inverts 70% (17·50 ÷ 100 × 70 = €12·25)
- Answer = €17·50 ± 30 = €47·50 or €12·50
- Answer = 17·50 ÷ 70 (0·25)
- Answer = 17·50 ÷ 30 × 100 = €58·33

(i)   **Scale 5B***   **(0, 3, 5)**

The heights of five students are 165 cm, 142 cm, 158 cm, 157 cm, and 169 cm.
Find the average (mean) height of the five students.

$$\text{Average height} = \frac{165 + 142 + 158 + 157 + 169}{5} = \frac{791}{5} = 158 \cdot 2 \text{ cm.}$$

** Accept correct answer with no work.

* Incorrect or omitted units.
* Truncates answer to 158 cm even with no work.

Partial Credit
- Multiplies total by 5 (3955)
- Omission of division (791)
- Misplaced decimal
- Any indication of addition
- Multiplies one of the heights by 5
- List evident but height omitted
- Mishandles total on calculator (655·80)

No Credit
- Answer = 5
- Multiplies heights only
- Answer = any of the listed numbers with no work (except 158)

(j)   **Scale 5B**   **(0, 3, 5)**

Find $3\dfrac{2}{3} \times 2\dfrac{1}{6}$

$$\frac{11}{3} \times \frac{13}{6} = \frac{143}{18} = 7\frac{17}{18} \quad \text{or} \quad 3 \cdot 6666666666 \times 2 \cdot 1666666666 = 7 \cdot 9444444$$

** Accept correct answer with no work.
** Accept answer written as 143/18 or decimal form (7·94444444).
** Accept equivalent of 143/18.

Partial Credit
- Misplaced decimal
- Incorrect denominator or numerator
- Divides fractions
- Adds or subtracts the fractions
- Answer = 6 and any fraction other than 2/3
- Mishandles fraction button on calculator (Answer = 2/3)

QUESTION 2

(a)   **Scale 10C, 5B**   **(0, 3, 7, 10); (0, 3, 5)**

Tax Credit Certificate	
FOR THE YEAR 1 JANUARY 2013 TO 31 DECEMBER 2013 AND FOLLOWING YEARS	
Tax Credits	**€**
Personal Tax Credit	1650
PAYE Tax Credit	1650
Rent Relief	300
Gross Tax Credits	
Net Tax Credits	
Tax Rate Bands	**€**
Rate Band 1	32 800
The amount of your income taxable at **20%**	32 800
All income over **€32 800** is taxable at **41%**	

> Fill in the missing details in the Tax Credit Certificate above.

(a)   **Gross Tax Credits**   **Scale 10C**   **(0, 3, 7, 10)**

> Gross Tax Credits = 1650 + 1650 + 300 = €3600

** Accept correct answers with no work.

High Partial Credit
- List evident but omits one value (1650 + 1650 = 3300; or 1650 + 300 = 1950)
- Misplaced decimal
- Subtracts instead of adds (1650 + 1650 – 300 = 3000; or 1650 – 300 = 1350)

Low Partial Credit
- Answer = 1650 only or 300 only

(a)   **Net Tax Credits**   **Scale 5B**   **(0, 3, 5)**

> €3600

** Accept correct answer without work.
** Accept answer from **(a) Gross Tax Credits** above.

Partial Credit
- Omits one value when calculating
- Answer = 1650 or 300
- Answer = 3600 × 2 = 7200
- Answer = 32 800 – 3600 = 29 200
- Answer = 32 800

(b)   **Scale 5B, 5B, 5B** $(0, 3, 5) \times 3$

Standard rate cut-off point (€)		
Yearly	*Monthly*	*Weekly*
32 800	2733·33	630·77

Tax Credits (€)		
Yearly	*Monthly*	*Weekly*

Using the information from the Tax Credit Certificate, fill in the missing details in the table.

