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University of the State of New York

Examination Department

135TH EXAMINATION

ADVANCED ARITHMETIC

Monday, March 23, 1896—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 *standard unit, power, compound proportion, partnership, geometric series.*

2–3 Find the sum of $\frac{3}{5}$ and $\frac{3}{4}$, explaining fully each step of the operation.

4 At an election 510 votes were cast for two candidates; $\frac{2}{3}$ of those cast for one equaled $\frac{3}{4}$ of those cast for the other. How many votes were cast for each candidate?

5 If the cost of an article had been 8% less, the gain would have been 10% more; what was the gain per cent?

6 Prove that the sum of any two consecutive whole numbers is equal to the difference of their squares.

7 A cistern has three pipes, *a*, *b* and *c*; if *a* and *b* were open the cistern would be filled in 72 minutes; if *a* and *c* were open it would be filled in 3 hours; if *b* and *c* were open it would be emptied in 72 minutes. Find the time required for each pipe to fill or to empty the cistern.

8–9 A sells a certain amount of 5% stock at 86 and invests in 6% stock at 103; by so doing his income is changed $1. What amount of stock did A sell? Was his income increased or diminished?

10 How was the principal unit of the metric system determined? Explain the relation between this unit and the metric units of capacity and weight.

11–12 Multiply 27.3782 by 4.326, using the method of contracted multiplication of decimals. Retain *three* decimal places in the product.

13 Prove by a general method that if four numbers are in proportion the product of the extremes is equal to the product of the means.

14 An 8% dividend on stock purchased at par was invested in the same stock at 80; the investment then amounted to $6480. What was the amount of the dividend?

15 Find the cube root of 4.080659192.