AN ROINN OIDEACHAIS

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1943.

MATHEMATICS—Arithmetic.

TUESDAY, 15th JUNE.—MORNING, 10 TO 12 NOON.

Six questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

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1. A person buys a commodity at £3 13s. 9d. per lb. : find, correct to one decimal place, how many francs per kilogram he must receive for it in order to make 15 per cent. profit on the deal.

£1=124·2 francs, 1 lb.=453·6 grams.

[30 marks.]

2. A sum of £200 was invested at 6% per annum, Compound Interest. Find the Interest accumulated after six years. [Tables may be used.]

If the Interest had been added half-yearly at the rate of 3% per half-year, find the difference in the Interest as accurately as the Tables will allow.

[30 marks.]

3. The lengths of the sides of a rectangle are given as 6·25 and 4·23 metres ; calculate the area.

If the given lengths are only approximations correct to the second decimal place, find the maximum possible error in the above result.

To how many significant figures is the calculated area certainly accurate ?

[30 marks.]

4. A person's income from a $3\frac{1}{2}$% Stock is £238 per annum. When the price of the Stock is 90 he sells and re-invests the proceeds in a 5% Stock at 102. Find the difference in his income.

[30 marks.]

5. A man leaves a certain place at 12 noon and walks for 3 hours at a uniform rate of 5 miles per hour. At 12.45 p.m. a cyclist leaves the same place and travels uniformly at a rate of $12\frac{1}{2}$ miles per hour in the same direction as the first. After cycling for 42 minutes he rests for three quarters of an hour and then continues his journey at the same speed as before.

Draw a graph to represent the motion of the two men between 12 noon and 3 p.m. and use your graph to find (*a*) at what times they are together, (*b*) at what times they are 3 miles apart.

[30 marks.]

6. Give an estimate of the value of :—

$$\frac{\cdot 068034 \times \sqrt{1 \cdot 2213792}}{4 \cdot 341}$$

which will be correct to one significant figure.

[15 marks.]

Calculate $\dfrac{20 \cdot 3147235 \times 18 \cdot 855625}{6 \cdot 37142}$

correct to two decimal places, using contracted methods.

[20 marks.]

7. A closed cubical cistern of length 5 ft. is made of metal $\frac{3}{5}$ ins. thick. If it weighs $4\frac{1}{2}$ tons when full of water, find to the nearest pound the weight of one cubic foot of the metal. [See Tables, page 33.]

[35 marks.]

8. A solid is made up of a right circular cone mounted on a hemispherical base. The base radius of the cone and the radius of the hemisphere are each 2·4 feet. If the total volume is 48 cubic feet, find the height of the cone in feet, correct to two decimal places.

[35 marks.]

9. A train of length 104 yards and travelling at a uniform rate of 45 miles per hour, comes to a bridge which is 264 yards long. At the same instant another train travelling in the opposite direction comes to the other end of the bridge. If they meet after 9 seconds and if the first train clears the bridge 52 seconds before the other one does so, find the length of the second train and the speed at which it travels.

[35 marks.]