(b)   **Yearly**   **Scale 5B**   **(0, 3, 5)**

    €3600

** Accept correct answer without work.
** Accept candidate's answer from part **(a)**.

Misreading (Full Credit –1)
- Enters *Monthly* or *Weekly* answer into *Yearly* (applied once only)

Partial Credit
- Any use of 32 800

No Credit
- Dropping down yearly or monthly or weekly values (32 800 or 2733·33 or 630·77) with no work

(b)   **Monthly**   **Scale 5B**   **(0, 3, 5)**

    €3600 ÷ 12 = €300

** Accept correct answer without work.

Partial Credit
- Answer = 2733·33 ÷ 12 = 227·7777
- Uses 32800 ÷ 12 = 2733·33; or 630·77 ÷ 12 = 56·730833
- Fails to divide by 12
- Answer = 12
- Any use of €2733·33

(b)   Weekly   **Scale 5B**   (0, 3, 5)

€3600÷52 = €69·23

** Accept correct answer without work.
** Accept candidate's answer from part **(a)**.

Partial Credit
- Answer = 630·77 ÷ 52 = 12·130192
- Uses 32800 ÷ 52 = 630·76923; or 2733·33 ÷ 52 = 52·5640
- Fails to divide by 52
- Any use of €630·77
- Answer = 52

(c)   **Scale 5B, 5B**   (0, 3, 5) × 2

This week Ian earned €610·00.
Find Ian's **gross tax** and Ian's **net tax** for this week.

(c)   Gross Tax   **Scale 5B**   (0, 3, 5)

€610 × 20% = €122

** Accept correct answer without work.

Partial Credit
- Uses 41% (250·10)
- Calculates 120% (732)
- Answer = €610 – €122 = €488
- Calculates 141% (€860·10)
- Inverts 20% (3050)
- Inverts €610
- Misplaced decimal
- Answer = 610 ± 20 = 630 or 590
- Finds 20% of a relevant number

(c)   Net Tax   **Scale 5B**   (0, 3, 5)

€122 – €69·23 = €52·77

** Accept correct answer with no work.
** Accept candidate's answer from part **(c) Gross Tax** and part **(a)**.

Partial Credit
- Adds rather that subtracts tax credit (191·23)
- Answer = €610 – €69·23 = €540·77
- Answer for **Gross Tax** given for **Net Tax**, and *vice versa*
- Uses monthly or yearly tax credit
- Truncates answer
- Misplaced decimal
- Calculates net pay (€610 – €52·77 = €557·23)
- Calculates 20% of **Gross Tax** (122 × 20 ÷ 100 = 24·40) and stops
- Answer = €69·23 (credits only)
- Answer = €122 (gross tax only)
- Any use of **Gross Tax**

(d)   **Scale 10C**   **(0, 3, 7, 10)**

Put a tick (✓) in the correct box on each line to show the effect of each event on **Ian's net pay for this week**.	Will **increase** pay	Will have **no effect** on pay	Will **decrease** pay
The **Standard rate of tax** is changed from 20% to 22%.			✓
The **PAYE Tax Credit** is changed from €1650 to €1700.	✓		
The **Standard rate cut-off point** is changed from €32 800 to €33 000.		✓	

