AN ROINN OIDEACHAIS.

AN BRAINSE GAIRM-OIDEACHAIS.

CERTIFICATE EXAMINATIONS
for
DAY VOCATIONAL COURSES, 1953.

MATHEMATICS.

Monday, June 22nd.—10 *to* 1 *p.m.*

INSTRUCTIONS.

(*a*) Not more than *eight* questions to be attempted.

(*b*) The marks allotted to each question are shown in brackets under.

(*c*) Mathematical Tables are supplied.

(*d*) Special credit will be given to candidates who display neatness and order in answering.

(*e*) All the work must be shown in the answer book.

1. (*a*) Simplify :

$$\frac{\frac{1}{2}-\frac{1}{3}+\frac{1}{4}}{1-\frac{7}{12}} \div \frac{3}{4}$$

(*b*) With as little working as possible, find an *approximate* value of

$$\frac{265\times 0{\cdot}17\times 8}{1{\cdot}69\times 525}$$

[10 marks.]

2. In the Monte Carlo Rally, a driver covered 3,200 kilometres in 65 hours 40 minutes. Find his average speed in miles per hour.

[1 metre=39·37 inches.]

[10 marks.]

[P.T.O.

3. Taking the production for 1938 at 100, the following figures represent the production of electrical energy by the Electricity Supply Board :—

Year ..	1946	1947	1948	1949	1950
Production	155	165	190	210	255

Find (*a*) the average annual figure for production over the period 1946 to 1950 (both dates inclusive) ; (*b*) the percentage increase in 1950 over the 1946 figure.

[10 marks.]

4. Find the cost of 5 tons 6 cwt. 3 qrs. turf at £2 13s. 8d. per ton.

Answer to the nearest penny.

[10 marks.]

5. From the formula

$$E=\frac{0{\cdot}007lv^2}{d}$$

express d in terms of the other quantities ; hence find d when $E=350$, $l=3{,}000$, and $v=5$.

[10 marks.]

6. Factorize the following :—

(*a*) $ax-ay+bx-by$,

(*b*) $2x^2-9x-5$,

(*c*) $9a^2-49$,

(*d*) $3x^3-24$.

[10 marks.]

7. Solve the following equations :—

(*a*) $30p-10q=4p+3q=10$.

(*b*) $x^2-10=3x$.

[12 marks.]

8. Find, by logarithms, the value of the following :—

(*a*) $\sqrt[3]{54{\cdot}6}$.

(*b*) $(\cdot1583)^2\times3{\cdot}142$.

(*c*) $\dfrac{8{\cdot}752\times\cdot0351}{18{\cdot}72}$

[12 marks.]

9. A certain petrol tank measures $19'' \times 8\frac{1}{2}'' \times 14''$.

Find (*a*) its capacity to the nearest pint, and (*b*) the weight of the petrol to the nearest lb. if its Specific Gravity is 0·70 ?

1 cubic foot $= 6\frac{1}{4}$ gallons. 1 gallon water weighs 10 lb.

[14 marks.]

10. Define a *Radian*.

Calculate what length of arc subtends 23° at the centre of a circle of 5″ radius.

[14 marks.]

11. Prove that the angle in a semi-circle is a right angle.

Construct a triangle ABC, given BC = 1·8″, AB = 3″, and the angle ACB = 90°. Measure the length of AC.

[14 marks.]

12. The following table shows the weight of a wagon when loaded with boxes, each of which has the same weight :

Gross weight (in tons)	4·8	5·8	7·3	8·3	9·8
Number of boxes ..	12	20	32	40	52

Draw a graph of these figures, and find, from the graph :

(*a*) the weight of the empty wagon,

(*b*) the weight of a box.

[14 marks.]