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(Department of Education.)

INTERMEDIATE CERTIFICATE EXAMINATION, 1949.

MATHEMATICS (Arithmetic).

WEDNESDAY, 8th JUNE.—Morning, 10 to 12.

The total number of questions answered should not exceed *six*.
Mathematical Tables may be obtained from the Superintendent.

1. Calculate
    (*a*) the cost of 77 cwts. 3 qrs. 21 lbs. of sugar at £3 5s. 4d. per cwt.,
    (*b*) the profit made by selling the sugar at 7½d. per lb.
    [30 marks.]

2. Express :
    (*a*) 17s. 4¼d. as a decimal of £5,
    (*b*) a speed of 57 miles per hour in yards per minute,
    (*c*) in square miles the area of a district which is represented by a rectangle 72 inches long and 10 inches wide on an Ordinance map, the scale of which is 6 inches to the mile.
    [30 marks.]

3. Find, to the nearest shilling, the compound interest on £345 15s. for 2 years at $1\frac{1}{4}\%$ per annum.
    [30 marks.]

Or,

3. The simple interest on a sum of money for 5½ years at $1\frac{1}{8}\%$ per annum is £9 1s. 6d. Find the sum of money.
    [30 marks.]

4. The cost of growing an acre of potatoes is £65 10s. 5d., and the yield is 9 tons 5 cwts. If two-thirds of the potatoes are sold at 1s. 7d. per stone, find the price per stone at which the remainder must be sold so that a profit of 60% may be made on the acre of potatoes.
    [35 marks.]

Or,

4. (*a*) Find the square root of the expression $1 + \dfrac{6}{10^3} + \dfrac{9}{10^6}$;

    (*b*) From the formula, $T = 2\pi\sqrt{\dfrac{l}{g}}$, find the value of g, correct to three significant figures, when T = 2·350, l = 4·508.
    [35 marks.]

5. Water flows into a cylindrical tank at the rate of 30 gallons per minute and the level of the water in the tank rises at the rate of 1·35 inches per minute. Find the diameter of the tank to the nearest inch.

When water is poured into a second cylindrical tank at the same rate, the level of the water rises twice as fast in it as it does in the first one. Find, to the nearest inch, the diameter of the second tank.

[35 marks.]

6. A man leaves his house at 1 p.m. with the intention of walking to the railway station. After walking ¼ mile in the direction of the station at 3 miles per hour, he returns to his house at 5 miles per hour. He delays 12 minutes in the house and then sets out again for the station, this time by taxi at 20 miles per hour, arriving at the station at the same time as he would have in the first instance, had he not turned back. Draw a graph to represent his journey and find from it

(a) the distance from his house to the railway station,

(b) the time at which he arrives at the station,

(c) the time at which the taxi passes the place from which he turned back.

[35 marks.]

7. A merchant buys goods at 30% above the cost of manufacture and is charged a duty of 10% on what he pays for them. He sells the goods at a profit of 15% on his total outlay and thus gains £429. Find the cost of manufacture of the goods.

When the duty is increased by 50%, the merchant increases his selling price so that he still has a profit of 15% on his total outlay. By what percentage does he increase his selling price ?

[35 marks.]