University of the State of New York

Examinations Department

78th examination

ALGEBRA

Wednesday, Nov. 25, 1891—9 : 15 a. m. to 12 : 15 p. m., only

48 credits, necessary to pass, 36

Give each step of solution. Express final result in its simplest form and mark it *Ans.*

1. Distinguish between (*a*) independent equations and simultaneous equations; (*b*) a radical and a surd. Give examples illustrating each answer. 4

2. Let $-a$ and $+b$ each represent a quantity. Find (*a*) their sum; (*b*) their difference; (*c*) their product; (*d*) their quotient. State why you consider each result obtained correct. 4

3. Reduce to lowest terms (*a*) $\frac{x^4+x^2}{x^4-1}$; (*b*) $\frac{a-3}{9-a^2}$. 4

4. Reduce to a fractional form $\frac{x^4-x^2-1}{x^2+x+1}-(x-x^2-1)$. 3

5. Simplify $\frac{a+x}{a-x}-\frac{a-x}{a+x}$. 2

6. Solve the equations,

(*a*) $(x-a)(x-b)+(a+b)^2=(x+a)(x+b)$. 3

(*b*) $\frac{9}{x}-\frac{5}{y}=2$, and $\frac{5}{x}+\frac{3}{y}=30$. 4

7. Expand by the binomial theorem $(2a^3-3b^2)^5$. State the method of finding the coefficients of the terms and the exponents of their literal factors. 5

8. A rows *m* miles down stream in *b* hours and returns in *c* hours. Find A's rate of rowing in still water and the rate of the current. 4

9. Solve the equations,

(*a*) $\frac{2x^2-8}{7}-3x+7=\frac{x-3}{3}$. 3

(*b*) $x+\sqrt{xy}+y=7$ and $x^2+xy+y^2=21$. 4

10. Reduce to simplest form,

(*a*) $3\sqrt{5}-4\sqrt{2}$ multiplied by $2\sqrt{5}+3\sqrt{2}$. 3

(*b*) $21\sqrt{384}$ divided by $8\sqrt{98}$. 2

11. Find two numbers which are to each other as 4 to 3 and whose product increased by their sum equals 62. 3