AN ROINN OIDEACHAIS

(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1944.

MATHEMATICS—Arithmetic.

MONDAY, 19th JUNE.-Morning, 10 to 12 noon.

Six questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

1. Find, to the nearest penny, the cost of 4 cwt. 1 qr. 17 lbs. at £5 14s. $3\frac{1}{2}$ d. per cwt.

[30 marks].

2. A farmer buys some stacks of hay for £594 10s, at the rate of £7 5s, per ton. He sells the hay at £7 15s, per ton but finds that 4 tons have got spoiled and for this portion of the hay he gets nothing. Find his profit per cent, correct to one decimal place.

[30 marks].

3. The depreciation in value of a motor-car is calculated as follows: on completing 5,000 miles (and every multiple of 5,000 miles) it loses $12\frac{1}{2}\%$ of the value it had at the beginning of that 5,000 miles. If its value was £300 when new, find (a) the value when it has completed 30,000 miles; (b) the mileage (to within 5,000) it has done when its value is £150.

[30 marks].

4. A person holds a Bill of Exchange for £1450 payable six months and hence. He gets the Bill discounted in a Bank at 4% per annum and invests the proceeds in a 10% Stock at 245. What will be his half-yearly dividend?

[30 marks].

5. A cylindrical vessel 8 ft. high and the diameter of whose base is 4 ft., is filled with water. It is then placed standing in an empty cubical cistern which measures 5 feet each way on the inside. If the cylindrical vessel leaks at the rate of ½ c. ft. per hour, find (to the nearest hour) when the water will be at the same level outside and inside the cylinder.

[30 marks].

[Neglect the thickness of the cylinder].

6. The following is a set of corresponding values for two quantities A and B:-

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A =	0	1	2	3	4	5	6	-
B =	1	1.38	1.90	2.63	3.63	5.01	6-91	A STATE OF THE PARTY OF THE PAR

Draw a graph, on as large a scale as possible, showing the relation between log₁₀ B and A.

What is the value of B when (1) A = 2.5; (2) A = 5.5?

[35 marks].

7. Given that $\frac{1}{\pi} = .31831$ correct to five decimal places, show that the approximation $\frac{1}{3} - \frac{1}{100} - \frac{1}{200}$ gives the value of $\frac{1}{\pi}$ correct to four places. Show that the error is one of excess and that it is less than $\frac{1}{125}\%$.

Use this approximation to find the length, in metres, of the diameter of a circular field whose circumference is 291.84 metres.

To how many places of decimals is the result certainly accurate?

[35 marks].

8. A solid circular cone of ice is 3" high and the diameter of its base is 7.6". When melted in a hemispherical bowl it just fills the bowl with water. Find the radius of the bowl correct to the nearest $\frac{1}{10}$ ", being given that:

> 1 c. ft. water = 62.5 lbs. 1 c. ft. ice = 57.2 lbs.

and that the weight of the ice is also the weight of the water.

[35 marks].

9. Using contracted methods of multiplication and division find, correct to 4 significant figures, the value of $\frac{1}{(1.031485)^3}$ The calculation throughout should be carried so far only as is necessary

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