

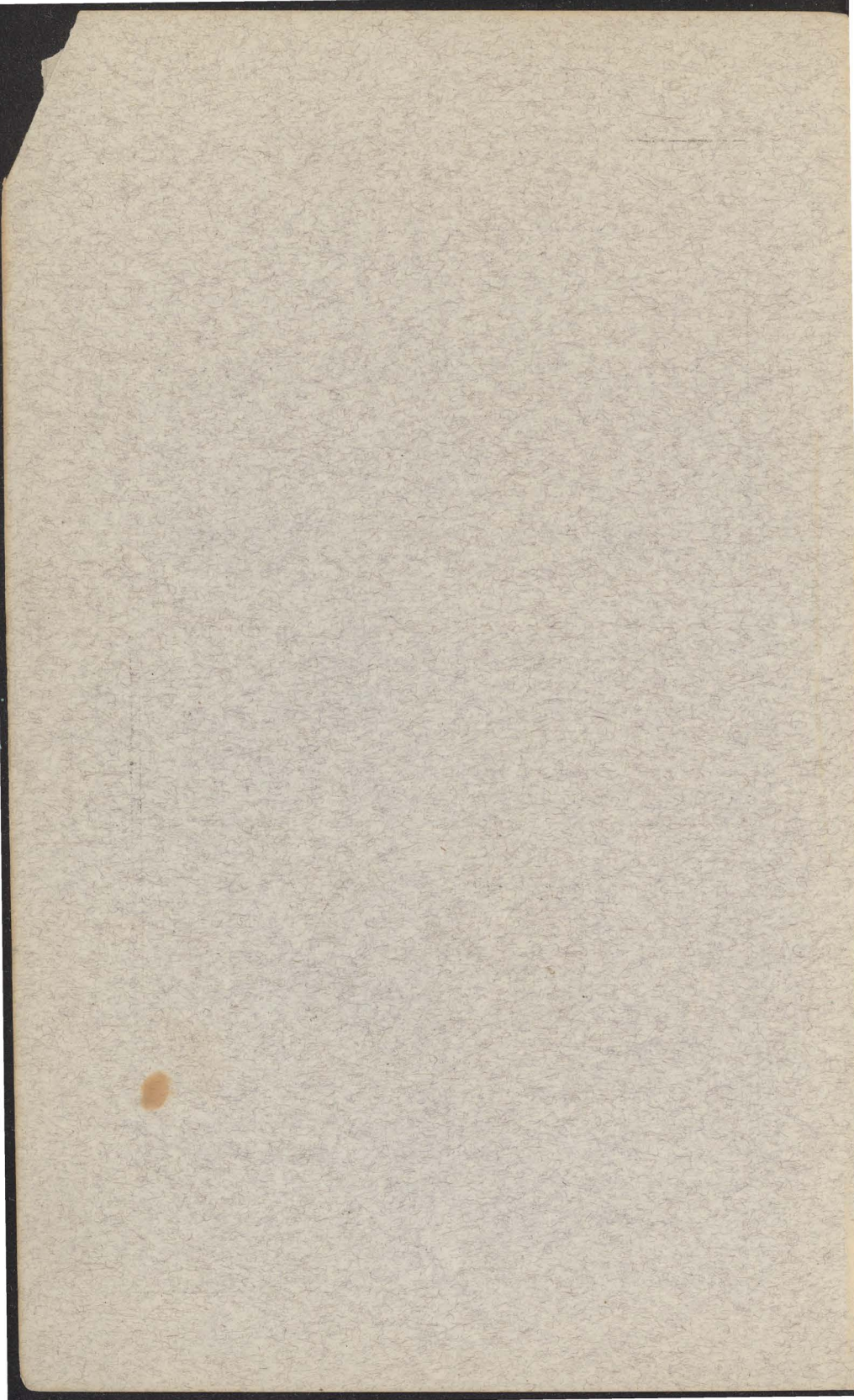
CALENDAR
OF
DALHOUSIE COLLEGE AND
UNIVERSITY,
HALIFAX, NOVA SCOTIA.

FOUNDED - - - 1820.
REORGANIZED - 1863.

1881-82.



HALIFAX:
PRINTED FOR THE UNIVERSITY BY NOVA SCOTIA PRINTING CO.
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1881-82

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HALIFAX
Printed and Published by
J. H. B. [illegible]

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RECENT DONATIONS.

THE MUNRO FUNDS.

Regarding the recent benefactions of GEORGE MUNRO, Esq., of New York, to Dalhousie College, the Governors desire to place on permanent record their high sense of his enlightened public spirit and his unparalleled munificence. Two years ago MR. MUNRO placed in the hands of the Governors the funds necessary for the endowment of a Professorship of Physics, enabling them thus to meet the more clamant needs of the undergraduate curriculum. This year he has reinforced their obligations and their gratitude to him by providing like means for the establishment of a Professorship of History. To connect the donor's name for all time with the benefits conferred by him, the Governors have decided that these chairs shall be known as the George Munro chairs of Physics and History respectively. To Mr. Munro it is owing that Dalhousie College, in the department of Arts and Science, now stands furnished with educational forces of which no college in these Provinces, and few in the Dominion, can offer the equivalent.

MR. MUNRO's liberality has not stopped with these desired additions to the teaching faculties of the College. The Exhibitions and Bursaries which he has offered at the beginning and also at the middle of the Arts course, hold out to capable students pecuniary inducements superior, so far as the Governors are aware, to any not only in this Dominion but in the United States as well, and place Dalhousie College in this respect on a level with the old and richly endowed universities of Europe. By these facilities and inducements, offered to the youth of our country as an incentive and an aid to higher education, and distributed to different localities, so as to stimulate and improve the education of our high schools and academies, MR. MUNRO has not only, in a manner without precedent or parallel, made himself the benefactor of our youth, but placed the public under lasting obligation. The Governors heartily thank him for coming to their help in the work of building up a great unsectarian educational centre in Nova Scotia; for seeking the good of his native land by so generously providing for the quickening of its intellectual life, and for the free, unsolicited and unostentatious manner in which he has made his contribution to what must be regarded by all as an institution essential to the true and permanent welfare of the Maritime Provinces.

ENDOWMENT FUND.

Hon. Sir William Young.....	\$1,000	Hon. Robert Boak	\$1,000
W. J. Stairs.....	1,000	Adam Burns.....	500
Hon. Stayley Brown.....	1,000	Peter Jack.....	500
John Gibson.....	1,000	Hon. Jeremiah Northup.....	500
John P. Mott.....	1,000	George Lawson.....	500
William P. West.....	1,000	Alex. McLeod.....	500
Thos. A. Ritchie	1,000	D. C. Fraser.....	100

SCIENTIFIC APPARATUS FUND.

Hon. Sir William Young.....	\$500	Robert Morrow.....	\$ 50
Alumni Association Dal. College	150	Peter Jack.....	50
W. J. Stairs.....	100	John S. Maclean ..	50
Hon. Jeremiah Northup.....	100	A Friend.....	50
Thos. Bayne.....	100	Thos. A. Brown.....	50
Alex. McLeod	100	Esson & Co.....	50
John McNab	100	James Thomson ..	50
W. P. West	100	John Gibson	50
James F. Avery, M. D.....	100	Prof. Lawson.....	50
Hon. Robert Boak	100	Smaller subscriptions amounting	
Hon. J. W. Ritchie.....	50	to	645
Doull & Miller.....	50		

FIVE YEARS' FUND—1870-75.

Principal Grant, D.D.....	\$200	J. Donaldson.....	\$100
J. Doull.....	200	A. K. Mackinlay	100
W. J. Stairs	200	T. A. Ritchie.....	100
Sandford Fleming.....	200	E. Smith.....	100
Hon. Sir William Young	160	R. H. Skimmings.....	100
Medical Faculty	160	Hon. Judge Ritchie.....	80
R. Boak, Jr.	160	Prof. Macdonald	80
Dr. Avery.....	150	J. W. Carmichael.....	80
A. Burns.....	125	C. D. Hunter.....	80
Sir Charles Tupper.....	100	James Scott	80
Dr. Ross.....	100	Colonel Laurie	80
Dr. Lawson.....	100	J. J. Bremner	80
Prof. Johnson	100	Lawson, Harrington & Co.....	80
Prof. DeMill	100	J. P. Mott	80
Prof. Liechti	100	Hon. S. L. Shannon.....	60
John S. Maclean	100	G. P. Mitchell	60
James Thomson	100	W. H. Neal	50
Robert Morrow.....	100	R. W. Fraser.....	50
J. Stairs	100	J. B. Duffus.....	50
Hon. Jeremiah Northup.....	100	G. Thomson	50
Joseph Northup	100	P. Jack	50
B. H. Collius.....	100	Smaller subscriptions amounting	
Alex. McLeod	100	to	1239

UNIVERSITY CALENDAR, 1881-82.

