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University of the State of New York

Examination Department

132D EXAMINATION

ADVANCED ALGEBRA

August 1895—Three hours, 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. 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 mantissa of a logarithm, harmonic progression, numeric equation, cubic equation, combination.

2–3 Prove that a quadratic equation can have only two roots.

4 Show that if any four quantities are in proportion they will be in proportion by composition or by division.

5 How many different combinations can be formed of 12 letters taken 9 at a time?

6–7 Develop into a series by means of undetermined coefficients $\sqrt[3]{1+x^3}$. (Find terms.)

8–9 Find by means of the binomial formula the cube root of 28 correct to three places of decimals.

10 The logarithm of 64 is 1.80618; find the logarithm of 640, of 0.64, of 8, of 2, of 128.

11–12 Show how to transform a complete equation into one whose second term is wanting.

13–14 State and prove *Descartes' rule of signs.*

15 Find all the commensurable roots of $x^5-2x^3-16=0$