7. Divide \$4.941 among A, B and C, so that nine months' interest on A's share at $3\frac{1}{2}$ per cent. per annum, nine months' interest on B's share at $3\frac{3}{2}$ per cent., and nine months' interest on C's share at $4\frac{1}{2}$ per cent. may all be equal. Ans. $\$182\frac{1}{2},\$1.701,$ $\$1.417\frac{1}{2}$. [15.]

3. I owe a man \$850 and give him my note at 90 days; what must be the face of the note to pay the exact sum, if discounted at 1¹/₄ per cent. a month (bank discount)? Ans. \$851.874. [15.]

9. A and B engage in trade. A invests \$6,000 and at the end of 5 months withdraws a certain sum. B invests \$4,000 and at the end of 7 months \$6,000 more. At the end of the year A's gain is \$5,800 and B's is \$7,800 Finu the amount A withdrew. Ans. \$4,000. [15.]

10. (1) If a brick 8 inches long 4 inches wide and 2 inches thick weighs 5 lbs., what will be the weight of a brick of the same material 16 inches long, 8 inches wide and 4 inches thick? Ans. 40 lbs. [9.]

(2) The top of a ladder reaches to the top of a wall when its foot is at a distance of 10 ft. from the bottom of the wall, but if the foot of the ladder be drawn 4 ft. farther from the wall the top of the ladder will reach a point 2 ft. below the top of the wall. Find the length of the ladder. Ans. 26.92 ft. [12.]

Third Class.

ALGEBRA.

Examiner-J. C. Glashan.

1 Simplify

 $a^{2} + b^{2} + c^{2} - (a - b + c)(a + b - c)$

-(b-c+a)(b+c-a) - (c-a+b)(c+a-b).

Ans. 2 $(a^{2} + b^{2} + c^{3} - bc - ca - ab)$. [8.] 2. Divide $a^{4} + b^{4} + c^{4} - 2b^{2}c^{2} - 2a^{2}c^{3}$

2. Divide $a^{-} + b^{-} + (-2b)^{-} - 2a^{-}t^{-} - 2ab^{-}t^{-} - 2ab^{-}t^{-}$

Ans. $x^n + 2x^{n-3} + x^{n-6} + x^6 - 1$. [8.]

4. Find the factors of

 $a^2 - b^3 + c^3 - d^2 + 2ac - 2bd.$ Ans. (a+b+c+d)(a-b+c-d). [8.]

5. Find the factors of

 $(a+b)^{2} - (b-c)^{2} + (c+a)^{2}$. Ans. 2 (a+c)(a+b). [8.] 6. Simplify

$$\frac{\frac{1}{x} - \frac{2}{x+c} + \frac{1}{x+2c}}{\frac{1}{x} - \frac{3}{x+c} + \frac{3}{x+2c} - \frac{1}{x+3c}}$$
 Ans. $\frac{x+3c}{3c}$ [12]

7. Find the value of x that will satisfy the equation m(x-m) + n(x-n) = 2mn.

Ans. x = m + n. [10.] 8. Determine x given

$$4^{\{(x-a)(x-b)-(x-c)(x-d)\}} = (d-c)^{*} - (b-a)^{*}. [12.]$$

9. Solve the simultaneous equations

$$\frac{1}{x} + \frac{2}{y} = 8, \quad Ans. \quad \frac{x = -\frac{1}{2}}{y = \frac{1}{2}}, \\ x + 2y = xy. \quad y = \frac{1}{2}. \quad [12.]$$

10. A drover bought 12 oxen and 20 sheep for \$1340; he afterwards bought 10 oxen and 26 sheep for an equal sum, paying \$8 each more for the oxen and \$3 each more for the sheep. What was the price per ox and what the price per sheep of the first lot?

Ans. \$100 and \$7. [14.]

EUCLID.

Examiner-J. Dearness.

NOTE.—Symbols, except of operation, may be employed. Use capital letters on the diagrams. It is recommended that every step in the demonstration should begin on a new line.

1. What is a postulate? [3.]

The pertulates permit or ask for the use of the ruler and compass; with what limitations? [3.]

To what class of "Propositions" do the *axioms* and the *postulates* respectively correspond? [3.]

2. "A theorem consists of the hypothesis and predicate, and requires demonstration." Explain this statement by reference to two propositions, one of them being "The greater side of every triangle is opposite to the greater angle." (I. 18.) [8.]

3 Draw a straight line at right angles to a given straight line from a given point in the same. (I. 11.) [10.]

4. In the preceding, given the point at the end of the line, draw a line at right angles without producing the given line. (Apply I. 32.) [10.]