AN ROINN OIDEACHAIS M.46(a)

INTERMEDIATE CERTIFICATE EXAMINATION, 1980

MATHEMATICS - LOWER COURSE - PAPER II (150 marks)

MONDAY, 16 JUNE - MORNING 9.30 to 12

Examination Number

SECTION A (45 marks)

Attempt all questions. You should not spend more than 45 minutes on this section.
Answer each question by writing one of (a), (b), (c), (d) in the box under each question number.
If you wish to change an answer, cross out your first choice and write your new answer near the box.
Mathematical tables may be obtained from the Superintendent.

THIS PAPER MUST BE ENCLOSED IN YOUR ANSWER BOOK.

1. Each one of the numbers 6, 10, 12, 14 is a multiple of

(a) 3 (b) 6 (c) 2 (d) 5

2. $(0{\cdot}12)^2$ =

(a) 1·44 (b) 0·0144 (c) 0·144 (d) 0·00144

3. $(0{\cdot}8029) \times 10^{-1}$ =

(a) 0·8029 (b) −80·29 (c) 80·29 (d) 0·08029

4. 5% of £x is £15. Then 8% of £x is

(a) £24 (b) £10 (c) £40 (d) £80

5. An article bought for £48 is sold at a profit of $12\frac{1}{2}\%$. The selling price is

(a) £60·50 (b) £56 (c) £42 (d) £54

6. In the base 2, the next natural number greater than 1011_2 is

(a) 1010_2 (b) 1100_2 (c) 1111_2 (d) 11011_2

7. The n th term of a sequence is $2n^2-1$. The 3rd term is

(a) 17 (b) 18 (c) 35 (d) 11

OVER →

8. Which one of the following is equal to -6 ?

(a) $-14 + 8 - 3$ (b) $-2(3 - 1) + 2$

(c) $-4(3 - 5) - 14$ (d) $4(3 - 5) - 14$

9. $H = \{1, 2, k\}$ and $K = \{2, t\}$. Then $H \cap K$ is

(a) $\{1, 2, k, t\}$ (b) $\{1\}$ (c) $\{1, k, t\}$ (d) $\{2\}$.

10. There are 36 candidates in an examination hall. The number that are left handed is represented on a pie-chart by an angle of 30°. This number is

(a) 3 (b) 5 (c) 10 (d) 12

11. $\dfrac{x^2 - 25}{x - 5} =$

(a) $x^2 - 5$ (b) $x - 5$ (c) $x + 5$ (d) $x - 20$

12. $\dfrac{3x}{4} = \dfrac{1}{2}$ implies x is equal to

(a) 2 (b) $\frac{1}{2}$ (c) $\frac{3}{8}$ (d) $\frac{2}{3}$

13. Which one of the following couples (x, y) satisfies both $3x + y = 5$ and $7x - 4y = 18$

(a) (1, 2) (b) (2,−1) (c) (3,−4) (d) (5,−10)

14. If $f(x) = \dfrac{1}{x + 1}$, then $f(x + 1)$ is

(a) $\dfrac{1}{(x + 1)^2}$ (b) $\dfrac{1}{x + 2}$ (c) $\dfrac{1}{2x + 1}$ (d) 1

15. $3x - 2 < 2 - x$ implies

(a) $x > 2$ (b) $-x < -4$ (c) $x < 1$ (d) $x < 0$

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SECTION B (105 marks)

Attempt **QUESTION 1** and **THREE** other questions

1. (a) Furniture was bought and paid for in 3 stages:
   (i) a downpayment of £225
   (ii) some months later, £400 together with a 5% charge on the £400
   (iii) lastly, £275 together with a $12\frac{1}{2}\%$ charge on the £275.
   Calculate, correct to the nearest penny, the total price paid.

   (b) Calculate the compound interest on £2000 for 2 years at 21% per annum.

(25 marks)

2. (a) Simplify $y - 4(3y - 7) - (26 - 11y) + y$.

   (b) Multiply $2x^2 - 3x + 4$ by $x - 7$.

   (c) Solve $11x - 5(2x - 1) = 3(6 - x) + 1$.

(20 marks)

3. (a) Factorise $x^2 + 7x - 18$
   and hence solve
   $$x^2 + 7x = 18.$$

   (b) Graph on the number line
   (i) $3 \leqslant x < 7$ for $x \in \mathbf{N}$
   (ii) $2x + 5 > -x - 4$ for $x \in \mathbf{R}$

(20 marks)

4. The frequency table below shows the number of goals scored by 34 teams in 17 matches, each team playing once only.

Number of goals	0	1	2	3	4	5
Number of teams	8	7	6	6	4	3

   (i) How many teams scored (a) 3 goals or less ?
   (b) 3 goals or more ?

   (ii) What is the mode of the frequency distribution ?

   (iii) What is the mean number of goals scored
   (a) per team ?
   (b) per match ?

   (iv) What is the maximum number of "draws" possible from the data in the table ?

(25 marks)

OVER →

5. Graph the function $x \to x^2 - 3x - 4$ in the domain $-1 \leqslant x \leqslant 4$.

(i) On your graph sketch in the line parallel to the x-axis which cuts the graph at one point only.

(ii) From your graph, or otherwise, find the value of

$x^2 - 3x - 4$ when $x = \frac{3}{2}$.

(iii) Calculate the area of the smallest rectangle which encloses the graph.

(25 marks)

6. (a) Solve the simultaneous equations

$x = 3y + 5$

$y = 3x - 3.$

(b) Forty athletes took part in a sports meeting. Eleven entered for the high jump. Some entered for the long jump. Twenty one did not enter for either jump.

(i) Set out the data in a Venn diagram.

(ii) How many athletes entered for the long jump only ?

(iii) What is the maximum number of athletes who could have taken part in the long jump ?

(25 marks)

7.

	September	June	January
Price per bag in the month of		x p	
Total cost of potatoes in			

Copy this table into your answer book. Use the information below to fill in the blanks and then complete the question.

A bag of potatoes in September is 75 p less than the price in June.

A bag of potatoes in January is 150 p more than the price in June.

The same amount of money bought 20 bags in September and 11 bags in January.

Find the cost per bag in June.

(30 marks)