AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

Leaving Certificate Applied 2002

Mathematical Applications
(200 marks)

Thursday, 6th 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 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. Total of end of page totals.	
	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 Mór-Iomlán box on the script.	

1. **(a)** Find 34% of €76.94.

(b) How much in sterling pounds will you get for €300 when the exchange rate is €1=£0.62 sterling?

(c) The heights of six students are 153 cm, 162 cm, 161 cm, 155 cm, 161 cm and 159 cm. What is the average height of the six students?

(d) What is the volume of a cube of side 6 m?

(e) Convert 77° Fahrenheit to degrees Celsius, using the formula $C = \dfrac{5}{9}(F - 32°)$.

(f) What is the cost of six cans of minerals at €0.57 per can?

(g) A journey begins at 10:55 and ends at 16:35. How long does the journey take?

(h) Oil is mixed with petrol in the ratio 1:25. How many millilitres of oil are mixed with 1 litre of petrol?

(i) A person buys a car for €6240 and sells it at a profit of 15%. What is the selling price of the car?

(j) There are 6 red balls and 4 white balls in a bag. A ball is picked at random out of the bag. What is the probability that the ball is white?

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

2. **Research Element Question on Elections and Polls.**

Six candidates stood for election to Dáil Éireann in a 3 seat constituency.

This election was conducted under the PR system.

The total electorate as contained in the 'Register of Electors' was 31 500.

The total poll (turnout) was 20 790.

The number of spoiled votes (votes which were invalid) was 490.

(a) Calculate the percentage of the electorate who voted.

(b) Calculate the valid poll.

(c) Calculate the quota,
using the quota formula: {Valid Poll ÷ (number of seats + 1) + 1}.

(d) The results of the first count were declared as:

Candidate A	Candidate B	Candidate C	Candidate D	Candidate E	Candidate F
810	4360	5563	4965	2585	2017

Which candidate was elected on the first count?

(e) Which candidates received less than
15% of the valid poll?

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

3. *(a)* There are 5 teams in a league. Each team plays each of the other teams exactly four times. How many games are played in total?

(b) The numbers 1 to 50 are used in a lottery. What is the probability that the first number chosen contains the digit 5?

(c) Construct, in the box below, a rectangle in which the length is 4 cm and the width is 3 cm.
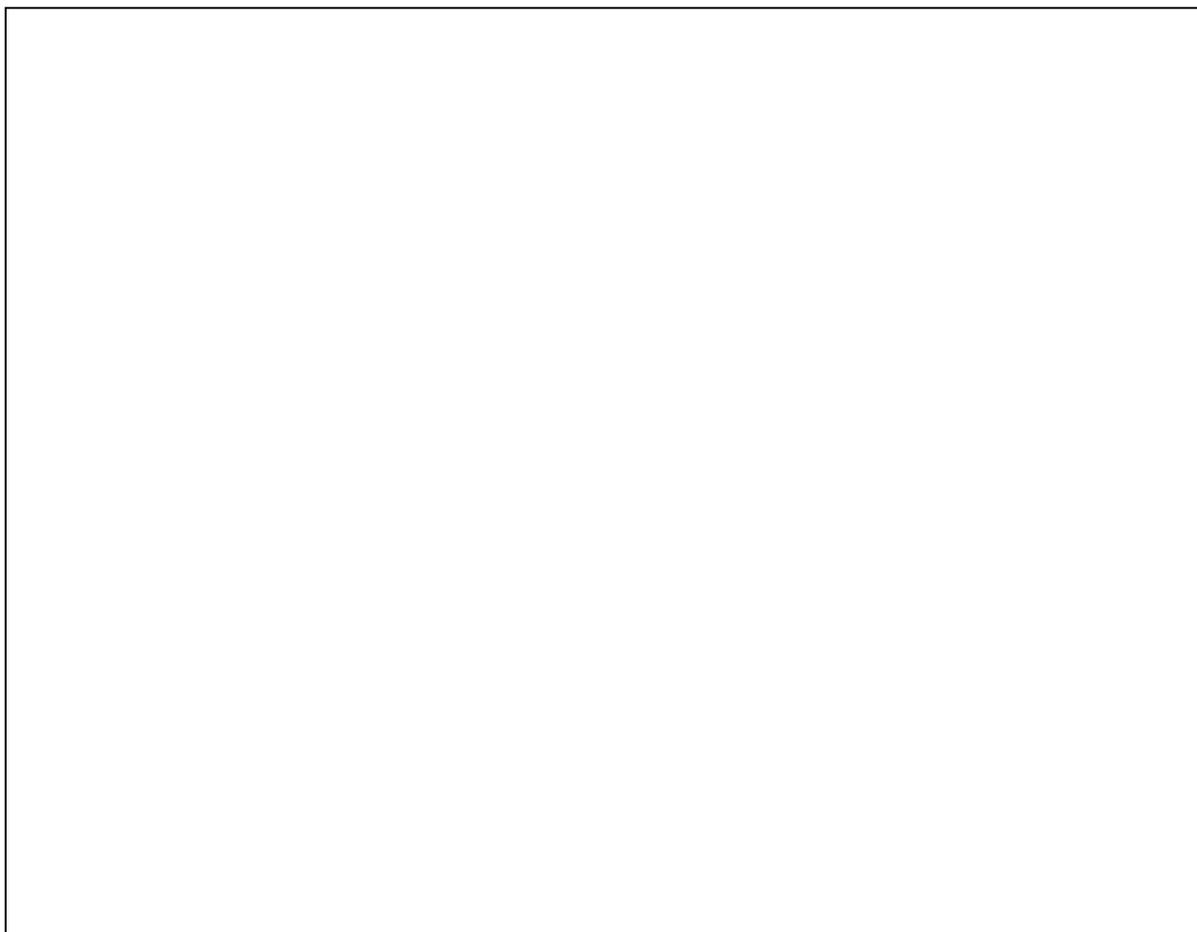
(d) Draw a diagonal in the rectangle you have constructed in part *(c)*

