Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2007

Mathematical Applications
(200 marks)

Friday, 8th JUNE
Morning 9.30 – 11.30

General Directions

1. Write your EXAMINATION NUMBER in this space:

2. Write all answers in the boxes or spaces in this answerbook.

3. Show necessary work on the right-hand blank page opposite each question.

4. Calculators may be used.

5. Answers involving money should be given correct to the nearest cent, unless otherwise indicated.

ATTEMPT QUESTION ONE AND THREE OTHER QUESTIONS.
ALL QUESTIONS CARRY EQUAL MARKS.

For the Superintendent only	*For the Examiner only*		
Centre Stamp	1.	Cumulative end-of-page total.	
	2.	Aggregate total of all disallowed questions.	
	3.	Total mark awarded (1 minus 2).	
	4.	Bonus mark for answering through Irish (if applicable).	
	5.	Total mark awarded if Irish Bonus (3 + 4).	
	Note:	The mark in row 3 (or row 5 if an Irish bonus is awarded) must equal the mark in the *Grand Total* box on the inside flap.	

1. (a) Calculate $\sqrt{99}$, correct to two decimal places.

(b) A child is prescribed 2·5 ml of medicine three times a day for five days. Calculate the total amount of medicine needed.

(c) An airplane leaves Cork airport at 22:50. It arrives in Glasgow airport one hour and forty minutes later.
At what time does the airplane arrive in Glasgow?

(d) An athlete runs 100 metres in 10 seconds.
Calculate his average speed in kilometres per hour.

(e) The price of a jacket is €50.
During a sale the price is reduced by 15%.
Calculate the sale price of the jacket.

(f) Given an exchange rate of €1 = $1·13,
convert $350 to euro.

(g) Calculate A.
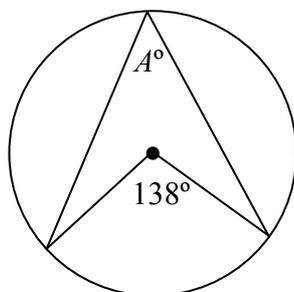
(h) The weights of five students are 45·6 kg, 47·1 kg, 43·7 kg, 44·6 kg and 50·6 kg.
Calculate the average weight of the five students.

(i) A box contains 50 raffle tickets, each having a different whole number from 1 to 50. If a ticket is drawn at random, what is the probability that the number chosen is less than 10?

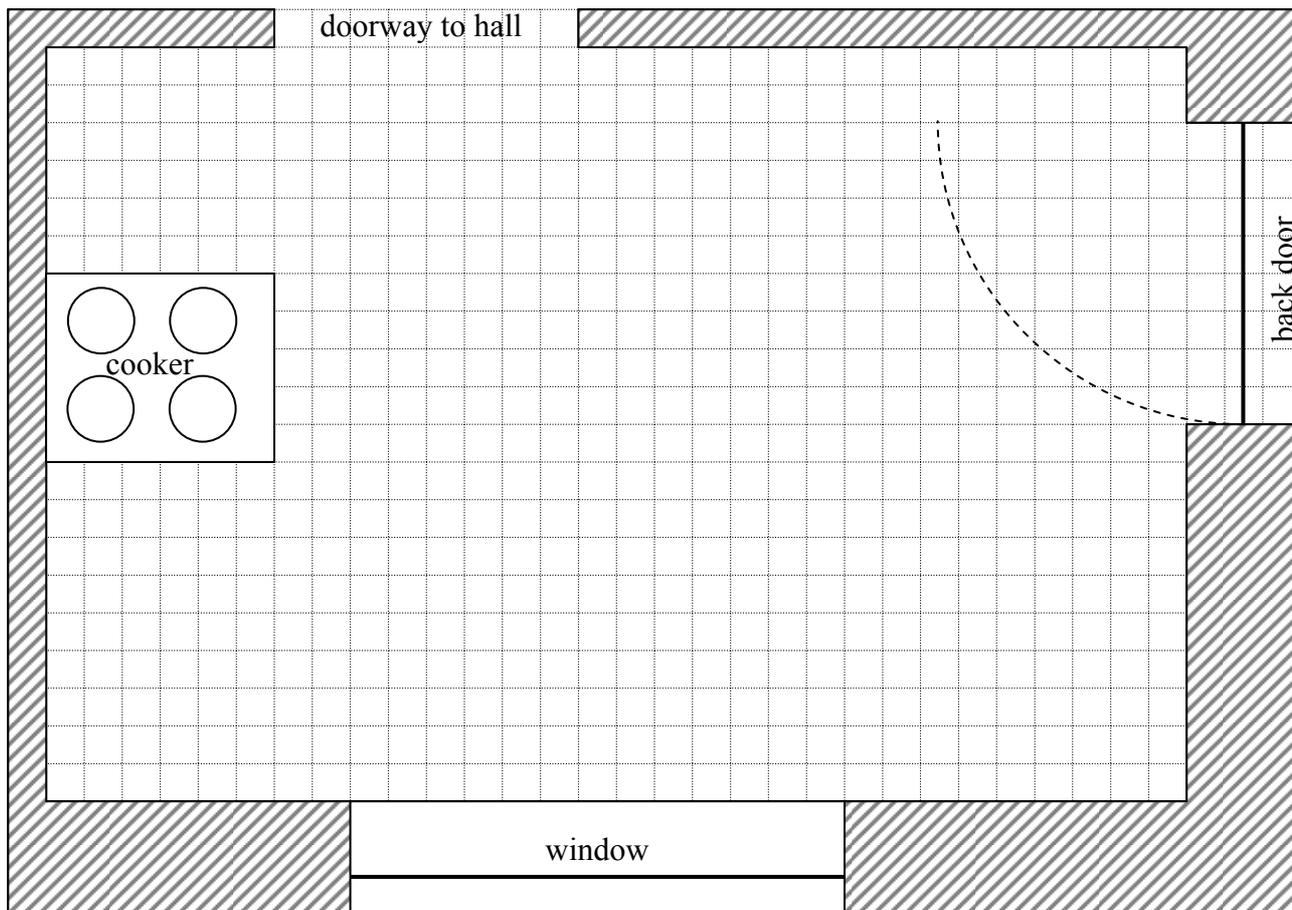**(j)** Convert 15° Celsius to degrees Fahrenheit using the formula:
$$F = C \times \frac{9}{5} + 32.$$