1881.

WINTER SESSION.

Oct.	3.	Mo.	Meeting of Governors.
	21.	Fr.	Meeting of Senate, 4 P. M.
	24.	Mo.	Winter Session begins.—Examinations for Exhibitions and Bursaries.—10 A. M., Latin; 3 P. M., Geometry.
	25.	Tu.	Examinations for Exhibitions, &c., continued.—10 A. M., Algebra; 3 P. M., Greek, French and German.—Matriculation Examination.—10 A. M., Mathematics; 3 P. M., Classics.—Supplementary Examinations, 10 A. M.
	26.	We.	Examinations for Exhibitions, &c., and for Matriculation.—10 A. M., English.
	28.	Fr.	Meeting of Senate, 10 A. M.—Matriculation, Registration and Issue of Library Tickets, 2 P. M.
	31.	Mo.	Classes opened and Class Tickets issued.—Entrance Examinations in Classical History and Geography, 3 P. M.
Nov.	1.	Tu.	Meeting of Convocation, 3 P. M.—Opening address by Prof. Forrest.
	9.	We.	Final Matriculation and Supplementary Examinations, 3 P. M.
	10.	Th.	Meeting of Senate and Faculty of Science, 4 P. M.
Dec.	20.	Tu.	Meeting of Senate, 4 P. M.
	23.	Fr.	No lectures.—Christmas Vacation begins.

1882.

Jan.	3.	Tu.	Meeting of Governors.
	5.	Th.	Class lectures resumed.—Supplementary Examinations in Classical History and Geography, 3.30 P. M.
	10.	Tu.	Meeting of Senate and Faculty of Science, 4 P. M.
Feb.	7.	Tu.	Meeting of Senate, 4 P. M.
	22.	We.	Ash Wednesday.—No lectures.
March	1.	We.	Last day for receiving M. A. Theses.
	21.	Tu.	Meeting of Senate, 4 P. M.
April	3.	Mo.	Meeting of Governors.
	6.	Th.	Last day of lectures.—Meeting of Senate, 4 P. M.
	7.	Fr.	Good Friday.
	12.	We.	Sessional Examinations begin.—10 A. M., Latin; 3 P. M., Extra Latin and Honour Classics.
	13.	Th.	10 A. M., Logic, Metaphysics, Honour Mathematics and Ethics.
	14.	Fr.	10 A. M., Greek; 3 P. M., Extra Greek and Honour Classics.
	17.	Mo.	10 A. M., Geology, Botany, Zoology, Honour Physics and Honour Classics.
	18.	Tu.	10 A. M., Mathematics, Mathematical Physics and Honour Classics; 3 P. M., Mathematics, Experimental Physics and Honour Classics.
	19.	We.	10 A. M., Rhetoric and History; 3 P. M., Honour Classics and Honour Mathematics.
	20.	Th.	10 A. M., French and German; 3 P. M., French, German, Hebrew, and Extra Mathematics.
	21.	Fr.	10 A. M., Chemistry, Honour Classics and Honour Mathematics.—Last day for returning books to the Library.
	22.	Sa.	10 A. M., Practical Chemistry.
	24.	Mo.	Meeting of Senate, 10 A. M.
	25.	Tu.	Meeting of Senate, 10 A. M.—Results of Examinations declared.
	26.	We.	Meeting of Convocation, 3 P. M.—Meeting of Alumni Association, 10 A. M.—Dinner of Alumni Association, 3 P. M.

SUMMER SESSION.

May	1.	Mo.	Summer Session begins.—Registration of students, 10 A. M.—Meeting of Senate, 11 A. M.—Class Tickets issued, 12 M.
	24.	We.	Queen's Birthday.—No lectures.
June	21.	We.	Halifax settled, 1749.—No lectures.
	28.	We.	Sessional Examinations.
	29.	Th.	Do. Do.
	30.	Fr.	Results declared.—Session closes.
July	3.	Me.	Meeting of Governors.

Dalhousie College & University.

BOARD OF GOVERNORS.

- HON. SIR WILLIAM YOUNG, LL. D., Kt, late Chief Justice, *Chairman*.
HON. SIR CHARLES TUPPER, K. C. M. G., C. B., M. D., M. P.
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JOHN S. MACLEAN, Esq.
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JOHN DOULL, Esq.
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-

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CHARLES MACDONALD, M. A., *Corresponding Secretary*.
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REV. JOHN FORREST, *George Munro Professor of History.*

PROFESSOR LIECHTI, M. A., *Tutor in Modern Languages.*

FACULTY OF SCIENCE.

THE PROFESSORS OF THE FACULTY OF ARTS, with

JAMES LIECHTI, M. A. (Vind.), *Professor of Modern Languages.*

REV. DAVID HONEYMAN, D. C. L., F. S. A., *Professor of Geology and Palaeontology.*

Librarian:

PROFESSOR FORREST.

Janitor:

JOHN WILSON,

REGULATIONS.

§ I.—SESSIONS.

In the Academic year there are two Sessions, a Winter and a Summer Session.

The Winter Session of 1881-2 will commence on Monday, October 24th, 1881, and end on Wednesday, April 26th, 1882.

The Summer Session of 1882 will commence on Monday, May 1st, and end on June 30th.

§ II.—ADMISSION OF STUDENTS.

Students may enter the College, as Undergraduates, with the intention of applying for a University Degree in Arts or Science at the end of their course; or, as General Students who do not look forward to a University Degree.

The ordinary course for Undergraduates in either Arts or Science extends either over four Winter Sessions, or over three Winter Sessions with the two intervening Summer Sessions. The latter alternative is, however, contingent on arrangements to be made by the Governors. Undergraduates taking either of these courses are required to pass the Matriculation Examination for the First Year, in Arts or Science, as the case may be, (see § III,) and to take the classes prescribed for their respective courses.

Students may also complete their course in three Winter Sessions without the intervening Summer Sessions, by passing the Matriculation Examination for the Second Year in Arts or Science, as the case may be, (see § III.), and taking the usual undergraduate course for the Second, Third and Fourth Years.

The Matriculation Examinations this year will begin on October 25th, at 10 o'clock, A. M. Candidates are expected to bring their own writing materials, except paper.

General Students are not required to pass a Matriculation Examination, and may attend such classes as they choose.

No person can be admitted as an Undergraduate after ten days from the opening of the classes, without the special permission of the Senate.

Undergraduates from other Universities will, on producing satisfactory certificates, be admitted to similar standing in this University, if, on examination, they be found qualified to enter the classes proper to their year. But if their previous courses have not corresponded to the courses on which they enter in this College, they may be required by the Senate to take extra classes.

Students who have passed the Matriculation Examination at the University of Halifax, are admitted as Undergraduates without further examination, and Students who have passed the first B. A. Examination of that University, will be admitted to the standing of Undergraduates in Arts who have completed two Winter Sessions.

§ III.—MATRICULATION EXAMINATIONS.

(A) IN ARTS.

FOR THE FIRST YEAR.

The Examinations are partly oral and partly written. The subjects for entrance into the First Year of the course are :

I. IN CLASSICS.—Latin Grammar, Greek Grammar, one Latin subject, one Greek subject. The following subjects are recommended :

In Latin.—For 1881 : *Cæsar*, Gallic War, Book VI. ; or *Virgil*, *Æneid*, Book VI.

For 1882 : *Cæsar*, Gallic War, Book VI. ; or *Ovid*, *Metamorphoses*, Book I.

In Greek.—For 1881 : *Xenophon*, *Anabasis*, Book IV.

For 1882 : *Xenophon*, *Anabasis*, Book III.

Instead of the above, equivalents may be offered, if they be not parts of the Undergraduate course, on giving a week's notice to the Secretary of the Senate.

II. IN MATHEMATICS.—Arithmetic ; Euclid's Elements of Geometry, Books I. and II. ; Algebra—Simple Rules, and Simple Equations of one unknown quantity, not involving Surds.

