University of the State of New York

Examination Department

131st examination

ADVANCED ARITHMETIC

Monday, June 10, 1895 — 9 : 15 a. m. to 12 : 15 p. m., only

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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 and illustrate *uniform scale, varying scale, partitive proportion, circulating decimal* (*repetend*), *root.*

2–3 Prove that a number is divisible by 9 when the sum of its digits is divisible by 9.

4 Prove that any common divisor of two numbers is a divisor of their sum and of their difference.

5–6 Derive a method of finding the greatest common divisor of two fractions.

7 Given interest, principal and time, how may the rate be found? (Give reasoning in full.)

8 State with illustrations *two* important advantages of the metric system over the common system.

9–10 Show your knowledge of the use of signs by indicating the solution of the following: A man earns $37.50 a month for 10 months and $50 a month for 9 months; he invests his earnings in railway stock at 75; the stock pays a dividend of 4% and the money thus received is divided among his children, each receiving as many dollars as there are children; how many children are there?

11–12 Loaned $6000 to be paid with interest at 6% in six equal annual instalments; what is the amount of each payment?

13 The length of a tank which holds 100 barrels of water is twice its hight and its hight twice its width; find its dimensions to the nearest inch.

14–15 Find the volume and the entire surface of a square pyramid the side of whose base is 2 feet and whose slant hight is 6 feet.