You may use this page to show any necessary work for Question 1.

2. **Research Element Question on *Scale*.**
   Below is a scaled drawing of a kitchen with the location of the cooker marked in.
   Scale 1:20

(a) Measure the internal length and width of the drawing of the kitchen, as it is shown in the diagram.

Length ……………………………………cm

Width ……………………………………cm

(b) Using the scale of 1 to 20, write down the actual measurements of the kitchen, in metres.

Length ………………………………m

Width………………………………m

(c) A fridge, a sink unit, and other kitchen units are to be fitted.
   The sink unit measures 100 cm by 60 cm.
   The fridge measures 60 cm by 60 cm.
   Draw the sink unit and the fridge in suitable locations on the above diagram, using the correct scale.
   Label them clearly.

(d) The remaining suitable spaces will contain kitchen units covered with countertop.
   The countertop is 60 cm deep. Complete your plan by drawing in the countertop.

You may use this page to show any necessary work for Question **2.**

3. A survey of fuels used in home heating is carried out.
The results are shown in the table below.

FUEL	OIL	GAS	COAL	OTHER
Percentage	40%	30%	25%	5%

(a) In the box below, draw a pie chart to illustrate this data.

(b) If 200 families used oil, calculate the total number of families that were surveyed.

(c) The average cost of a barrel of crude oil in 2000 was $26·58.
This cost increased to $56·17 in 2006.
Calculate the percentage increase.

(d) In an election the total poll was 49 230.
The number of spoiled votes was 630.
Calculate the valid poll.

(e) In this election four seats have to be filled.
Calculate the quota, using the given formula.

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

You may use this page to show any necessary work for Question 3.

4. (a) Fill in the missing details on this telephone bill:

Section A
Recurring Charges

type	*service*	*period*	*quantity@ price*	*cost*
Line Rental	Residence line	28 Aug 06 to 27 Oct 06	1 @ 39.96	39.96
Services Rental	mailbox	28 Aug 06 to 27 Oct 06	1 @ 2.30	2.30
			Total recurring charges	42.26

Section B
Call Charges

type of call	*rate per min*	*duration(hr:min:sec)*	*cost*
Local	4.83 cent	01:54:00	
National		02:30:00	11.10
To Mobiles	22.06 cent	00:38:03	8.39
		Total call charges	

Your bi-monthly telephone bill

Recurring charges *see section A*   42.26

Call charges *see section B*   [ ]

Charges for this period   [ ]

Vat on €[ ] **at 21%**   [ ]

Total bill   € [ ]

(b) A solid metal cylinder has diameter 1·5 cm and height 4 cm.

Calculate the volume of metal in the cylinder, taking $\pi = 3\cdot14$.

1·5 cm

4 cm

Volume of cylinder $= \pi r^2 h$
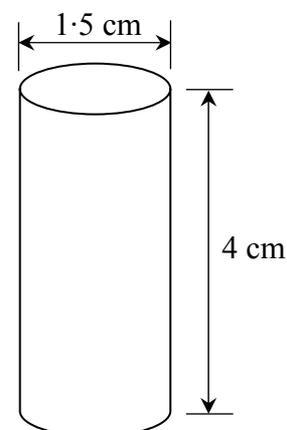
You may use this page to show any necessary work for Question 4.

5. Gemma's income for a basic 35 hour week is €532·60.

(a) Calculate Gemma's basic hourly rate.

(b) Gemma works $5\frac{1}{2}$ hours overtime.

The overtime rate is double the basic rate.

How much does she earn for the $5\frac{1}{2}$ hours overtime?

(c) Gemma gets a 4% pay rise.

Calculate her income for a $40\frac{1}{2}$ hour week,

after the pay rise.

(d) There are four teams in Pool A of a rugby championship.
Each team plays each of the other teams exactly twice.
How many matches are played in Pool A?

(e) There are SIX pools in this championship.

After the pool stage, EIGHT teams go forward to
a knock-out stage, consisting of quarter finals,
semi-finals, and a final.

How many matches are played in total during the
whole championship, assuming that there are no
replays?

You may use this page to show any necessary work for Question 5.

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