

Examination Department

154TH EXAMINATION

ADVANCED ARITHMETIC

Monday, June 13, 1898—9:15 a. m. to 12:15 p. m., only

100 credits, necessary to pass, 75

Answer 10 questions but no more. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Give each step of solution, indicating the operations by appropriate signs. Use cancelation when possible. 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 factor, cancelation, circulating decimal, brokerage, geometric series.

2 Change 321302 in the quaternary scale to the decimal scale.

3 Multiply 67.1893 by 38.10945 and divide the product by 3.1692 , finding the result correct to two decimal places and using the contracted methods of multiplication and division of decimals.

4 Write a brief account of the Julian calendar (old style). Mention a country where it is still in use.

5 Give the English unit corresponding most nearly to the (a) centimeter, (b) kilogram, (c) meter, (d) liter, (e) kilometer. Discuss the merits of the metric system.

6 Show that 24 is a factor of the product of any three consecutive numbers if the middle one is odd.

7 If the same number is added to both terms of a proper fraction how is the value of the fraction affected? Prove.

8-9 Find the cube root of 9745491.456 , giving a geometric interpretation of the first complete divisor.

10 The first term of an arithmetic progression is 3, the last term is 13 and the number of terms 5; find (a) the common difference, (b) the sum of the terms.

11 A bookseller sells books at 25% profit but allows teachers a discount of 10%; if he receives \$27 from a teacher in payment of a bill what is his profit?

12 Find the cost of a 60 days sight draft on Paris for 2500 francs at 5.16, money worth 5%, brokerage $\frac{1}{4}\%$.

13 A man whose invested capital yields 12% gives up his business and lends his money at $5\frac{1}{2}\%$; his income falls off \$5200. What is his capital?

14 A merchant gains $a\%$ on his investment by rise of value and then $b\%$ on the amount by retail trade; would the result be the same if he had gained $b\%$ first and then $a\%$? Prove.

15 When it was 9:30 in Albany this morning it was 2:24 p. m. at Greenwich; what is the longitude of Albany?