*University of the State of New York*

# Examination Department

### 127th examination

## ADVANCED ARITHMETIC

**Monday,** January 21, 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.*

1-2 A merchant measures out to a customer 4 quarts of beans, using a liquid gallon measure ; assuming that beans should be sold by dry measure, what is the customer's gain or loss per cent?

3 A man loans $\frac{1}{2}$ his money at 6%, $\frac{1}{3}$ at 4%, and the remainder at $4\frac{1}{2}$% ; his whole income is $305 ; how much money does he loan?

4-5 A bar of aluminum 2 centimeters thick and 2 centimeters wide weighs $1\frac{1}{2}$ kilograms ; find its length, assuming that aluminum is $2\frac{1}{2}$ times as heavy as water.

6-7 Explain a method of finding difference of longitude from difference of time, and show its application in finding the longitude of a place.

8-9 Write the formula for finding the sum of a geometric progression, having given the first term, the ratio and the number of terms. Show the application of the formula by finding the exact value of the decimal .666 . . . to infinity.

10-11 A 2 inch pipe discharges 150 gallons of water a minute under a head of 4 feet ; how much will be discharged by a 4 inch pipe under a head of 20 feet? (Assume that the discharge varies directly as the cross section of the pipe and as the square root of the head. Solve by proportion.)

12-14 State the process of finding the cost in United States money of a time draft on a foreign country, giving the reasons for each step.

15 Find the entire surface of a right pyramid whose base is 4 inches square and whose altitude is 6 inches. (Carry work to *two* places of decimals.)