Full Credit
- All three correct

High Partial Credit
- Two correct

Low Partial Credit
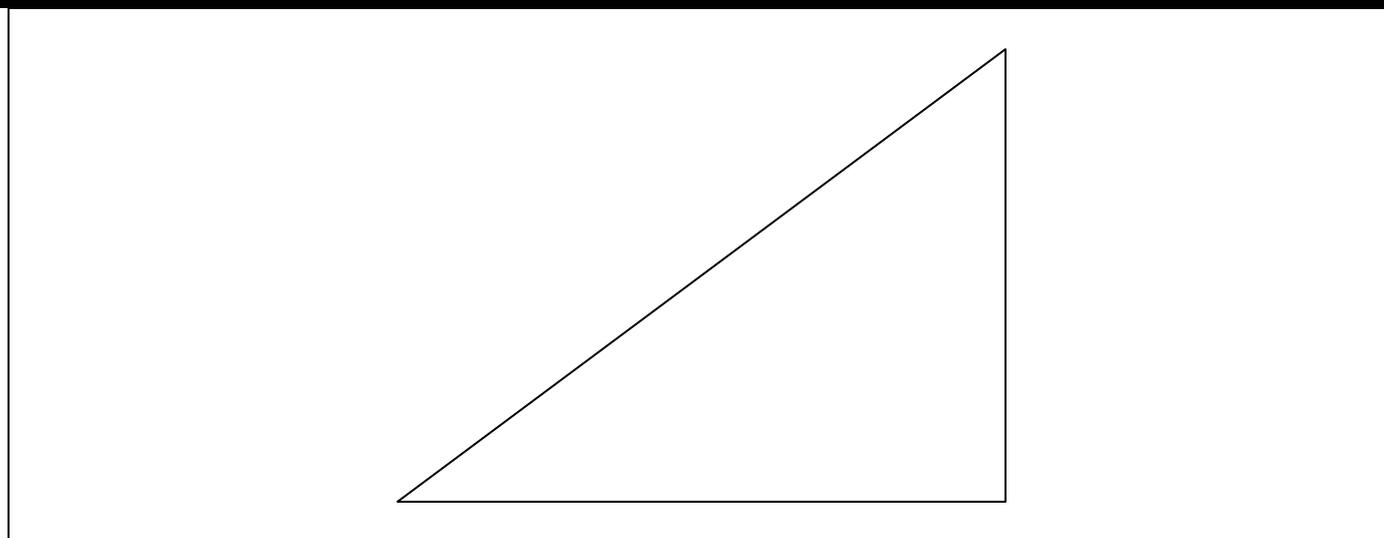- One correct

No Credit
- All answer/answers incorrect

QUESTION 3

Construct a triangle in which one side is 8 cm, another side is 6 cm, and the angle between these two sides is 90°.

** Tolerance ±0·1 cm or ±5°.

Full Credit
- All 4 measurements correct

High Partial Credit
- 3 measurements correct

Middle Partial Credit
- 2 measurements correct

Low Partial Credit
- 1 measurement correct
- Triangle not drawn with straight edge.

(b)   **Scale 10B***   **(0, 5, 10)**

Measure the length of the third side.

10 cm

Note: If no correct side or angle is drawn in part **(a)**, for part **(b)** candidate must measure longest side.
** Accept hypotenuse in candidate's diagram.
** Tolerance ±0·1 cm.
** Accept correct answer with no diagram.

* Incorrect or omitted units.

Partial Credit
- Side measured between tolerance 0·1 cm and 0·5 cm

No Credit
- Incorrect answer with no diagram
- Answer = 6 or 8, but not relevant to candidate's diagram

(c)   **Scale 5C**   **(0, 2, 3, 5)**

> Use the lengths of the sides of your triangle to check the Theorem of Pythagoras.
> *Theorem of Pythagoras*: "*In a right-angled triangle the square of the hypotenuse is the sum of the squares of the other two sides.*"

$6^2 + 8^2 = 10^2$
$36 + 64 = 100$
$100 \quad\ = 100$

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

High Partial Credit
- Error in the application of Pythagoras (e.g. $8^2 + 10^2 = 6^2$)
- Correct substitution and stops
- Misplaced decimal
- $6^2 = 2(6)$ and continues
- No hypotenuse ($6^2 + 8^2$)
- Incorrect conclusion (e.g. $100 = 89$)

Low Partial credit
- Constructs a square on all sides of the triangle and stops
- States that the triangle is the same as 3, 4, 5 and Pythagoras works
- States it is true as triangle has a right angle
- Correct conclusion no work

(d)(i)   **Scale 10B***   **(0, 5, 10)**

> A bathroom floor measures 3·75 m by 2·1 m.
> Calculate the area of the floor.

Area = $3{\cdot}75 \times 2{\cdot}1 = 7{\cdot}875$ m^2

** Accept correct answer with no work.

* Incorrect or omitted units.

Partial Credit
- Divides instead of multiplying ($3{\cdot}75 \div 2{\cdot}1 = 1{\cdot}7857142$)
- Misplaced decimal
- Calculates perimeter ($3{\cdot}75 \times 2 = 7{\cdot}5$; $2{\cdot}1 \times 2 = 4{\cdot}2$; $7{\cdot}5 + 4{\cdot}2 = 11{\cdot}7$)
- $3{\cdot}5 + 2{\cdot}1 = 5{\cdot}85$

(d)(ii)   **Scale 5C**   **(0, 2, 3, 5)**

> Square tiles of side 0·15 m are used to cover the floor.
> How many tiles are needed to cover the floor completely?

> Area of tile = 0·15 × 0·15 = 0·0225 m^2
> Number of tiles = 7·875 m^2 ÷ 0·0225 m^2 = 350 tiles
>
> Or: 3.75÷0.15 = 25
>   2.1÷ 0.15= 14
>   25×14= 350 tiles

** Accept correct with no work.
** Accept candidate's answer from part **(d)(i)**.

High Partial Credit
- Misplaced decimal
- Fails to divide floor area by the tile area having calculated both
- Truncates answer
- Answer = 25
- Answer = 14
- Answer = 7·875 ÷ 0·15 = 52·5

Low partial Credit
- Answer = Area of tile only (0·0225)
- Answer = Area of floor only (7·875)
- Some attempt to draw or count tiles or the floor
- Answer = 7·875 × 0·15 = 1·18125

(d)(iii)   **Scale 5C**   **(0, 2, 3, 5)**

> The tiles are sold in boxes.
> Each box contains 40 tiles, and costs €32.
> Only full boxes may be bought – it is not possible to buy part of a box of tiles.
> Find the total cost of the tiles.

