

University of the State of New York  
**Examination Department**  
 127th examination  
**ALGEBRA**

**Wednesday, January 23, 1895—9 : 15 a. m. to 12 : 15 p. m., only**

100 credits, necessary to pass, 75

*Answer questions 1-5 and five of the others but no more. If more than five of these other questions are answered only the first five 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 *exponent, surd, numeric equation, elimination, degree of a term.*

2 Simplify  $b^2 \left( \frac{a}{b} + \frac{a+b}{a-b} \right) \left( \frac{a}{b} - \frac{a-b}{b-a} \right)$

3-4 Solve 
$$\begin{cases} 2ax - 3by = b - a(b+3) \\ \frac{x}{a} + \frac{y}{b} = 2 + \frac{a+b}{ab} \end{cases}$$

5 Solve  $x^2 + bx = a(x+b)$

6 Factor  $a^2 - a - 6, 2x^2 - 3xy - 2y^2, 9x^2 - y^2, 2x^4 + 2x^2y^2 + 2y^4, x^8 - 1$

7 State and illustrate the principle (axiom) underlying (a) clearing of fractions, (b) transposition of terms.

8 Divide  $2x^4 + x^3y - 6x^2y^2 - 2xy^3 + y^4$  by  $x^2 - xy - y^2$

9-10 Solve 
$$\begin{cases} x^2 + y^2 = 5 \\ xy + y^2 = 6 \end{cases}$$

11 Solve  $\sqrt{x+4} - \sqrt{x-3} = 1$

12-13 The length of a certain rectangle is to its width as 8 to 5 and the number of square feet in its area is equal to the number of linear feet in its perimeter less three. Find its length and width.

14-15 Find the amount of  $p$  dollars at  $r$  per cent simple interest for  $m$  years and  $n$  months.