University of the State of New York

77TH EXAMINATION

ADVANCED ARITHMETIC

TUESDAY, June 9, 1891—9 : 15 A. M. to 12 : 15 P. M., only

---

60 *credits, necessary to pass,* 45

NOTE.—Give each step of solution, indicating the operations by appropriate signs. Use cancellation when possible. Reduce fractions to lowest terms. Express final result in its simplest form and mark it *Ans.*

1. Reduce 117 and 53 to the quinary scale of notation, multiply them together in that scale, reduce the product to the denary (decimal) scale, and check by comparison with the product found in the ordinary way.   6

2. Is 1147 a prime number? Define *prime number* and prove that your answer is correct.   3

3. To what is the least common multiple of two or more numbers equal? How does a multiple differ from a product? From a dividend?   4

4. Show, *without making it a dividend,* whether 82,345,676 is a multiple of 3. Of 4. State the principle underlying the latter process.   4

5. Prove that in finding a fraction of a fraction (e.g. $\frac{2}{3}$ of $\frac{5}{7}$) the product of the numerators must indicate the number of the parts in the result, and the product of the denominators must show the name of those parts. Illustrate by actually dividing a line or a circle on your paper.   5

6. How many decimal places in the product of 0.00037, 100, and 3.333? Give reasons for your answer.   4

7. This question paper is about 20 centimetres long by 12.5 centimetres wide Express each of these dimensions in three other ways by the metric system. Express them also in inches.   4

8. A's money is $\frac{2}{3}$ of B's; give $40 to each and A's will be $\frac{5}{7}$ of B's. How much has each?   4

9. What per cent of the letters in the first ten words of this question are *e*'s? Define *per cent* and show that your definition applies to this case.   3

10. A bookseller buys books at " 10% and 5% off " from " net " prices and sells at 20% advance on " net " prices. What % profit does he make after deducting 10% from his sales for expenses?   5

11. Find the face of a 2-months' note, dated and discounted this day, that would yield at bank $4500, discounted at 6% for the exact number of days including grace, on a basis of 360 days to the year. Write such a note.   5

12. Find the " present worth " of the note just written, and account for the difference between that sum and the $4500.   4

13. How many cubic inches does a pail contain that is one foot in diameter at the top, 10 inches at the bottom, and $9\frac{1}{2}$ inches deep? How many quarts (liquid) ?   5

14. What is the ratio (correct to the third decimal place) of the length of any solid to the length of another solid of the same shape, but of ten times the size of the former?   4