

Examination Department

146TH EXAMINATION

ADVANCED ARITHMETIC

Monday, June 14, 1897—9:15 a. m. to 12:15 p. m., only

100 credits, necessary to pass, 75

Answer 10 questions but no more. If more than 10 questions are answered only the first 10 of these answers will be considered. Division of groups is not allowed. Give each step of solution, indicating the operations by appropriate signs. Use cancelation when possible. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 10 credits.

1 Define antecedent, circulating decimal, continued fraction, mean proportional, exact interest.

2 Change 6432 in the decimal scale to an equivalent number whose scale is 7.

3 Simplify $\frac{23\frac{1}{7} - 2[4 - 3(2 + \frac{1}{2} \times \frac{3}{7}) + 1]}{4 - \{1 + [1 - (1 + 1) + 1] + 1\}}$

4 Prove that if any integral number is divided by 9 the remainder will be the same as that resulting from dividing the sum of the digits by 9.

5 Multiply 42.35 by 3.14159, using the contracted method and finding the result correct to two decimal places. Prove the work by division, using the contracted method.

6 Can $\frac{1}{15}$ be exactly expressed as a decimal? Give full analysis of the work.

7 Divide $\frac{3}{4}$ by $\frac{5}{7}$ and demonstrate the correctness of the work.

8 Give the French unit corresponding most nearly in its use to (a) inch, (b) yard, (c) mile, (d) pound, (e) quart. Mention the chief advantages and disadvantages of the metric system.

9-10 A ship's chronometer, which gains $1\frac{1}{2}$ seconds a day, was set by Greenwich time at noon September 1, 1896; when it was mean noon March 15, 1897, as determined by observation, the chronometer indicated 1 hour 10 minutes 15 seconds before noon. Find the longitude of the ship.

11 Convert \$500 United States gold into (a) British money, (b) French money, (c) German money, allowing $\frac{1}{8}\%$ brokerage in each case.

12 A merchant buys goods which at list prices cost \$800, getting discounts of 20, 10 and 5 with 60 days credit, or a further discount of 5% for cash; how much will he gain by borrowing at 6% money to pay the bill?

13 Find the cost of a 60 days sight draft on London for £150, exchange being at $1\frac{1}{2}\%$ discount, money worth 6%, brokerage $\frac{1}{4}\%$.

14 Extract the cube root of .3 to three decimal places.

15 Find the sum of 10 terms of the series 4, 6, 9, etc.