196TH HIGH SCHOOL EXAMINATION

ADVANCED ARITHMETIC

Monday, September 14, 1908—9.15 a. m. to 12.15 p. m., only

Answer eight questions, selecting two from each group. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.

Group I

1 Prove that the product of any three consecutive numbers is divisible by 6. Under what conditions is this product divisible by 24? [Illustration not sufficient.]

2 Prove *each* of the following:

a A number is divisible by 4 if the number expressed by the two right hand figures is divisible by 4.

b A number is divisible by 5 if its right hand figure is 0 or 5.

3 Find the prime factors of 46,656; from these factors determine the square root, the cube root and the sixth root of the number.

Group II

4 In what time will the interest on £57 1s 8d, at 7½%, amount to £2 11s 4½d?

5 If milk is reduced in value from 24¢ a gallon to 20¢ a gallon by the addition of water, how many quarts of water have been added to produce 40 quarts of such adulterated milk?

6 Assuming that a boy can do only half as much work as a man, state how many hours a day 42 boys must work to accomplish as much in 45 days as 27 men, working 10 hours a day, would accomplish in 28 days. [Solve by analysis.]

Group III

7 Write, with reasons, a full explanation of the six per cent method of computing interest.

8 If I deposit $1 in the bank on January 1, 1909, $2 on January 8, and if each succeeding week I double the last amount deposited, what sum will I place in the bank on April 2, 1909? What will be my bank account on this date? [No credit allowed unless solved by geometric progression.]

9 Find the least whole number that is exactly divisible by 4⅓, 3⅓, 4⅔. Give explanation.

Group IV

10 A round cistern 4 ft in diameter requires the same amount of sheet lead for lining as a cubic cistern whose edge is 4 ft, both being open at the top. Find (*a*) the depth of the round cistern, (*b*) the capacity in gallons of each cistern.

11 Find in square meters the area of the surface of a globe whose diameter is 6 decimeters.

12 Find the cost, at 60¢ a cubic yard, of excavating a trench 150 ft long, 15 ft wide at the top, 12 ft wide at the bottom and 5 ft deep.