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(Department of Education).

LEAVING CERTIFICATE EXAMINATION, 1951.

MATHEMATICS—Arithmetic.

TUESDAY, 5th JUNE,—MORNING, 10 TO 12.

All questions are of equal value.

Six questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

1. Find, to the nearest penny, the cost of repairing a road 4 mls. 7 furs. 35 pers. long, at £166 14s. 8d. per mile.

2. Find the value of each of the following, correct to two significant figures:

(a)  $\frac{(21.13)^2 - (18.35)^2}{0.3178}$ ,

(b)  $(453.6)^{1\frac{1}{2}}$ .

3. A man purchases two kinds of coal, one kind at £5 10s. per ton, and the other at £8 5s. per ton. He mixes the two kinds in equal quantities by weight and sells the mixture at £8 5s. per ton. Find his percentage profit.

In what proportion by weight should he mix the two kinds so that by selling the mixture at the same price as before his profit would be  $33\frac{1}{3}\%$ ?

4. A man invests £800 in a  $3\frac{1}{2}\%$  Stock at 105, and £700 in a 4% Stock at 96. Find his total yearly income from these investments after paying income tax at the rate of 6s. 6d. in the pound.

In what proportion should money be invested in these Stocks so that the yearly income obtained from one of them would be equal to the yearly income obtained from the other?

5. Find, correct to two significant figures, the percentage profit made by buying silk at 450 francs per metre and selling one-third of it at 8s. 6d. per yard, and the remainder at 2.15 dollars per yard.

[1 metre=39.37 inches; £1=2.83 dollars; 1 dollar=388 francs.]

6. A man purchases a car on the condition that he shall pay £200 now, £200 a year hence and £200 two years hence. Find, correct to the nearest shilling, the present value of the car if compound interest is reckoned at  $3\frac{1}{2}\%$  per annum.

7. A right circular cone is made of iron and its vertical height is equal to the diameter of its base. If a cubic foot of iron weighs 445 lb., and if the cone weighs 105 lb., find, correct to *three* significant figures, (a) the vertical height of the cone in inches, and (b) its total surface area in square inches.

8. With the waste pipe closed, two taps opened at the same time fill a bath with water in 20 minutes, but with the waste pipe open it takes them 25 minutes to fill the bath. If the bath were full and both taps closed, how long would it take the waste pipe to empty it?

If, with the waste pipe closed, one of the taps fills one-third of the bath in the same time that the other fills the half of it, find how long it takes each of the taps by itself to fill the bath, the waste pipe being closed.