and write its length here.

(e) Construct, on your diagram, in part *(c)*, a circle, with the mid-point of the diagonal as centre and the diagonal as a diameter.

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

4. The following scale of charges, for a self-catering holiday in France, is advertised as follows:

Apartment type	Classic A Price per person for 4 sharing		Classic B Price per person for 5 sharing		Classic C Price per person for 6 sharing		Club A Price per person for 4 sharing		Club B Price per person for 5 sharing		Club C Price per person for 6 sharing	
No. of nights	7	14	7	14	7	14	7	14	7	14	7	14
Date of arrival												
1 June – 28 June	240	320	260	340	280	360	330	400	360	430	390	460
29 June – 12 July	260	330	280	350	300	370	350	430	375	455	400	480
13 July – 26 July	280	330	300	350	320	370	370	430	395	455	420	480
27 July – 16 Aug	310	360	330	380	350	400	390	470	415	495	440	520
17 Aug – 30 Aug	250	340	270	360	290	380	340	410	370	440	400	470

* All prices are in euro.
* Travel costs are not included.

(a) Four people arrive on 29 June for 14 nights.
What is the cost for the four people if they stay
in a Club A apartment?

(b) Five people arriving on 27 July stay for 14 nights
in a Club B apartment.
What would they have saved, per person, by arriving
on 20 July staying in a Club B apartment for 14 nights?

(c) Six people are given a 5% reduction in the cost of an apartment.
What will it cost, per person, for a 14 night stay in a Classic C
apartment arriving on 3 August?

(d) A holiday company has a special offer for people arriving on 1 June:
Return ferry from Ireland to France + Classic C apartment for four
persons for 7 nights for €199 per person.
Four people avail of this special offer.
Calculate the cost of their holiday.

(e) Four people stay in a Classic C apartment for 7 nights
arriving on 17 August. They have to pay the price for
six people.
What is the cost, per person, for the four people?

You may use this page to show any necessary work for Question 4.

5. Mary, a salesperson, is paid a basic hourly rate of €9.50 for a 38 hour week. Overtime is paid at time and a half.

(a) Last week Mary worked 47 hours. Fill in the table to calculate her gross earnings for last week.

Basic week	38 hours @ €9.50 = € _____
Overtime	_____ hours @ € _____ = € _____
	Gross earnings for 47 hour week = € _____

(b) Mary has a weekly sales target of €3000. She is paid a bonus of 5% of sales over €3000 in a week.
Calculate her bonus in the week her sales amounted to €4500.

A part of a gas bill is shown.

Meter Reading in units		Conversion	Gas used
Present	Previous	Units x Conversion factor =	kWh
2194	2108	?? x 32.3430 =	??

(c) How many units of gas were used?

(d) How many kWh were used, to the nearest kWh?

(e) Calculate the cost of the gas used at 1.97612 cent per kWh.

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