III. IN ENGLISH.—Grammar ; History of England ; Geography ; Composition.

Competitors for Munro Exhibitions and Bursaries, whose examinations are approved by the Senate, shall be exempt from further examination for Matriculation.

FOR THE SECOND YEAR.

- I. IN CLASSICS.—The subjects of the Matriculation Examination for the First Year and the subjects of the First Year's course as specified in § XIV., or their equivalents.
- II. IN MATHEMATICS.—The subjects of the First Year's course as specified in § XIV.
- III. IN ENGLISH.—The subjects of the Matriculation Examination for the First Year.
- IV. IN ROMAN HISTORY AND ANCIENT GEOGRAPHY.—As specified in §§ IV. and XIV.

(B) IN SCIENCE.

FOR THE FIRST YEAR.

- I. IN MATHEMATICS.—The subjects of the Matriculation Examination for the First Year in Arts.
- II. IN ENGLISH.—The subjects of the Matriculation Examination for the First Year in Arts.
- III. IN LATIN OR GERMAN OR FRENCH :—
 - Latin*.—The subjects of the Matriculation Examination for the First Year in Arts.
 - German*.—Adler's Reader, Part I., Nos. 1-15.
 - French*.—Voltaire's *Charles XII.*, Book I.

Grammatical questions in the modern languages based upon the passages selected.

FOR THE SECOND YEAR.

- I. IN MATHEMATICS.—The subjects of the First Year's course as specified in § XIV.
- II. IN ENGLISH.—The subjects of the Matriculation Examination for the First Year.
- III. IN LATIN OR GERMAN :—
 - Latin*.—The subjects required for Matriculation in the Second Year of the Arts Course.
 - German*.—Adler's Reader, Part II., first fifteen pieces. First twenty lessons in Otto's German Grammar.
- IV. IN INORGANIC CHEMISTRY.—The subjects of the First Year's course.

§ IV.—COURSES FOR DEGREE OF B. A

COURSE OF FOUR WINTER SESSIONS.

First Year.—(1) Latin. (2) Greek. (3) Mathematics. (4) English Language and Rhetoric.

Second Year.—(1) Latin. (2) Greek. (3) Mathematics. (4) Inorganic Chemistry. (5) Logic and Psychology.

Undergraduates of the Second Year are required to pass an Examination in Roman History and Ancient Geography, on the second Monday of the Winter Session. (See § XIV.)

Third Year.—(1) Latin. (2) Mathematical Physics. (3) Experimental Physics. (4) Metaphysics. (5) and (6) Any two of the following: French, German, Greek.

Undergraduates of the Third Year are required to pass an Examination in Grecian History and Ancient Geography on the second Monday of the Winter Session. (See § XIV.)

Fourth Year.—(1) Latin. (2) Ethics and Political Economy. (3) History. (4) and (5) Any two of the following: French, German, Greek, Astronomy, Hebrew.

An undergraduate who takes a modern language in the Third Year must take the same language in the Fourth Year.

COURSE OF THREE WINTER SESSIONS AND TWO SUMMER SESSIONS.

First Winter.—(1) Latin. (2) Greek. (3) Mathematics. (4) English Language and Rhetoric.

First Summer.—(1) Latin and Greek, or Mathematics.* (2) French or German † (3) English Literature.

Second Winter.—(1) Latin. (2) Greek. (3) Mathematics. (4) Inorganic Chemistry. (5) Logic and Psychology.

Second Summer.—(1) Astronomy, or Latin and Greek.* (2) French or German. † (3) Ethics and Political Economy.

Third Winter.—(1) Latin. (2) Metaphysics. (3) Mathematical Physics. (4) Experimental Physics. (5) and (6) Any two of the following: French, German, Greek.

* The Student must take that subject of these two on which lectures are being given.

† The Student may take whichever modern language he pleases, but he must take the same language during both Summers.

§ V.—COURSES FOR DEGREE OF B. Sc.

COURSE OF FOUR WINTER SESSIONS.

First Year.—(1) Mathematics. (2) Inorganic Chemistry. (3) Rhetoric. (4) Latin or German.

If German be taken the First Year it must be taken throughout the course; but Latin may be taken the first two years, and German the last two.

Second Year.—(1) Mathematics. (2) Botany. (3) Organic Chemistry. (4) Latin or German. (5) French. (6) Either (A) Extra Mathematics and Chemical Laboratory or (B) Chemical Laboratory (more extended course).

Whichever group, (A) or (B), is taken in the Second Year must be taken in subsequent years.

Third Year.—(1) Logic. (2) Latin or German. (3) French. (4) Geology. (5) Mathematical Physics. (6) Either (A) Mathematics or (B) Chemical Laboratory.

Fourth Year.—(1) Latin or German. (2) French. (3) Experimental Physics. (4) Geology. (5) Either (A) Mathematics and Astronomy or (B) Organic Chemistry and Chemical Laboratory.

COURSE OF THREE WINTER SESSIONS AND TWO SUMMER SESSIONS.

First Winter.—(1) Mathematics. (2) Inorganic Chemistry. (3) Rhetoric. (4) Latin or German.

If German be taken the first winter session it must be taken throughout the course; if Latin, German may be substituted for it the third winter session.

First Summer.—(1) Mathematics or Logic.* (2) Botany. (3) German. (4) Histological Laboratory.

Second Winter.—(1) Mathematics. (2) Zoology. (3) Organic Chemistry. (4) Latin or German. (5) French. (6) Either (A) Extra Mathematics and Chemical Laboratory or (B) Chemical Laboratory (extended) or (C) Geology and Chemical Laboratory.

Second Summer.—(1) Logic or Ethics and Political Economy.* (2) German. (3) French. (4) Either (A) Astronomy or (B) Chemical Laboratory and Biology, (Field and Laboratory work) or (C) Geology and Biology, (Field, Museum and Laboratory work).

* The Student must take that subject on which lectures are being given.

Third Winter.—(1) Latin or German. (2) French. (3) Mathematical Physics. (4) Experimental Physics. (5) Either (A) Mathematics and Additional Mathematical Physics or (B) Organic Chemistry and Chemical Laboratory or (C) Geology and Biological Laboratory.

Whichever group, (A) or (B) or (C), is taken in the second winter session must be taken in subsequent sessions.

§ VI.—HONOUR COURSES.

Honour Courses are intended for Undergraduates whose tastes and ability lead them to prosecute special subjects of the Curriculum, and remissions of classes are granted to those studying such courses.

Honour Courses are provided in the following* departments: (1) Classics; (2) Mathematics and Physics; (3) Mental and Moral Philosophy, and Political Economy; (4) Experimental Physics and Chemistry; (5) Botany and Geology. Instruction of an advanced kind is provided in the first two of these departments during the third and fourth winters of the Curriculum. In the fifth department summer work will be prescribed.

Examinations in these courses are held at the final examinations for Degrees; and a Student passing First or Second Class in any of the above departments obtains the Degree of Bachelor, with First or Second Rank Honours in such department. But First Rank Honours shall not be awarded to any one who has not passed First Class in the corresponding subjects of the Ordinary Course of the Fourth Year; nor second Rank Honours to one who has not passed Second Class in the Ordinary Course.

Students studying for Honours must attend the Honour Lectures of their respective courses, and their progress must be satisfactory to their Professors. Students who intend to take the Honour Course in *Mental and Moral Philosophy* and *Political Economy* must give notice of their intention to the Secretary of Senate before the close of the lectures of their Third Year.

No Student will be allowed to enter on an Honour Course who has not stood in the First or Second Class at the previous examination in the corresponding part of the Ordinary Course.

A Student taking an Honour Course, but failing to obtain Honours, will receive the Ordinary Degree, if his examination in the course be approved.

An Undergraduate in Arts, studying for Honours in Classics may in the Third Year omit any two and in the Fourth Year any one of the ordinary subjects of the year, provided they are not in immediate connection with his Honour Course.

* For details of subjects see § XV.

An Undergraduate in Arts, studying for Honours in Mathematics and Physics may in the Third and Fourth Years omit any two of the subjects of those years, provided they are not in immediate connection with his Honour Course.

An Undergraduate in Arts, studying for Honours in Mental and Moral Philosophy and Political Economy may in the Fourth Year omit any one of the subjects of the year except Ethics.

