AN ROINN OIDEACHAIS

JUNIOR CERTIFICATE EXAMINATION, 1996

MATHEMATICS - ORDINARY LEVEL - PAPER 1 (300 marks)

THURSDAY 6 JUNE - MORNING 9.30 a.m. to 12 noon.

Attempt **QUESTION 1** (100 marks) and **FOUR** other questions (50 marks each).

Marks may be lost if all necessary work is not clearly shown.
Mathematics Tables may be obtained from the Superintendent.

1.

(i) VAT at 12.5% is added to an electricity bill of IR£80. Calculate the total bill.

(ii) Find the total cost of :
  5 litres of milk @ 62p per litre
  6 apples @ 12p per apple
  3 chickens @ IR£1.99 per chicken.

(iii) Use the Tables p20 - 27, or otherwise, to find the value of

$$\left(\frac{3}{4}\right)^2 + \sqrt{1.96}.$$

(iv) A sum of money was divided in the ratio 5 : 2. If the larger share was IR£39 more than the smaller share, calculate the sum.

(v) Express p in terms of q and r when

$$3p + 2q = 5r.$$

(vi) Solve for x :
$$4(x + 3) = 18.$$

(vii) A function f is $x \rightarrow 2x - 7$.
Find the value of $f(2)$.

(viii) Find the values of x for which
$$5 - 2x \geq 1, \quad x \in \mathbf{N}.$$

(ix) The mean of the numbers 3, 4, 5, 8 is the same as the mean of the numbers 2, 4, x. Calculate x.

(x) Multiply 480 by 0.3 and express your answer in the form $a \times 10^n$, where $1 \leq a < 10$ and $n \in \mathbf{Z}$.

2. Write down the formula for the volume of a cylinder with radius length r and height h. See Tables, page 7, if you wish.

Find the volume, in cm³, of a cylindrical carton with radius length 5 cm and height 7 cm, taking $\pi = \dfrac{22}{7}$.

Cartons of this type are filled with yogurt. How many cartons must be filled so that the total amount of yogurt contained in them is 22 litres?
[1 litre = 1000 cm³].

Larger cylindrical cartons are filled with ice-cream. Each larger cylindrical carton has height 14 cm and a volume of 4.4 litres.

Calculate the radius length of these larger cartons, taking $\pi = \dfrac{22}{7}$.

3. (a) Factorise $x^2 + 5x + 6$.

(b) (i) Factorise $x^2 - xy + xz - yz$.

(ii) Multiply $x^2 - 5x + 4$ by $x - 4$.

(c) Five televisions and six radios cost IR£1555.
A television costs IR£245 more than a radio.
Let IR£x be the cost of a television and let IR£y be the cost of a radio.

Write down two equations, each in x and y, to represent all the above information.

Solve the equations to find the cost of a radio.

4. The table shows the number of hours of sunshine recorded each day for one week in May.

Day	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Number of hours of sunshine	8	7	9	6	6	7	5

(i) Draw a trend graph of the data, putting days (Mon., Tues. etc.) on the horizontal axis.
[Graph paper is available from the Superintendent.]

(ii) How many hours of sunshine were recorded for the week?

(iii) The number of hours of sunshine recorded for the week represents 30% of the total number of hours of sunshine recorded for the month of May.

Calculate the number of hours of sunshine recorded for the month of May.

(iv) Calculate the mean number of hours of sunshine recorded per day for the month of May, correct to one place of decimals.
[There are 31 days in May.]

5. Draw the graph of the function f :
$$x \rightarrow x^2 - 3x + 2$$
in the domain $-1 \leq x \leq 4$.

Use your graph to estimate, or otherwise find,

(i) the value of $f(1.5)$

(ii) the values of x for which $f(x) = 5$

(iii) the values of x for which $f(x) - f(3) = f(0) - f(1)$.

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6.　　(a)　A train departed Limerick at 0935 hours and arrived in Dublin at 1210 hours. How many hours and minutes did the journey take?

(b)　In a survey of 100 teenagers,

　　　 80 like 'rock' music,
　　　 12 like both 'rock' and classical music,
　　　 7 like neither type of music.

(i)　Draw a Venn diagram to represent this information.

(ii)　How many teenagers like classical music only?

(c)　A person invests IR£12 400 at the rate of 6.5% per annum compound interest. What does the investment amount to at the end of 2 years?