ARTS DEPARTMENT.

EXAMINATION PAPERS AND SOLUTIONS.

[NOTE.—We publish the remaining papers set at the December Examinations for Second-class Teachers and Intermediate, with Solutions to the Arithmetic, Algebra, Euclid and Natural Philosophy papers. A number of selected questions in Algebra, kindly sent us by a correspondent, will be found in the department, the solutions to which will be given next month.—ARCH. MACMURCHY, MATH. EDITOR, C.E.M.]

BOOK-KEEPING.

1. Define Bills Payable, Interest, Draft, Days of Grace.

2. What is a Trial Balance? When the Dr. and Cr. columns are equal are the Ledger accounts necessarily correct? Give reason for your answer.

3. Define Cash Account, Stock Account, Loss and Gain Account.

4. Give John Brown's Journal entries for the following:—May 1st, 1876. John Brown's Ledger shows the following Resources and Liabilities:—Real Estate, $1,000; Mdse. on hand, $600; Bank account shows balance to his credit, $200; He holds a note against James Muir to the amount of $250; John Smith's account shows a balance of $600 in favour of John Smith. His Blotter contains the following entries:—

2nd—Paid, for rent, $120; and sold mdse., for cash, $80. 3rd Sold George Wilson $1,000 worth of mdse., and received in payment cheque on bank $600, cash $100, balance to remain on account. 4th—Bought mdse. from A. B., and gave him cheque on Bank in full for $500. 5th—Paid John Smith cash, on account, $450. 6th—Brown received George Wilson's note at 3 mos. for the balance of Wilson's account, and deposited the note in the Bank. 8th—Drew from the Bank, cash, $800, with which bought mdse., $200, lent A. Jones $100 of it, and with balance bought a note against John Smith, face of note $550.

5. Write out the cheque received from Wilson on the 3rd, and the note given by Wilson on the 6th, making the note negotiable.

6. Post the following accounts in the above (4)—Mdse., Cash, George Wilson.

ALGEBRA.

The following questions in Algebra selected from various sources, will furnish good exercise to candidates for First Class Certificates and University Matriculation Honours. Solutions will be given in a future number.—W. J. ROBERTSON, B.A., *Coll. Inst., St. Catharines.*

1. If $2a=y+z, 2b=z+x, 2c=x+y$, find value of $2a^2b^2+2b^2c^2+2a^2c^2-a^4-b^4-c^4$ in terms of x, y, z, and express $(x+y+z)(xy+yz+zx)-xyz$ in terms of a, b, c.

2. Prove that $(a^2+b^2+c^2)^3+2(bc+ca+ab)^3-3(a^2+b^2+c^2)(ab+bc+ca)^2=(a^3+b^3+c^3-3abc)^2$.

3. If $\frac{1}{b}+\frac{1}{c}=\frac{4}{a}$, shew that $(a+b-c)^3+2(b+c-a)^3+(c+a-b)^3=2(b+c)^3$.

4. Find the numerical value of $\frac{c}{b}\cdot\frac{\sqrt{a}+\sqrt{c}}{\sqrt{a}-\sqrt{c}}$ when $a(b-c)^2-c(b+c)^2=0$.

5. If $x+c$ be the H.C.M. of x^2+ax+b, and $x^2+a_1x+b_1$ shew their L.C.M. will be $x^3+(a+a_1-c)x^2+(aa_1-c^2)x+(a-c)(a_1-c)c$.