An Undergraduate in Science, studying for Honours in Mathematics and Physics, or in Experimental Physics and Chemistry, may in the Third and Fourth Years omit any one of the subjects of these years, provided they are not in immediate connection with his Honour Course.

A candidate for Honours may defer his Honours Examination until a year after he has passed the Ordinary Examinations in the necessary subjects of the Fourth Year. But he shall not be entitled to the Degree of Bachelor until he has passed the Honours Examination.

§ VII.—FEES.

The class fee to each Professor or Lecturer is *six dollars* for the Winter Session, and *three dollars* for the Summer Session.

An Undergraduate in Arts pays only one fee during the Winter Sessions of his course to the Professors of Logic and of Physics, and to the Tutor in Modern Languages.

An Undergraduate who has completed two years of his course may attend the Classics and Mathematics during the remaining Winter Sessions of his Undergraduate course without the payment of additional fees.

An Undergraduate in Science pays during the Winter Sessions of his course only one class fee to the Professor of Physics, and only two class fees to the Professors of Chemistry, Biological Science, and Modern Languages.

A fee of *six dollars* is charged for every three months of practical work in the Chemical Laboratory. Students taking this class are required to provide their own materials, which, if they wish, will be supplied to them at first cost. The use of the larger articles of apparatus will be given in the Laboratory free of expense, and Students will be charged with breakage.

General Students pay a fee for every class they attend, and Undergraduates taking classes in addition to the prescribed Curriculum pay additional fees.

In addition to the Class Fee, there is a Matriculation Fee of *two dollars*, payable by Undergraduates at their first entrance. General Students pay a Sessional Registration Fee of *one dollar*.

Both Undergraduates and General Students are also required, at the beginning of each Winter Session, to pay a Library Fee

of *one dollar*, which entitles to the use of the Library for the Session.

Matriculation or Registration Tickets, and Class Tickets, must be taken out before attending Lectures, no Students being allowed to enter a class without them.

The total fees of Undergraduates, who take the course of four Winter Sessions in Arts, are as follows:—

Classes of First Winter, with Library and Matriculation Fees.....	\$21.00
“ Second “ “ “ Fee	25.00
“ Third “ “ “ “	13.00
“ Fourth “ “ “ “	13.00

The total fees of Undergraduates in Arts, who take the course of three Winter Sessions, and the intervening Summer Sessions, are as follows:—

Classes of First Winter, with Library and Matriculation Fees.....	\$21.00
“ “ Summer, “ “ Fee.....	10.00
“ Second Winter, “ “	25.00
“ “ Summer, “ “	10.00
“ Third Winter, “ “	13.00

The total fees of Undergraduates in Science, who take the course of four Winter Sessions, are as follows:—

Classes of First Winter, with Matriculation and Library Fees.....	\$27.00
“ Second Winter, with Library Fee, according to selection of classes	\$31.00 or 25.00
“ Third Winter, with Library Fee, according to selection of classes	\$19.00 or 25.00
“ Fourth Winter, with Library Fee, according to selection of classes	\$13.00 or 7.00

The total fees of Undergraduates in Science, who take the course of three Winter and two Summer Sessions, are as follows:—

Classes of First Winter, with Library and Matriculation Fees.....	\$27.00
“ “ Summer, “ “ Fee.....	13.00
“ Second Winter, “ “	\$37.00, \$31.00 or 25.00
“ “ Summer, “ “	13.00 or 10.00
“ Third Winter, “ “	\$7.00, 13.00 or 19.00

§ VIII.—GRADUATION.

DEGREES OF B.A. AND B.SC.

The Degrees of Bachelor of Arts and Bachelor of Science may be obtained by passing the proper Matriculation Examination, attending the prescribed courses of Lectures, and passing the Sessional Examinations of the several years. Undergraduates in Arts have also to pass the Entrance Examinations of the Second and Third Years, as mentioned in § IV.

The fee for the Diploma, payable before the Final Sessional Examination, is *five dollars*. The fee is returned in case of failure at the examination.

DEGREE OF M.A.

A Bachelor of Arts, of at least three years' standing, maintaining meanwhile a good reputation, shall be entitled to the Degree of Master of Arts, on producing an approved Thesis on some literary, philosophical or scientific subject.

Fee for Diploma, which must accompany the Thesis, *twenty dollars*. Thesis to be handed in on or before the 1st March.

§ IX.—REGULATIONS FOR EXAMINATIONS.

1. If any Undergraduate absent himself from any University Examination, except from such cause as may be held good by the Senate, he shall lose his Session.

2. If any Undergraduate fail to pass in any subject at the Sessional Examinations, he will be allowed a Supplementary Examination on the first Tuesday of the following Winter Session, or of a subsequent Winter Session, on giving notice to the Secretary of the Senate at least one week before the opening of such Session; but failure in more than two subjects at the Sessional Examinations will involve the loss of the Session.

3. In the case of a Student having to take a Session over again, the Senate may remit attendance on classes the examinations of which he has already passed with credit.

4. An Undergraduate who, at the end of the first year of the Four Years course, fails in more than two subjects, shall not be disqualified by Rule 2 from presenting himself for matriculation into the Three Winters course, provided he give a week's notice to the Secretary of the Senate before the opening of the Winter Session.

5. In all cases, a Student who presents himself for Supplementary Examination on any day except that specified in Rule 2, will be required to pay an extra fee of *two dollars*.

6. Undergraduates in Arts of the Second and Third Years who fail to present themselves for the Entrance Examinations in Ancient History and Geography on the second Monday of the Winter Session may, on payment of a fine of *two dollars*, and on giving notice to the Secretary of the Senate at or immediately after the opening of the Winter Session, have another day appointed them for such examinations.

7. Students are forbidden to bring any book or manuscript into the Examination Hall, unless by direction of the Examiner, or to give or receive assistance, or to hold any communication with one another at the examinations. If a Student violate this rule he shall lose his Sessional Examinations for the year;

and it shall be at the discretion of the Senate whether he be allowed Supplementary Examinations.

8. Students who pass the examinations in the several subjects of the respective years are arranged in three classes, First Class, Second Class and Passed, according to the merit of their answers in these subjects.

§ X.—ATTENDANCE AND CONDUCT.

1. All Undergraduates and General Students attending more classes than one are required to provide themselves with caps and gowns, and to appear in academic costume at Lectures, and at all meetings of the University.

2. Attendance upon all classes of the year, except those announced as optional, shall be imperative on all Undergraduates.

3. Professors will mark the presence or absence of Students immediately before commencing the work of the class, and will note as absent those who enter thereafter, unless satisfactory reasons be assigned.

4. Absence without sufficient excuse, or lateness, or inattention, or disorder in the class room, if persisted in after due admonition by the Professor, will be reported to the Senate.

5. The amount of absence which shall disqualify for the keeping of a Session will be determined by the Senate.

6. Injuries to the building or furniture will be repaired at the expense of the person or persons by whom they have been caused, and such other penalty will be imposed as the Senate may think proper.

7. Any improper conduct on the part of a Student, whether in the College or elsewhere, may subject him to the censure of the Senate; and the Senate may fine, reprimand (either privately or in the presence of the Students), report to the parents or guardians, disqualify for competing for Prizes or for holding Certificates of Merit, or report to the Governors for suspension or expulsion.

8. Students not residing with parents or guardians must report to the Principal their places of residence within one week after their entering College, and the Principal may disallow such residence if he see good cause. Any change of residence must also be reported.

9. It is expected that every Student will attend Divine Worship regularly, in one of the city churches or chapels.

§ XI.—MUNRO EXHIBITIONS AND BURSARIES.

IN THE FACULTY OF ARTS.

The following Exhibitions and Bursaries are offered by George Munro, Esq., of New York, for competition at the commencement of the Winter Sessions of 1881-2, 1882-3, 1883-4 :

In October, 1881, { I. FIVE JUNIOR EXHIBITIONS.
II. THIRTEEN JUNIOR BURSARIES.

In October, 1882, SEVEN SENIOR BURSARIES.

In October, 1883, { I. FIVE SENIOR EXHIBITIONS.
II. TEN SENIOR BURSARIES.

The Exhibitions, and the Seven Senior Bursaries (1882) are each of the value of \$200 per annum ; the other Bursaries are each of the value of \$150 per annum. Both Exhibitions and Bursaries are tenable for two years.

CONDITIONS OF COMPETITION.

