University of the State of New York

76TH EXAMINATION

ALGEBRA

THURSDAY, March 5, 1891—9:15 A. M. to 12:15 P. M., only

40 *credits, necessary to pass,* 30

1. Define (*a*) an algebraic expression; (*b*) a literal equation; (*c*) the coefficient of a term; (*d*) the degree of a term. Give an example of each. 4

2. Translate into algebraic language, the square of the difference of two numbers subtracted from the square of their sum equals four times their product. 1

3. Write within minus parentheses, without change of value or order, $a^2 - ab - ac + b^2 - bc + c^2$, regarded (*a*) as three binomials; (*b*) as two trinomials. 2

4. Given $6x^2 + 37x + 35$ and $3x^2 + 17x + 10$; find, by the method of division, (*a*) the highest common factor; (*b*) the lowest common multiple. 4

5. Simplify $\dfrac{5m^6n - 5n^7}{m^2n + 2mn^2 + n^3} \div \dfrac{m^2 - mn + n^2}{m + n}$ 3

6. Solve (1) $(x - a - b)^2 - (x - a)(x - b) + ab = 0$ 3

(2) $\dfrac{3}{x} + \dfrac{1}{y} = \dfrac{5}{4}$ and $\dfrac{2}{x} - \dfrac{3}{y} = -1$ 3

7. A man has two kinds of money, dimes and half dimes. If he is offered \$1.35 for 20 coins, how many of each kind must he give? 2

8. Expand $(3a^2 - b^3)^5$. State how the signs of the terms are determined. 4

9. Find the cube root of $45x^2 - 30x^4 - 27 + 12x^5 + 27x^4 - 8x^6 - 35x^3$. 3

10. A rows *a* miles down stream in *b* minutes and returns in *c* minutes. Find A's rate of rowing in still water; also the rate of the current. 2

11. Solve $\dfrac{x+4}{x-4} - \dfrac{x-4}{x+4} = 4\frac{4}{5}$. 2

12. Form an equation whose roots are 2 and $-\frac{4}{3}$. 1

13. A merchant received \$12 for a number of yards of linen, and an equal sum, at 50 cents a yard less, for a number of yards of cotton. The cotton exceeded the linen by 32 yards. How many yards of each did he sell? 4

14. Simplify (*a*) $8\sqrt{12} \times 3\sqrt{24}$; (*b*) $5\sqrt{27} \div 3\sqrt{24}$. 2