BOTANY.

Examiners: J. J. Mackenzie, B.A.; John Seath, B.A.

NOTE.—Candidates will take the first four questions and any one of the last three.

1. Describe fully and accurately the plant submitted, and illustrate your description by a floral diagram.

2. Illustrate by drawings the forms and the venation of the foliage leaves of the plant submitted.

3. Classify and name the plant. Mention some common Canadian plants which are related to it.

4. Draw a cross section and a longitudinal section of the ovary, and name the parts shown in your drawing. Make your drawing on a scale of one inch in diameter.

5. Show in what points an onion bulb differs from a potato tuber, and in what points they are similar.

6. Compare the floral envelopes of Hepatica, Aster, and Bellwort (Uvularia).

7. What is meant by placentation? Give four examples of Canadian plants in which different forms occur, and illustrate by drawings.

ARITHMETIC.

Examiners: J. F. White; W. H. Ballard, M.A.

NOTE.—Candidates will take the first four questions and any five of the others.

1. (*a*) Simplify $\frac{\cdot 5 \times \cdot 006}{1\frac{9}{5} \text{ of } \frac{1}{8} \times (\frac{1}{4})^2} + \frac{\frac{1}{5} \text{ of } \frac{1}{6} \times (\frac{2}{3})^2}{1\cdot 6 \times \cdot 625}$ (Answer in fractional form.)

(*b*) Find the average, correct to four places of decimals, of $12\frac{1}{8}$, 21, $7\frac{3}{4}$, ·034, 3·125, 0, 24·58 and $12\frac{9}{10}$.

NOTE.—No marks will be allowed for either (*a*) or (*b*) except the answer be perfectly correct.

2. In what time will $30441 gain $2210.10 if, at the same rate, the gain on $27944.10 for 1 year and 15 days is $2596.92? What is the rate per cent. per annum (365 days to a year)?

3. A house that cost $15,500 rents for $155 a month. It is insured for $10,850 at $\frac{1}{2}$ per cent. yearly; the taxes are 15 mills on an assessment of $12,450, and $346.45 is spent each year on repairs. What rate of interest does the investment pay?

4. A rectangular field, whose width is $\frac{3}{4}$ of its length, contains 15 acres, 123 per. In going from one corner to the opposite how much shorter is it to take the diagonal than to go around the two sides?

5. A note of $2,450, dated Halifax. June 1st, 1886, for 4 months, bearing interest at 6 per cent., is discounted at a bank on Aug. 15th at 8 per cent. Find the proceeds.

6. A farm cost $3\frac{3}{4}$ times as much as a house; by selling the house at 10 per cent. loss and the farm at $7\frac{1}{2}$ per cent. gain, $3,993.30 is received. Find cost of each.

7. Bought 64 yards of cloth at $5.70 per yard. If it shrank 5 per cent in length, find the selling price per yard to gain 20 per cent.

8. *A* and *B* are partners, *A's* capital being $\frac{2}{3}$ of *B's*. At the end of 5 months *A* withdraws $\frac{1}{4}$ of his capital, and at the end of 9 months *B* withdraws $\frac{1}{5}$ of his. How should they divide a gain of $4,222.33 at the end of the year?

9. A man sold his 5 per cents. at 78 and invested the proceeds in 6 per cents. at 104. His change in income being $385, find how much 5 per cent. stock he had.

10. A dealer shipped 400 bushels wheat at $1.40, 800 bushels at $1 62½, and 300 bushels at $1.20 to his agent, who sold the first at 20 per cent. gain, the second at 15 per cent. gain, and the third at $4\frac{4}{5}$ per cent. loss. The agent's commission was 3 per cent., and other charges were $83.44; find the dealer's gain per cent.

11. What is the cost of boards, at $1 for 50 sq. ft., to make a closed box 7 ft. 10 in. long, 3 ft. 8 in. wide, 2 ft. 6 in. high (outside dimensions), the boards being 1 inch thick?

12. Reckoning a pint to be 30 cub. in.; if 462 gals. are taken out of a cylindrical cistern 7 ft. in diameter, how many inches will the surface of the water be lowered? ($\pi = 3\frac{1}{7}$.)