1. *The Junior Exhibitions and Bursaries* are offered for competition (as limited by sections 4 and 6) to candidates for matriculation in Arts, provided they have previously neither matriculated* at any University conferring Degrees in Arts, nor appeared as candidates for these Exhibitions and Bursaries more than once.

2. *The Senior Exhibitions and Bursaries* are offered for competition to Undergraduates entering the Third Year of the Undergraduate course in Arts. Candidates must have completed two and only two years of their course in Arts either at this or at some other University,† and have matriculated within three academic years of the date of competition. Candidates from other Universities must comply with the conditions of § II.

3. *The Exhibitions* are open to all candidates satisfying the conditions of sections 1 and 2.

4. *The Bursaries* (the seven Senior Bursaries of 1882 excepted) are limited to candidates from the undermentioned districts, according to the following scheme :—

Four Bursaries to District No. 1, comprising the Counties of Halifax, Colchester, Pictou and Yarmouth.

Three Bursaries to District No. 2, comprising the remaining Counties of Nova Scotia proper.

* An exception will be made in 1881 in the case of candidates who in 1880 matriculated in the University of Halifax, or in the Science course of this University.

† Undergraduates of the University of Halifax, who have passed the First B. A. Examination, shall be regarded as having completed two years of their Arts course.

Two Bursaries to District No. 3, viz.: the Island of Cape Breton.

Two Bursaries to District No. 4, viz.: Prince Edward Island.

Two Bursaries to District No. 5, viz.: New Brunswick.

5. The district under which a candidate competes shall be determined either by the locality of the last school or academy* which he has attended for one school or academic year within the two calendar years immediately preceding (for Junior Exhibitions and Bursaries) the date of the competition, (for Senior Exhibitions and Bursaries) the date of his matriculation; or in the event of his not having attended for a school or academic year any school or academy within these two years, by his permanent or usual residence previously to matriculation.

6. *The Seven Senior Bursaries* of 1882 are limited to candidates from the following districts, to each of which one Bursary is allotted.

No. 1.—The Island of Cape Breton.

No. 2.—The Counties of Pictou, Antigonish and Guysboro'.

No. 3.—The Counties of Colchester, Cumberland and Hants.

No. 4.—The Counties of Halifax, Lunenburg and Kings.

No. 5.—The Counties of Annapolis, Digby, Yarmouth, Shelburne and Queens.

No. 6.—New Brunswick.

No. 7.—Prince Edward Island.

CONDITIONS OF TENURE.

7. *The Junior Exhibitions and Bursaries* shall be held during two years, provided the holder (*a*) attend in consecutive years the classes proper to the first and second years of the Four Years Arts Course to the satisfaction of the Senate, (*b*) shew special proficiency in at least two† of the subjects of examination at the end of the first year, besides passing in the others, and (*c*) pass either the Sessional or the Supplementary Examinations of the second year.

8. *The Senior Exhibitions and Bursaries* shall be held during the third and fourth years of the Arts course on conditions similar to those for Junior Exhibitions and Bursaries. But in the case of an Undergraduate studying for Honours in any department, the favourable report of the Professor or Professors in that department on his Honours work in the Third Year shall be considered equivalent to special proficiency in one of the two subjects mentioned in section 7.

* A College not having University powers shall, for the purposes of this rule, be considered a school or academy.

† For the purposes of this condition Mathematics shall be reckoned as two subjects.

GENERAL REGULATIONS.

9. The annual amounts of the above Exhibitions and Bursaries will be paid in three instalments, the first on the first Monday after the opening of the classes, the second on the first Monday after the Christmas vacation, and the third on the day of the Spring Convocation, the payment of each instalment being dependent upon the fulfilment of the conditions of tenure at the date at which it becomes due.

10. Candidates are required to make application for the above Exhibitions and Bursaries by means of a printed form, to be obtained from the Principal, which must be filled up and returned to him with the necessary certificates, at least one fortnight before the date of the competition.

11. A certain standard of answering at the Examinations, fixed by the Senate, will be required for obtaining any of the above Exhibitions or Bursaries. A higher standard will be required for Exhibitions than for Bursaries.

12. The Senate shall have in all cases the right of deciding as to the fulfilment of the above rules and conditions.

13. The Examinations for the Exhibitions and Bursaries which are offered for 1881 will begin on October 24th.

SUBJECTS OF EXAMINATION.

14. The subjects of examination for the *Junior Exhibitions and Bursaries* in 1881 shall be as follows:—

IN LATIN.—*Cæsar*, Gallic War, Book VI.; *Virgil*, *Æneid*, Book VI. Grammar: Accidence, Syntax, Prosody, Scansion of Hexameter Verse. *Text Book*: Smith's Smaller Latin Grammar or Bryce's.

Composition: Easy sentences to be translated into Latin. *Text Book*: Smith's *Principia Latina*, Part IV. Exs. 1-35.

IN GREEK.—*Xenophon*, *Anabasis*, Book IV. Grammar: Accidence (omitting accentuation), chief rules of Syntax. *Text Book*: Hadley's *Elements of Greek Grammar*.

IN MATHEMATICS.—Arithmetic: the ordinary rules of arithmetic, Vulgar and Decimal Fractions, Proportion and Interest. Algebra: as far as Simple Equations and Surds. Geometry: First and Second Books of Euclid or the subjects thereof.

IN ENGLISH.—Grammar, Analysis, Outlines of English and Canadian History and general Geography.

The relative values of these subjects shall be as follows: Classics, 200; Mathematics, 200; English, 100.

15. The subjects of examination for the *Seven Senior Bursaries* in 1882 shall be as follows:—

CLASSICS :

LATIN : *Horace*, Odes, Books III, IV ; *Livy*, Book XXI.
Composition : An easy English passage on some classical subject to be turned into Latin prose. *Text Book* : Smith's *Principia Latina*, Parts IV. and V.

GREEK : *Xenophon*, *Hellenics*, Book I ; *Demosthenes*, the *Olynthiacs*. Composition : *Text Book*—Smith's *Initia Græca*, Part III.

CLASSICAL HISTORY AND GEOGRAPHY : History of Greece to death of Alexander ; Geography of Græcia, Asia. *Text Books*—Smith's *Students' Greece* ; Tozer's *Primer of Classical Geography*.

MATHEMATICS* :

ALGEBRA : Algebraic Proportion and Variation. Permutations and Combinations. Compound Interest and Annuities. Simple and Quadratic Equations. The properties and use of Logarithms.

GEOMETRY : The relations of Similar Figures. The Eleventh Book of Euclid to Prop. 21, or the subjects thereof. The Mensuration of the Simpler Plane and Solid Figures, including the Cylinder and the Cone.

PLANE TRIGONOMETRY : The solution of the various cases of Plane Triangles. The general values of the Trigonometrical Functions of angles. The Functions of the sum and of the difference of two or more angles, and of multiple angles. The relations of the angles, area, inscribed and circumscribed circles of a triangle to the sides of the triangle.

LOGIC OR ENGLISH LITERATURE :

LOGIC : Sir Wm. Hamilton's *Lectures on Logic*. Ennoematic : the Doctrine of Concepts. Apophantic : the Doctrine of Judgments. The Doctrine of Reasonings. Syllogisms : their Divisions according to internal form, their Divisions according to external form. Reasoning in Comprehension, and Reasoning in Extension. Fallacies.

ENGLISH LITERATURE : Spenser's "*Faerie Queene*," 1st Book : Six Cantos. Shakespeare : "*As you like it*," "*Richard II*," "*King Lear*." The Augustan Age and its writers.

* These are, with some alterations, the mathematical subjects of the First B. A. Examination at the London University.

INORGANIC CHEMISTRY OR BOTANY :

INORGANIC CHEMISTRY: Affinity. Definite Proportions by weight. Equivalents. Volumetric Proportions. Atomic Theory. Non-metallic Elements (except F, Se and B), their distribution in nature, preparation, properties, their oxides, acids or other compounds of theoretical importance. The Metals, general chemical character and classification. Constitution of Salts. Details relating to the following Metals so far as regards their mode of occurrence in nature, their oxides and most important salts, and common processes and manufactures, illustrating their chemical characters:—K, Na, Ba, Ca, Mg, Al, Fe, Zn, Mn, Cr, Bi, Sn, Pb, Cu, Hg, Ag, Au, Pt. Reactions are required to be given in form of chemical equations.

