

## Examination Department

143D EXAMINATION

## ADVANCED ARITHMETIC

Monday, March 22, 1897—9:15 a. m. to 12:15 p. m., only

100 credits, necessary to pass, 75

Answer 20 questions but no more. If more than 20 questions are answered only the first 20 of these answers will be considered. Plans of groups is not allowed. Give each step of solution, indicating its operations by appropriate signs. Use cancellation when possible. Reduce fractions to lowest terms. Express final result in its simplest form and mark it *Ans.* Each complete answer will receive 25 credits.

- 1 Define decimal, root, power, fractional unit, arithmetic series.
- 2 Express in the roman notation three million eight hundred thousand seven hundred forty nine.
- 3 Determine in what scale of notation 4954 is expressed by 20305.
- 4-5 Explain the method of finding by division the greatest common divisor of two numbers. Give reasons in full.
- 6 Demonstrate the usual rule for multiplying one fraction by another.
- 7 Prove that if two numbers are divided by 9 and the product of their remainders is also divided by 9, the remainder thus obtained is equal to the remainder that results from dividing the product of the two original numbers by 9.
- 8 A man travels 5 miles the first day and increases his distance uniformly each day till on the 11th day he travels 45 miles; find the entire distance traveled and each day's increase.
- 9 Divide 790.735197 by 32.4687, using the contracted method of division of decimals and extending the quotient to two decimal places.
- 10 Find two consecutive numbers the difference of whose squares is 51.
- 11 Find the number of terms of a geometric series whose third term is 20, whose eighth term is 640 and whose sum is 20475.
- 12 If the radii of three spheres are 9, 12 and 15, what is the radius of the sphere whose volume is equivalent to the sum of the volumes of these three spheres?
- 13 A man borrows \$4500 and agrees to pay principal and interest in four equal annual instalments; if the rate of interest is 6%, what will be the amount of each annual payment?
- 14-15 Find the cube root of 14706125 and explain each step in the process, using diagrams to illustrate if desired.