ADVANCED ARITHMETIC

Monday, January 22, 1900 — 9.15 a. m. to 12.15 p. m., only

Answer 10 questions but no more. If more than 10 are answered only the first 10 answers will be considered. Give each step of solution. Express final result in its simplest form and mark it Ans. Division of groups is not allowed. Each complete answer will receive 10 credits Papers entitled to 75 or more credits will be accepted.

1 Define *five* of the following: *integer, radix, bullion, proceeds, evolution, ad valorem duty, usury.*

2 Change 200,332 in the quinary scale to an equivalent number in the decimal scale and prove the work.

3 Reduce to a common fraction .39285714

4 How was the length of the meter originally determined? State *a*) *three* countries in which the metric system is used commercially, *b*) the advantages of the metric system.

5 How many kilograms of water are required to fill a tank 2 meters deep whose base is a regular hexagon .4 meters on each side?

6 A sphere of lead 6 inches in diameter is melted and cast into a cylinder 4 inches in diameter; find the cylinder's hight.

7 When it is 8 p. m. at Manila, longitude 121° east, what time is it at Washington, longitude 77° 2′ 48″ west?

8–9 Extract the cube root of 47 to *three* decimal places. Give a clear geometric explanation of the method used.

10 A, B and C form a partnership. A invests his capital for 8 months and receives ⅔ of the profits; B invests his capital for 12 months; C invests $4000 for 6 months and receives ⅙ of the profits. Find the capital invested by A and B.

11 On Nov. 1, 1899 a speculator buys stock whose par value is $20,000 at 109⅜; on Jan. 19, 1900 he sells the stock at 111¼. Find his gain or loss, if brokerage is ⅛% and money worth 6%.

12 A merchant buys goods listed at $2500, getting successive trade discounts of 20, 10 and 5; he sells the goods at 20% above the cost price, taking in payment a note at 60 days without interest; he then gets the note discounted at 6% and pays his bill. Find his entire gain.

13 A New York clothier buys 200 cases of goods in London at £25 a case, exchange being at 4.87¾; the freight charges are $3.50 a case and the duty is 30% ad valorem. Find the per cent of gain if the goods are sold at $175 a case.

14 Jan. 1 a merchant buys goods on credit as follows: $250 due in 2 months, $400 due in 3 months, $375 due in 4 months; find the equated time of payment.

15 A person deposits $100 a year in a savings bank that pays 4% interest compounded annually; how much money stands to his credit immediately after the fifth deposit?