BOTANY: The Cell, its structure, contents and development. Tissues. External conformation of Plants. The Axis. Leaves, structure, functions, principal forms and modifications in form in the principal families of plants. Reproductive process in flowering plants. The Fruit, morphology, principal modifications. The Seed, embryo. Reproduction of Ferns, Mosses, Algæ, Fungi. General principles of the Natural System of Classification, with examples of the principal divisions. Details of structure, relations, and geographical distribution in North America of the following orders:—Ranunculaceæ, Nymphaeaceæ, Cruciferae, Violaceæ, Vitaceæ, Leguminosæ, Rosaceæ, Onagraceæ, Cucurbitaceæ, Cactaceæ, Grossulariaceæ, Umbelliferae, Cinchonaceæ, Compositæ, Ericaceæ, Convolvulaceæ, Boraginaceæ, Solanaceæ, Chenopodiaceæ, Polygonaceæ, Urticaceæ, Betulaceæ, Coniferae, Orchidaceæ, Liliaceæ, Cyperaceæ, Gramineæ, Polypodiaceæ.

The relative values of the above subjects shall be as follows:—Classics, 200; Mathematics, 200; Logic or English Literature, 150; Chemistry or Botany, 150.

§ XII.—MEDALS, PRIZES AND CERTIFICATES OF MERIT.

MEDALS.

THE GOVERNOR-GENERAL'S GOLD MEDAL.

This medal shall be awarded to the Undergraduate standing highest among those taking Honours in the department of Classics, the winner of the Sir William Young medal being excluded.

THE SIR WILLIAM YOUNG GOLD MEDAL.

This medal shall be awarded to the Undergraduate standing highest among those taking Honours in the department of Mathematics and Physics, the winner of the Governor-General's Gold Medal being excluded.

THE GOVERNOR-GENERAL'S SILVER MEDAL.

This medal shall be awarded to the Undergraduate standing highest among those taking Honours in one of the following departments, viz : (1) Experimental Physics and Chemistry, and (2), Botany and Geology, in this order of preference, the winner of a gold medal being excluded.

PRIZES.

(The Senate reserves to itself the right of withholding Prizes and Bursaries, unless sufficient merit be shewn.)

THE UNIVERSITY PRIZES.

These Prizes will be awarded to those Students who stand first in the several subjects at the Sessional Examinations.

No Student will be allowed to hold a Prize more than once in the same class.

THE ST. ANDREW'S PRIZE.

This Prize will be awarded this year to the Undergraduate who shall stand first in Mathematics at the Sessional Examinations of the Second Year, the winner of the North British Bursary being excluded.

NORTH BRITISH SOCIETY BURSARY.

A Bursary, of the annual value of \$60, has been founded in connection with Dalhousie College by the North British Society of Halifax, to be competed for at the Sessional Examinations of the Second Year's Course in Arts, and held by the successful competitor for two years, namely, during the Third and Fourth Years of the Undergraduate Course in Arts. Candidates must be Undergraduates who have completed two years of the Curriculum, and must be eligible, at the proper age, to be Members of the North British Society. The next competition will take place in April, 1882, at the Sessional Examinations. In awarding this Bursary, Classics, Mathematics, and Chemistry will be reckoned each 150 ; Logic, 100.

THE WAVERLEY PRIZE.

This Prize of sixty dollars (which comes in place of the Waverley Bursary) will be awarded to the Student of the Second Mathematical Class who stands highest at the Sessional

Examinations in the Mathematics of the year. The first annual competition will take place at the Sessional Examinations in April, 1883.

THE DR. AVERY PRIZE.

A Prize of the value of \$25 is offered by Dr. Avery for competition to the Undergraduates of the Fourth Year, who are not studying for Honours. It will be awarded to the Student who stands highest at the Sessional Examinations.

CERTIFICATES OF MERIT.

Certificates of Merit of the First or Second Rank will be given to Students who have respectively obtained a First or Second Class standing in the aggregate of the branches of study proper to any one year.

§ XIII.—THE LIBRARY.

The Library consists of a careful selection of the most useful books in each department of study embraced in the University Course. There are likewise a few works in general literature. The Library embraces in all upwards of 2000 volumes. All Students are entitled to the use of the Books, on payment of the sessional fee of *one dollar*. A deposit of *two dollars* must be made by a Student with the Librarian before any book can be taken from the Library. This deposit will be repaid to him at any time, if he have returned all the books which may have been entrusted to him.

§ XIV.—ORDINARY COURSES OF LECTURES.

CLASSICS.

LATIN.

FIRST YEAR'S CLASS.

Cicero: De Imperio Cn. Pompeii; * Fourth Oration against Catiline; *Virgil*: The Eclogues.

Composition: Smith's Principia Latina, Part IV., (Second half).

SECOND YEAR'S CLASS.

Livy: Book I.; *Horace*, Odes, Book I.; * Book III.

Composition: Smith's Principia Latina, Parts IV., V.

† THIRD AND FOURTH YEAR'S CLASS.

Tacitus: Agricola; *Terence*: Adelphi; *Juvenal*: Sat. III., X., XIII.
Composition: Principia Latina, Part V.

Comparative Philology: Text Books, Müller's Science of Language, vol. I., chaps. 1-7; Brachet's Historical French Grammar.

* Students seeking a First or Second Class at the Sessional Examinations are examined in this additional work which is not read in class; such students are also required to show special accuracy in grammar.

† A passage taken from a work not previously named will be set for translation to Students seeking a First or Second Class in these years.

GREEK.

FIRST YEAR'S CLASS.

Lucian: Select Dialogues; * *Xenophon*: *Cyropædia*, Book I.
Grammar: Text Book, Hadley's Elements of Greek Grammar.

SECOND YEAR'S CLASS.

Xenophon: *Memorabilia*, Book I.; *Homer*: *Odyssey*, Book IX.;
 * *Demosthenes*: *Olynthiacs*.
Composition: *Initia Græca*, Part III.

† THIRD AND FOURTH YEAR'S CLASS.

Plato: *Apologia Socratis*; *Euripides*: *Medea*.
Composition: *Initia Græca*, Part III.

‡ CLASSICAL HISTORY AND GEOGRAPHY.

SECOND YEAR.

History of Rome to B. C. 31; Geography of Italia, Sicilia, Gallia, Hispania.

THIRD YEAR.

History of Greece to the death of Alexander. Geography of Græcia, Asia, Africa.

Books recommended: Liddell's Students' History of Rome; Smith's Students' or Cox's History of Greece; Pillans' Classical Geography, or Tozer's Primer.

MATHEMATICS.

FIRST YEAR.

ARITHMETIC.—Revision of the Theory of Proportion, Vulgar and Decimal Fractions.

ALGEBRA.—Common Measure, Involution, Evolution, the Arithmetical Extraction of Roots, Fractions, Equations of the First and Second Degree, Proportion, Inequalities, Variation, Progressions, Indeterminate Equations.

GEOMETRY.—First and Second Books of Euclid revised, Third and Fourth Books, Definitions of Fifth, and Sixth Book to the Twentieth Proposition, with Geometrical Exercises and Practical applications.

PLANE TRIGONOMETRY.—Solution of Plane Triangles.

SECOND YEAR.

GEOMETRY.—Sixth Book of Euclid finished; Geometrical Exercises continued; Geometrical Drawing.

PLANE TRIGONOMETRY.—Circular and Gradual Measure; Functions of sum and difference of angles, &c.; Relations of the sides and angles of triangles; Mensuration of Heights and Distances; Elementary Problems in Navigation; Use of Logarithms.

SPHERICAL TRIGONOMETRY.—As far as the solution of Right Angled Triangles.

ALGEBRA.—Propositions in Theory of Equations; Binomial Theorem; Properties of Logarithms; Compound Interest; Annuities.

* Students seeking a First or Second Class at the Sessional Examinations are examined in this additional work which is not read in class: such students are also required to show special accuracy in grammar.

† A passage taken from a work not previously named will be set for translation to Students seeking a First or Second Class in these years.

‡ The examinations in these subjects will be held at the beginning of the Winter Session. (See § IV.)

EXTRA.

GEOMETRY.—21 Propositions of the Eleventh Book of Euclid; Geometrical Exercises.

TRIGONOMETRY.—Extension of Ordinary Course.

ALGEBRA.—Permutations, Combinations, Probabilities, Life Assurance, Investigation of Binomial Theorem and Theory of Logarithms; Indeterminate Co-efficients, with application to Expansions and Series.

