192D HIGH SCHOOL EXAMINATION

ADVANCED ARITHMETIC

Tuesday, June 18, 1907 — 9.15 a. m. to 12. 15 p. m., only

Answer eight questions, selecting at least one from each group. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans.

Group I 1 Prove that the number of decimal places in the product of two factors equals the number of decimal places in both factors.

2 Explain why the square root of a fraction is greater than the fraction itself.

3 A sea captain sailed from London with Greenwich time. On a certain day he observed that his chronometer had lost 2 hours 45 minutes 30 seconds, compared with the sun. Find his longitude at the time of the observation. Explain fully.

Group II 4 At an election 1300 votes are cast for two candidates; $\frac{4}{5}$ of the number cast for one is $1\frac{2}{3}$ of the number cast for the other. Find the number of votes cast for each candidate.

5 Find the weight in kilograms of a bar of iron 2 meters long, having a rectangular cross section of 8 centimeters by 12 centimeters, iron being 7.8 times as heavy as water.

6 A contractor undertakes, with 70 men, to perform a piece of work in 130 days; at the end of 90 days 25 men leave. How many days will it take the remaining men to finish the work.

Group III 7 From a 40 gallon cask containing 32 gallons of wine and 8 gallons of water, 5 gallons were drawn and the cask was refilled with water; find the per cent of wine in the resulting mixture.

8 A having lost 25% of his capital is worth as much as B who has just gained 15% on his capital; B's capital was originally $5000. What was A's capital originally?

9 What dividend must stock pay that the rate of interest shall be $4\frac{4}{35}\%$, provided the stock can be bought for $103\frac{1}{8}$?

Group IV 10 If 100 tickets are numbered consecutively from 1 to 100 inclusive and each is sold for as many cents as the number it bears, how much money will be realized?

11 Find in inches the depth of a cylindric tank 5 feet in diameter that has the same capacity as a rectangular cistern 8 feet square and 6 feet deep.

12 A map is so drawn that a linear inch represents $\frac{8}{10}$ of a mile on the surface of the earth. How many acres of land are represented by a portion of the map 3 inches square?