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INTERMEDIATE CERTIFICATE EXAMINATION, 1930.

MATHEMATICS

ARITHMETIC—Paper B.

MONDAY, 16th JUNE.—MORNING 10.45 A.M. TO 12.15 P.M.

Each item (*a*), (*b*), (*c*), (*d*), (*e*) in Section I. will be counted as a *half-question*. The total number of questions answered should not exceed *five*, every pair of items from Section I. being counted as a whole question.

(Candidates should see that answers to questions in excess of *five* are cancelled.)

Mathematical Tables may be obtained from the Superintendent.

SECTION I.

(Each item (*a*), (*b*), (*c*), (*d*), (*e*) in this Section carries 15 marks.)

(*a*) Find, to three significant figures, the nearest approximation for the difference between the squares of 68·0476 and 3·90628.

(*b*) Find the cost of 269 tons at £6 17s. 4½d. per ton.

(*c*) Find the value of

$$49\tfrac{2}{3}+27\tfrac{7}{8}-4\tfrac{1}{2}\ (18\tfrac{1}{3}-9\tfrac{3}{8}).$$

(*d*) In a box there are 7 articles weighing 5 ozs. each, 18 weighing 7 ozs. each, 24 weighing 12 ozs. each and 9 weighing 14 ozs. each. Find, to the nearest tenth of an ounce, the average weight of the articles.

(*e*) The area of a square field is 3 acres. Find the area of another square field whose side is $2\frac{1}{2}$ times as long as that of the other.

SECTION II.

1. How many faces has a cube? If the total surface area of a cube is 71·34 square inches, find, with corresponding accuracy, the length of the edge and the volume of the cube.

[30 marks.]

2. A merchant from New York buys goods in Paris for 150,500 francs. At what price in dollars, to the nearest dollar, must he sell them in New York to gain 15 per cent. profit on his total outlay, if he allows 500 dollars to cover his expenses ?

(NOTE.—£1=124·01 francs=4·88 dollars.)

[30 marks.]

3. The sum of 15*s.* 6*d.* invested in a Savings Certificate becomes £1 after 5 years. Show that this is equivalent to more than 5 per cent. per annum Compound Interest. Is it equivalent to more than $5\frac{1}{4}$ per cent. per annum Compound Interest ?

(32 marks.]

4. A grocer had been making a profit of 20 per cent. by selling articles for 1*s.* 6*d.* each. When the cost price increased by 5*d.* each he altered his selling price to 2*s.* 1*d.* each. What is his new profit per cent. ?

If the number of articles sold, as a consequence of the increased prices, is reduced by 30 per cent., find whether his total profits have increased or decreased.

[32 marks.]

5. The radius of a sphere was known to lie between 4·6 inches and 4·7 inches. In calculating the volume, the radius was assumed to be 4·65 inches. Find the greatest possible error involved and the percentage error corresponding thereto.

[32 marks.]

6. The area of a triangle is given by the formula $\sqrt{s\,(s-a)\,(s-b)\,(s-c)}$ where $2s = a+b+c$ and a, b, c are the lengths of the sides. Given that the sides of a triangle whose area is 5 square inches are in the ratio 2 : 3 : 4, find the sides to the nearest $\frac{1}{10}$th inch.

[32 marks.]

7. Two men, A and B, set out together on the same route at the rates of 10 and 15 miles per hour respectively. A stops for 10 minutes at the end of each hour's journeying, but B continues for $1\frac{1}{2}$ hours, rests $\frac{3}{4}$ hour and returns at a uniform speed, meeting A just when he is leaving his second stopping place. Illustrate their journeys graphically, and hence find the total time spent by B on his outing and the speed at which he returned.

[32 marks.]