> 350 ÷40 = 8·75 ⟹ 9 full boxes
> Cost of tiles = €32 ×9 = €288

** Accept correct with no work.
** Accept candidate's answer from part **(d)(ii)**.

High Partial Credit
- Fails to round to full box
- Mishandles 40
- Mishandles €32
- Misplaced decimal
- Calculates correct amount of boxes only

Low Partial Credit
- Answer = 40 × €32 and stops (1280)
- Answer = 40 ÷ €32 and stops (1·25)
- Answer = €32 ÷ 40 and stops (0·8)

QUESTION 4

(a)   **Scale 5B**   **(0, 3, 5)**

What is this type of graph called?

War (12)

Comedy (66)

Romance (51)

Horror (21)
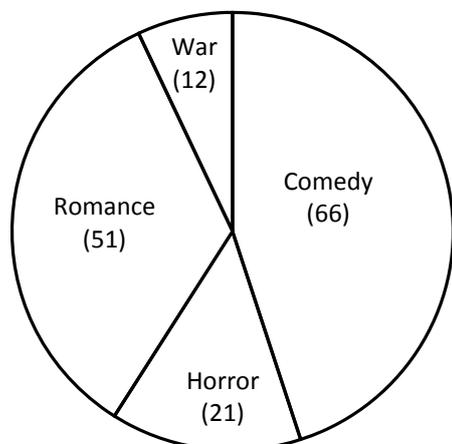
Pie Chart

Partial Credit
- Names another type of chart type (e.g. Trend /Bar/Histogram)

(b)   **Scale 5C**   **(0, 2, 3, 5)**

The number of students who picked each kind of film is shown in brackets on the graph.
How many students were surveyed, in total?

12 + 51 + 66 + 21 = 150 students

** Accept correct answer with no work.

High Partial Credit
- List evident with one omission
- Subtracts instead of adds

Low Partial Credit
- Answer = one of the numbers from the pie chart

(c)   **Scale 5C**   **(0, 2, 3, 5)**

What percentage of students chose *Comedy* as their favourite type of film?

$$\frac{66}{150} \times \frac{100}{1} = 44\,\%$$

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

High Partial Credit
- Inverts 66 / 150 (227·2727) or 150 / 100 × 66 = 99%
- Misplaced decimal
- Uses other categories (e.g. 12/150) and continues

Low Partial Credit
- Answer = 66%
- One substitution correct
- Any use of 100

(d)(i)   **Scale 10C**   **(0, 3, 7, 10)**

Five candidates stood for election to Dáil Éireann in a constituency with 3 seats.
The election was conducted under the PR system.
The total electorate, as contained in the Register of Electors, was 16 950.
The total poll was 12 500.
The number of spoiled votes (votes which were invalid) was 240.

Calculate the valid poll.

Valid poll = 12 500 – 240 = 12 260

** Accept correct answer with no work.

High Partial Credit
- Adds instead of subtracts (12 740)
- Uses 16 950 and continues (16 710)
- Ignores 240 in calculation (12 500)

Low Partial Credit
- Answer = 12 500 × 240 (3 000 000)
- Answer = 240
- Answer = 12 500 ÷ 240 (52·0833333)
- Answer = 16 950 + 12 500 (29 450)
- Answer = 16 950 – 12500 (4450)

No Credit
- 16 950 ÷ 3 = 5650
- 16 950 ÷ 5 = 3390

(d)(ii)   **Scale 10C***   **(0, 3, 7, 10)**

Calculate the quota, using the formula in the box.

$$\text{Quota} = \frac{\text{valid poll}}{\text{number of seats} + 1} + 1$$

$$= \frac{12260}{3+1} + 1 = 3066$$

** Accept candidate's answer for part **(d)(i)**.
** Accept correct answer with no work.

* Incorrect rounding or failure to round.