Books recommended: For First Year—Hamblin Smith's (Miller & Co.) Elements of Geometry, or Colenso's or Todhunter's; Colenso's or H. Smith's Algebra. For Second Year—Colenso's Algebra, 2nd part; Colenso's Trigonometry, 1st part; Todhunter's Spherical Trigonometry; or Hann's Trigonometry, (Weale's Series); Chambers's Logarithmic, &c., Tables.

PHYSICS.

MATHEMATICAL PHYSICS.

Velocity, Acceleration, Projectiles, Harmonic Motion, Rotation, Force, Momentum, Impulse, Energy, Composition of Forces, Centrifugal Force, Pendulum, Centre of Mass, Moments of Force, Moments of Inertia, Parallel Forces, Centres of Inertia and Gravity, Couples, Degrees of Freedom, Conditions of Equilibrium, Simple Machines, Friction, Impact.

Text Book: Wormell's Principles of Dynamics. Candidates for First Class will be examined on Maxwell's Matter and Motion.

EXPERIMENTAL PHYSICS.

Properties of Solids, Liquids, and Gases; the Law of the Conservation of Energy; Heat, Electricity and Magnetism, Light and Radiant Heat, Sound.

Text Book: Balfour Stewart's Lessons in Elementary Physics. Candidates for First Class will be examined on parts of Maxwell's Theory of Heat, and Cumming's Theory of Electricity.

ASTRONOMY.

Text Book: Ball's Elements of Astronomy (one of Longmans' Text Books of Science).

ETHICS.

(Fourth Year.)—*Text Books:* Stewart's Active and Moral Powers of Man. Whewell's Elements of Morality.

POLITICAL ECONOMY.

(Fourth Year.)—*Text Books:* Mill's Political Economy. Senior's Political Economy.

LOGIC AND PSYCHOLOGY.

(Second Year.)—*Text Books:* Sir William Hamilton's Lectures on Logic. Prof. Lyall's "Intellect, the Emotions, and the Moral Nature."

METAPHYSICS AND ÆSTHETICS.

(Third Year.)—*Text Books*: Sir William Hamilton's Lectures on Metaphysics. Mansel's Metaphysics. Lewes' Biographical History of Philosophy. Cousin on the Beautiful. Allison's Essays on the Nature and Principles of Taste.

RHETORIC.

The course includes Style, Figures of Speech, Composition, Description, Narration, Exposition, Oratory, Poetry.

Text Book: Rhetoric and English Composition, by Alex. Bain, LL.D.

HISTORY.

(Fourth Year.)—*Text Books*: Taylor's Modern Europe. Gibbon's Decline and Fall of the Roman Empire. Hallam's Middle Ages. Green's History of the English People. Student's History of France. Student's History of Germany. Hallam's Constitutional History.

MODERN LANGUAGES.

FRENCH.

THIRD YEAR IN ARTS AND SECOND YEAR IN SCIENCE.

Scribe: "Le Diplomate," and Voltaire: "Charles XII."

Grammar: The Accidence; Translation from English writers; Dictation and Parsing.

FOURTH YEAR IN ARTS AND THIRD YEAR IN SCIENCE.

Racine: "Iphigénie"; Molière: "L'Avare."

Grammar: Syntax; Translation from English writers.

FOURTH YEAR IN SCIENCE.

Corneille: "Le Cid"; Molière: "Les Femmes Savantes."

Grammar and Translation as in Third Year.

GERMAN.

THIRD YEAR IN ARTS AND FIRST YEAR IN SCIENCE.

Adler's Reader, and Schiller's "Wilhelm Tell."

FOURTH YEAR IN ARTS AND SECOND YEAR IN SCIENCE.

Schiller's "Maria Stuart"; Goethe's "Hermann und Dorothea."

THIRD AND FOURTH YEARS IN SCIENCE.

Lessing's "Minna von Barnhelm," and Goethe's "Faust," Part I. Otto's German Grammar. Translation from English writers.

HEBREW.

(Fourth Year.)—*Text Book*: Green's Elementary Hebrew Grammar, with Reading and Writing lessons and Vocabularies.

CHEMISTRY.

THEORETICAL CHEMISTRY.

INORGANIC.—*Second Year of Arts Course and First Year of Science Course.*

General Principles: Chemical Affinity; Combination; Mixture; Solution; Suspension; Laws of Combination, by weight, by volume; Equivalent Numbers; Atomic Numbers; Atomic Theory; Nomenclature; Notation; Formulæ; Equations; Elements and their modes of occurrence in Nature, their preparation, their compounds, important Chemical Processes, natural and artificial, and manufactures, to which they are related; the Metals, their general characters, classification, occurrence in nature; metallurgical processes, Alloys; description of all the important Metals, their Salts and other compounds, and of chemical processes and manufactures connected with them, modes of testing, etc.

Class Book: Green's Edition of Wurtz's Elements of Chemistry, or Fownes' Manual of Chemistry, or Roscoe.

ORGANIC.—*Second Year of Science Course.*

Principles of Classification. Organic Series. Comparison of the principal series of the Fatty Group, viz: Paraffines and Olefines; Monatomic, Diatomic, Triatomic and Hexatomic Alcohols and Ethers; Monatomic, Diatomic and Tetratomic Acids; Aldehydes, Cyanogen. Comparison of Amines, Diamines, Triamines; Artificial Bases; Alkaloids; Phosphines, Stibines, Arsines; Amides (including Urea and its derivatives); Uric Acid; Colouring Matters. Outline of Animal Chemistry—Tissues, Blood, Milk, Urine; Respiration, Digestion, Nutrition.

LABORATORY PRACTICE.

Preparation and Examination of Gases, Liquids and Solids, chiefly the Metalloids and their combinations with each other. Collection of Gases. Use of Pneumatic Trough. Fitting up of Glass Apparatus. Analysis and Synthesis of Water. Air. Illustration of meaning of terms: *Base, Acid, Salt, Neutralization, Combustion, Solubility, Affinity*, &c. Illustrations of processes of *Crystallization, Distillation, Oxidation*, &c. Systematic Analysis (commenced).

Flame Reactions. Use of Spectroscope.

Text Book: Laboratory Practice and Qualitative Analysis, by Thorpe and Muir.

The class meets three times a week in the afternoon.

QUALITATIVE CHEMICAL ANALYSIS.

Systematic Qualitative Analysis. Detection of Bases and Acids, separate and in mixtures.

Will's Tables of Chemical Analysis.

Qualitative Analysis, Fresenius, Thorpe, or Appleton.

Class meets in the afternoon.

QUANTITATIVE CHEMICAL ANALYSIS.

The Laboratory will be open daily (except Saturday) from 9 A. M. to 1 P. M., for work in this department. There is a reference library in the Balance Room for the use of Students.

BOTANY.

Morphology of the Cell, of the Tissues, and of the External Conformation of Plants. Special Morphology of Thallophytes, Characæ, Muscineæ. Muscular forces in the Plant, Aggregation of Organized Structures, Movements of Water and Gases. Chemical Processes, Constituents of Plant Food, Assimilation, Respiration. Influence of Temperature, Light, Electricity, Gravitation. Mechanical Laws of Growth, Tension, Pressure, Friction. Periodicity of Growth, Periodic Movements, Reproduction. Hybridization. Origin of Species. Origin of Varieties. The Theory of Descent. Classification, including a Description of the Principal Natural Orders of American Plants. Geographical Botany. Outline of Vegetable Palæontology.

Histology.—In connection with the Botanical Class.—Instruction will be given in the general use of the Microscope, the preparation and mounting of Vegetable Tissues, and the Microscopical Observation of Vital phenomena in living plants.

On Saturdays during favorable weather there will be Field Excursions for collecting Botanical Specimens.

GEOLOGY.

FIRST WINTER SESSION: (*Historical Geology.*)—Text Book: Dana's Text Book (*last edition*).

SUMMER SESSION: (*Practical Geology and Mineralogy.*)—In the Field and Museum.

SECOND WINTER SESSION: (*Petrography, Stratigraphy, Dynamics, Physiography, Palæontology.*)—Lecture Notes.

§ XV.—HONOUR COURSES.

I.—CLASSICS.

LATIN.—Plautus: Trinummus.

Terence: Heautontimoroumenos.

Virgil: Georgics, Books I, IV.

Horace: Epistles, Books I, II., Ars Poetica.

Juvenal: Satires, VII., VIII., XIV.

