University of the State of New York

Examination Department

151ST EXAMINATION

ALGEBRA

Thursday, March 24, 1898—9:15 a. m. to 12:15 p. m., only

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100 *credits, necessary to pass,* 75

Answer the first five questions and five of the others but **no more.** *If more than five of the others are answered only the first five 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 *polynomial, similar terms, homogeneous quantity, radical, surd.*

2 Simplify $a-[2b+3a-(3b-2a-\overline{a+b}+2a)-b-3a]$

3 Simplify $\left(\frac{x}{1+x}+\frac{1-x}{x}\right)\div\left(\frac{x}{1+x}-\frac{1-x}{x}\right)$

4 Solve $cx+by=3bc$

$2bx+cy=2(b^2+c^2)$

5 Solve $4x^2+\frac{2x}{a}=\frac{2}{a^2}$

6 Factor

$16+4x^2+x^4$, $27a^3-b^3$, a^4-b^4, $x^{3m}+y^{3n}$, $2x^2+3xy-2y^2$

7 Simplify $\frac{1}{2a+b}\sqrt{4a^2b+4ab^2+b^3}$, $2\sqrt[3]{16a^3b^4c^5}$, $\frac{a}{b}\sqrt[5]{\frac{32a}{b^5}}$, $\sqrt{a}\times\sqrt[3]{a}$

8 Find the square root of $\frac{a^2}{4}+b^2+\frac{c^2}{4}+ab-\frac{ac}{2}-bc$

9 Expand by the binomial theorem $\left(\frac{a}{2}-\frac{2}{b}\right)^5$

10 Reduce to its lowest terms $\frac{6x^2-x-1}{3x^3+4x^2+4x+1}$

11 The difference of two numbers is 2 and the sum of their squares is 100; find the numbers.

12 Solve $\sqrt{x+1}+\sqrt{x-2}=\sqrt{2x+3}$

13–14 Solve $2x^2+3xy=32$

$3y^2-4xy=16$

15 The perimeter of a rectangular lot is 220 feet and its area is 2925 square feet; find its length and breadth.