High Partial Credit
- Mishandles or ignores the second "+1" in the formula (3065)
- Correct substitution for valid poll and number of seats and fails to calculate quota correctly
- Misplaced decimal
- Mishandles the order of operation
- Number of seats $\neq 3$

Low Partial Credit
- One substitution, correct or incorrect, into formula and stops

(e)   **Scale 10C**   **(0, 3, 7, 10)**

On the right is a menu for a restaurant.

Complete the table below to show all of the 8 different three-course meals that can be chosen.

Starter	Main Course	Dessert
Soup or **Melon**	**Chicken** or **Beef**	**Apple pie** or **Ice cream**

Soup, Beef, Ice cream	Melon, Beef, Ice cream
Soup, Beef, Apple pie	Melon, Beef, Apple pie
Soup, Chicken, Ice cream	Melon, Chicken, Ice cream
Soup, Chicken, Apple pie	Melon, Chicken, Apple pie

Note: Each answer must be a **three-course meal**.

Full Credit
- Eight selections correct

High Partial Credit
- Four/Five/Six/Seven selections correct

Low Partial Credit
- One /Two/Three selections correct

No credit
- No selection correct

(f)   **Scale 5C**   **(0, 2, 3, 5)**

A customer chooses a three-course meal at random.
What is the probability that she chooses **SOUP** as her starter?

(f) $\dfrac{4}{8}$ or $\dfrac{1}{2}$

** Accept answer written as 4:8, 1:2, 4 in 8, 1 in 2, 4 out of 8, 1 out of 2, 0·5, 50%, 50:50, even chances, or evens.

** Accept candidate's answer to part **(e)**.

High Partial Credit
- No fraction or ratio set up
- Answer = 4 or 8 or 1
- Answer = 8/4 or 2/1 or 1/8
- Answer = 4 to 8; or 1 to 2; or 4 is to 8; or 1 is to 2

Low Partial Credit
- Any proper fraction other than 4/8 or 1/2 or 1/8
- Answer = 4 – 8
- Answer = 1 – 2
- Answer = 50-50 or 50/50

No Credit
- Answer = 3 (3-course meal)

QUESTION 5

(a) Scale 10C*, 5C*, 5C* (0, 3, 7, 10); (0, 2, 3, 5) × 2

Fill in the missing details on the *Call Charges* page of the telephone bill, using the *Guide to call prices* shown below.

Guide to call prices			
	Daytime price per min	*Evening price per min*	*Weekend price per min*
Local calls	5·25c	1·34c	1·34c
National calls	8·71c	5·25c	1·34c
Mobile calls	21·33c	15·14c	10·19c

Call Charges				
Type of call	*rate*	*number of calls*	*duration hr:min:sec*	*Cost (€)*
Local	Daytime	15	00:28:50	1·51
	Evening calls	28	01:16:30	
National	Evening calls	8	00:44:40	2·35
Mobile	Daytime	6	00:30:00	
Total call charges				

(a) Local Evening Calls Scale 10C* (0, 3, 7, 10)

1·34 c ×76·5 mins = 102·51 c = €1·03

** Accept correct answer with no work.

* Incorrect or omitted rounding.

High partial credit
- Fails to convert 1:16:30 to 76·5 minutes
- Uses 1:16:30 in calculation
- Uses incorrect price from *Guide to call prices*
- Misplaced decimal
- Divides by 76·5 (0·0175163)
- Failure to convert cent to euro
- Uses 1·34 in calculation
- Multiplies by 28 (28 × 1·34 = 37·52)

Low Partial Credit
- Answer = 1·34 ± 76·5 correct or incorrect (77·84 or 75·16)
- Uses any number from the *Guide to call prices* table

(a) Mobile Daytime Calls　　　　　　**Scale 5C***　　　　　　　**(0, 2, 3, 5)**

21·33 × 30 mins = 639·9 c = €6·40

** Accept correct answer with no work.

* Incorrect or omitted rounding.

High Partial Credit
- 1 Hour ≠ 60 minutes (e.g. 21·33 × 0·5 = 10·665)
- Misplaced decimal
- Divides by 30 (71·10)
- Rounds cost per min before multiplying (21 × 30 = 630)
- Failure to convert cent to euro
- Uses incorrect Guide to call price
- Multiplies by 6 (6 × 21·33 = 127·98)
- Answer = 6 × 0·30 = 1·80

Low Partial Credit
- Answer = 21·33 ± 30 correct or incorrect (51·33 or 8·67)
- Uses any number from the *Guide to call price* table

(a) Total Call Charges　　　　　　**Scale 5C***　　　　　　　**(0, 2, 3, 5)**

1·51 + 1·03 + 2·35 + 6·40 = €11·29

** Accept correct answer in any order.
** Accept candidate's answers from part **(a) Local Evening Calls** and part **(a) Mobile Daytime Calls**.

