High School Department

178TH EXAMINATION

ADVANCED ARITHMETIC

Monday, June 15, 1903 — 9.15 a. m. to 12. 15 p. m., only

Answer eight questions but **no more.** *If more than eight are answered only the first eight answers will be considered. Give each step of solution. Express final result in its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.*

1 Define mixed circulating decimal, standard time, specific duty, present worth, geometric series.

2 Find the product of 4.397 and 99.999 to *three* decimal places by *two* different methods of contracted multiplication.

3 State the principle applied in testing the divisibility of any number by *each* of the following numbers, without dividing it by them: 4, 5, 9. Demonstrate in each case the principle applied.

4 State a method of finding the sixth root of any number and demonstrate the correctness of the method. Find the sixth root of 1544.804416.

5 Prove that the product of any three consecutive numbers is divisible by 6.

6 Find the cost, @ $25 per M, of 30 pieces of lumber 20' long, 21" wide at one end and 17" wide at the other, and 1½" thick.

7 A druggist bought brandy @ $3 a gallon and after adding water, sold the mixture @ $3 a gallon, gaining 50%; find what per cent of the mixture was water.

8 A man sells two articles at the same price; on one he gains r%, on the other he loses r%. Does he gain or lose on the whole transaction? Give proof.

9 A man bought c shares of stock at par and sold them at b% discount, brokerage in each case being a%; find his loss on the transaction.

10 A pendulum 99 centimeters long makes 60 vibrations a minute; how long must a pendulum be to make 72 vibrations a minute? [The lengths of pendulums are inversely proportional to the squares of their numbers of vibrations.]

11 Find the extremes of an arithmetic progression of 9 terms whose sum is 243 and whose common difference is 6.

12 Find the face of a 60 day draft on New York, purchased in Boston for $659.85, exchange being ¾% premium and money being worth 6%.