AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 2002

MATHEMATICS - FOUNDATION LEVEL

PAPER 1 (300 marks)

THURSDAY, 6th JUNE - MORNING, 9.30 - 12.00

FORMULAE FOR PAPER 1

Compound Interest and Depreciation :

$$\mathrm{A} = \mathrm{P}\left(1 \pm \frac{r}{100}\right)^n; \qquad \mathrm{P} = \frac{\mathrm{A}}{\left(1 \pm \frac{r}{100}\right)^n}.$$

The solutions to the quadratic equation $ax^2 + bx + c = 0$ are

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

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

Marks may be lost if necessary work is not clearly shown.

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1. **(i)** Find $\sqrt{125}$, correct to one decimal place.

(ii) Find $(2.7)^3$, correct to two decimal places.

(iii) Find $\sqrt{40.5} + \sqrt{86.49}$, correct to the nearest whole number.

(iv) Find the value of $\dfrac{1}{0.025} - \dfrac{2^4}{0.625}$.

(v) Find 28% of €35.52, correct to the nearest cent.

(vi) €1 is worth 120 Japanese yen.
Find, to the nearest euro, the value of 6250 Japanese yen.

(vii) In a game, a person scored 183 points out of a possible maximum of 270.
Express this score as a percentage, correct to two significant figures.

(viii) Find $\dfrac{2}{5} + \dfrac{3}{17}$, correct to two decimal places.

(ix) Find, to the nearest hundred, the value of

$$\left(3.8 \times 10^6 + 9.5 \times 10^5\right) \div 7.7 \times 10^2 .$$

(x) Find the value of

$$\frac{(25.3 + 4.7) \times 6.04}{22.8 - 11.7},$$

correct to three decimal places.

2. **(a)** A bag contains two books. One has a mass of 1.3 kg and the other a mass of 750 g. Find their total mass.

(b) A person worked a 43-hour week. The basic rate of pay for the first 35 hours was €7.20 per hour. Extra hours were paid at the overtime rate of 1.5 times the basic rate.

Find

(i) the total income for the first 35 hours
(ii) the overtime rate per hour
(iii) the total income for the 43 hours worked.

(c) **(i)** A car travels a distance of 220 km in 2 hours 45 minutes. Find its average speed for the journey.

(ii) The next day, the car travels the same distance, with the speed reduced by 10%. Find, to the nearest minute, how much longer this journey takes.

3. **(a)** An estimate for repairing a CD player was €30. The actual cost of the repair was €31.57.

Find

(i) the error in the estimate
(ii) the percentage error, correct to one decimal place.

(b) €1250 is invested at 3.5% per annum compound interest.

Find, to the nearest euro, its value at the end of three years.

(c) A one-year-old car is valued at €12 000. It has depreciated in value by 20% during the first year. What was its value when new?

If depreciation continues at 20% per annum, what will be its value when it is three years old?

4. **(a)** Solve $9x - 3 = 3x + 18$.

(b) Solve the simultaneous equations

$$\begin{aligned} 3x - 5y &= 16 \\ 2x + y &= 2. \end{aligned}$$

(c) **(i)** Solve $5x - 1 \leq 14$.

(ii) Solve $4 - 3x \leq 7$.

(iii) Write down all the whole numbers, positive and negative, which satisfy both $5x - 1 \leq 14$ and $4 - 3x \leq 7$.

5. **(a)** **(i)** Write down all of the whole number factors of 28.

(ii) Find the sum of these factors.

(b) Solve the quadratic equation $2x^2 + 7x - 2 = 0$.

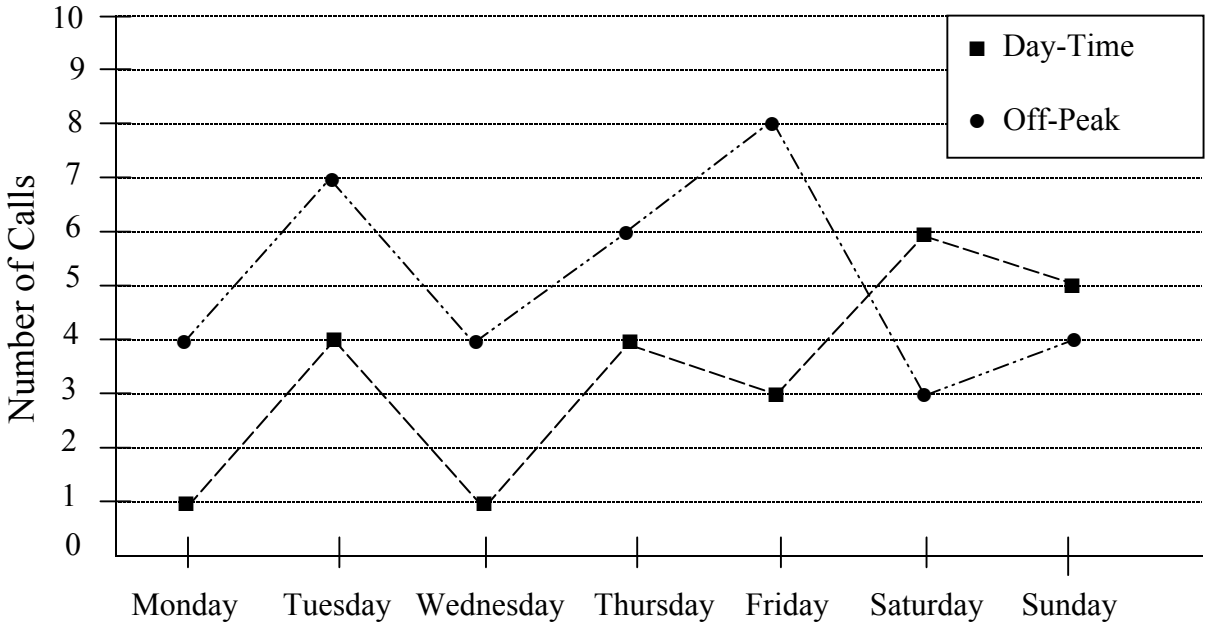
Give your answers correct to two decimal places.

(c) When 3 is subtracted from four times a certain number the result is the same as twice that number added to 10.

Let x represent this certain number and write this information as an equation in x.

Hence, solve the equation for x.

6. The graph below shows the number of calls made on a mobile phone during a seven-day period. Calls have been separated into two types: Day-Time and Off-Peak. For example, on Monday, one Day-Time call and four Off-Peak calls were made.



(i) How many Day-Time calls were made on Tuesday?

(ii) What is the total number of calls made over the seven days?

(iii) Over the seven days, what percentage of calls were Day-Time calls?

(iv) On which days of the week were more than 10 calls made?

(v) Find the average number of calls made per day.

7. Draw the graph of the function

$$f : x \to 2x^2 - 5x + 2 \quad \text{for} \quad -1 \le x \le 3, \quad x \in \mathbf{R}.$$

Use your graph to find as accurately as possible

(i) $f(0.5)$

(ii) the values of x for which $f(x) = 3$

(iii) the minimum (least) value of $f(x)$

(iv) the range of values of x for which $f(x)$ is decreasing.