* Incorrect or omitted rounding.

High Partial Credit
- Misplaced decimal
- Omits cost
- Subtracts instead of adds

Low Partial Credit
- Answer = total of rates

(b)   **Scale 5B*,5B*,5B*,10B***   **(0, 3, 5) × 3; (0, 5, 10)**

> Using your answers from **(a)**, fill in the missing details on the summary page of the telephone bill below.

Your two-monthly telephone bill		
Your charges for this period		
Your service charges		44·42
Your call charges ... *see (a) above*		
Total VAT on €	at 23·00%	
Total charges for this period		

(b)   **Your call charges**   **Scale 5B***   **(0, 3, 5)**

€11·29

** Accept candidate's answer from part **(a) Total Call Charges**.

* Incorrect or omitted rounding.

Partial Credit
- Adds excess cost
- Any relevant number not covered above

(b)   **Total VAT on €**   **Scale 5B***   **(0, 3, 5)**

€11·29 + €44·42 = €55·71

** Accept candidate's answer from part **(a) Total Call Charges**.

* Incorrect or omitted rounding.

Partial Credit
- Each excess cost
- Omits a cost
- Subtracts instead of adds

(b)   Total VAT   **Scale 5B***   **(0, 3, 5)**

€55·71×23% = €12·81

** Accept candidate's answer from part **(b) Total VAT on €**.

* Incorrect or omitted rounding.

Misreading (Full Credit –1)
- VAT + Total call charges put in box, ie evaluates 123% (68·52)

Partial Credit
- Inverts 55·71
- Inverts 23%
- Misplaced decimal
- Calculates 23% of a relevant number

(b)   Total charges for this period   **Scale 10B***   **(0, 5, 10)**

€11·29 + €44·42 + €12·81 = €68·52
Or: €55·71 + €12·81 = €68·52

** Accept candidate's answer from part **(b) Total VAT.**
** Accept correct answer without work.

* Incorrect or omitted rounding.

Partial Credit
- Each cost omitted
- Each excess cost
- Subtracts instead of adds
- Misplaced decimal

Note: 123% filled in for **Total VAT** is *Misreading (Full Credit –1)*, and **Total charges for this period** blank is 0 marks.

(c)   **Scale 5B**   **(0, 3, 5)**

A bag contains 28 discs. Each disc is coloured red, yellow, or green.
There are twice as many red discs as yellow discs, and half as many green discs as yellow discs.
How many yellow discs are there?

$(2 + 1 + 0\cdot5) \times$ Number of yellow discs $= 28$
$(3\cdot5) \times$ Number of yellow discs $= 28$
$\Rightarrow$ Number of yellow discs $= 28 \div 3\cdot5$ $= 8$

(Number of red discs $= 16$; number of green discs $= 4$.)

** Accept correct answer with no work.

Partial Credit
- Misplaced decimal
- Answer = 4 with work shown
- Answer = 16 with work shown
- Answer = 28 ÷ 3 (9·333333)
- Answer = 3·5
- 28 ÷ 2 = 14
- 28 ÷ 0·5 = 56
- Some attempt at grid, drawing, or counting discs

Bonus marks for answering through Irish

Bonus marks are applied as follows:

If the mark achieved is 150 or less, the bonus is 5% of the mark obtained, rounded **down**.
For instance, 138 marks $\times$ 5% $= 6 \cdot 9$ $\Rightarrow$ bonus $= 6$ marks.

If the mark achieved is above 150, the following table applies:

Bunmharc (Mark achieved)	Marc Bónais (Bonus mark)	Bunmharc (Mark achieved)	Marc Bónais (Bonus mark)
151 – 153	7	174 – 180	3
154 – 160	6	181 – 186	2
161 – 166	5	187 – 193	1
167 – 173	4	194 – 200	0

Credit mark ranges

Candidates are awarded a credit from 0 to 10, inclusive, depending on the mark they are awarded.
The mark ranges associated with each credit are shown below.

Mark Range	Credit
180 – 200	10
162 – 179	9
144 – 161	8
126 – 143	7
108 – 125	6
90 – 107	5
72 – 89	4
54 – 71	3
36 – 53	2
18 – 35	1
0 – 17	0