Cicero: De Oratore, Books I, II.

Tacitus: Germania, Agricola.

GREEK.—Æschylus: Agamemnon.

Sophocles: Œdipus Coloneus.

Homer: Odyssey, Books V.—VIII.

Thucydides: Book VII.

Plato: Phædo.

Demosthenes: De Corona.

COMPOSITION.—Latin Prose.

PHILOLOGY.—Müller's Science of Language, Vol. I., Chaps. 1—7.

Peile's Introduction to Greek and Latin Etymology.
Class Lectures.

LITERATURE.—Müller and Donaldson's History of Ancient Greek Literature (the portions bearing on the authors and subjects of the course); Roman Classical Literature (Brown's), Selected chapters; Theatre of the Greeks, (Donaldson), Selected portions.

II.—MATHEMATICS AND PHYSICS.

MATHEMATICS.

TRIGONOMETRY.—DeMoivre's Theorem and Angular Analysis. Theory of Equations, with Horner's Method of Solution, and Sturm's Theorem.

ANALYTICAL GEOMETRY.—The Straight line, the Circle, Parabola, Ellipse, Hyperbola. The Locus of the General Equation of the Second Degree between two Variables.

DIFFERENTIAL CALCULUS.—Differentiation: Theorems of Leibnitz, Maclaurin, and Taylor; Maxima and Minima of functions of one Variable; Expansion of functions of two Variables; Maxima and Minima of such Functions; Radius of Curvature, Osculating Circle; Envelopes; the tracing of Curves by means of their Equations.

INTEGRAL CALCULUS.—Integration of Simple Forms; Integration by Parts, and Formulæ of Reduction. Integration by Substitution, &c. Applications to determine Lengths of Curves, Surfaces, Volumes, &c.; Differential Equations, (selected course,) Application to Physical Investigation: *e. g.*, Centre of Gravity, Attraction. Central Forces, &c.

BOOKS RECOMMENDED—(In order of preference).

Todhunter's Spherical Trigonometry.

Todhunter's Plane Trigonometry, or Colenso's (2nd part).

Todhunter's, Puckle's, or Salmon's Conic Sections.

Hall's, Hind's, or Todhunter's Differential and Integral Calculus.

Todhunter's or Young's Theory of Equations.

Boole's Differential Equations.

PHYSICS.

Selected chapters in Kinematics, Dynamics of a Particle and of a Rigid Body (including Statics and Kinetics), Hydrodynamics, Thermodynamics, Electrodynamics and Optics.

No one text book can be recommended; but advice will be given by the Professor during the course of lectures as to the books which should be consulted.

III.—MENTAL AND MORAL PHILOSOPHY
AND POLITICAL ECONOMY.

LOGIC.

Sir William Hamilton's Lectures on Logic. Whately's Logic, Books II., III., IV. Mill's Logic, I., II. Bacon's Novum Organum.

METAPHYSICS AND ÆSTHETICS.

Descartes' Principles of Philosophy. Reid's Essays, VI. Sir William Hamilton's Lectures on Metaphysics. Sir William Hamilton's Philosophy of Perception and Philosophy of the Unconditioned. Lewes' Biographical History of Philosophy. Cousin's Philosophy of the Beautiful. Allison's Essays on the Principles of Taste. Burke on the Sublime and Beautiful.

ETHICS.

Mackintosh's Dissertation on the Progress of Ethical Philosophy.

Butler's Sermons on Human Nature, with the Preface and the Dissertation on the Nature of Virtue.

Smith's Theory of Moral Sentiments.
 Thomson's Christian Theism.
 Aristotle's Ethics, Books I., III., VI., X. (in English).

POLITICAL ECONOMY.

Smith's Wealth of Nations, by McCulloch.
 Principles of Political Economy, by Bowen.
 Plato's Republic, Books I. and IV. (in English).

IV--EXPERIMENTAL PHYSICS AND CHEMISTRY.

EXPERIMENTAL PHYSICS.

Properties of Solids, Liquids and Gases, including the principles of the Kinetic Theory of Gases.

Heat, including the principles of the Dynamical Theory.

Sound, Light and Radiant Heat, including the principles of the Undulatory Theory.

Electricity and Magnetism.

The Conservation of Energy as the great experimental law of Physical Phenomena.

No more profound Mathematical knowledge will be demanded than is necessary for the Bachelor degree. Candidates will be required to shew considerable familiarity with the methods of determining physical constants, such as the *specific heat*, the *specific inductive capacity*, the *electrical and thermal conductivity*, the *velocity of light*, the *declination*, &c., and with the physical methods and instruments usually employed in chemical research.

Books on the above subjects will be suggested to candidates by the Professor of Physics. Practice in Experimental work may be had in the Physical Laboratory.

CHEMISTRY.

A Course of Extra Study will be prescribed by the Professor, who will explain the nature and extent of the work to be done, and advise what books should be read and consulted.

V.--BOTANY AND GEOLOGY.

BOTANY.

Candidates for Honours will be required to form a Herbarium, consisting of properly prepared specimens of the Native Plants of the District in which they reside during the Summer, all carefully named and classified according to the Natural System. The determinations of species must be done from books, without other assistance, and the examination questions will be so framed as to test the Candidate's knowledge of the distinctive characters of the species contained in his Herbarium.

GEOLOGY.

Candidates will be examined in Dana's Manual of Geology (last edition), Chapman's Outline of the Geology of Canada, and Nicholson's Manual of Palæontology, and will be required to make a report on a field selected by the Professor.

TIME TABLE—WINTER SESSION, 1881-82.

HOURS.	FIRST YEAR.	SECOND YEAR.	THIRD YEAR.	FOURTH YEAR.
9—10 A. M.	Inorganic Chemistry (daily till February.)	Inorganic Chemistry (daily till February.)	Hon. Classics () French (Science) (Tu. Th.) German (Science) (M. W. F.)	Hon. Classics () French (Arts) (Tu. Th.) German (Science) (M. W. F.)
10—11 A. M.	Mathematics (daily).	Latin (M. W. F.) Greek (Tu. Th.)		History. Organic Chemistry (Tu. Th.)
11—12 M.	Latin (M. W. F.) Greek (Tu. Th.)	Mathematics (daily). Organic Chemistry (Tu. Th.)	Math. Physics (Tu. Th.) Exp. Physics (M. W. F.)	Ethics (daily). Exp. Physics (M. W. F.)
12—1 P. M.	Rhetoric (daily.)	Extra Mathematics (Fr.) Zoology (Tu. Th.)	Latin (M. W. F.) Greek (Tu. Th.)	Latin (M. W. F.) Greek (Tu. Th.) Astronomy, (Tu. Th.) Hon. Physics ()
1—2 P. M.			Hon. Mathematics.	Hon. Mathematics.
2—3 P. M.	German (Science) (M.W.F.)	French (Science) (Tu. Th.)	German (Arts) (M. W. F.) French (Arts) (Tu. Th.)	
3—4 P. M.		German (Science) (M.W.F.) Logic (M. W. F.)	Metaphysics (Tu. Th.) Logic (M. W. F.)	German (Arts) (M. W. F.) French (Science) (Tu. Th.) Hebrew (Tu. Th.)
4—5 P. M.			Geology ()	Geology ()

DEGREES, 1880-81.

MASTER OF ARTS.

NOVEMBER, 1880.

DAVID F. CREELMAN, B. A. Shelburne.

APRIL, 1881.

WILLIAM C. HERDMAN, B. A. Elmsdale.
EDMUND L. NEWCOMBE, B. A. Kentville.

BACHELOR OF ARTS WITH HONOURS.

APRIL, 1881.

HUGH GRAHAM CREELMAN Stewiacke.

ORDINARY DEGREE OF BACHELOR OF ARTS.

NOVEMBER, 1880.

CHARLES W. BLANCHARD Truro.
HENRY S. CREIGHTON Dartmouth.

APRIL, 1881.

ALFRED COSTLEY Halifax.
WALLACE M. MACDONALD Halifax.
JAMES A. SEDGEWICK Musquodoboit.
WILLIAM H. SPENCER Londonderry.

LIST OF PRINCIPAL DISTINCTIONS, 1880-81.

UNDERGRADUATES IN ARTS.

FOURTH YEAR.

- H. G. CREELMAN: The Governor-General's Gold Medal; B. A. Honours of the Second Rank in Mathematics and Physics; First Class Certificate of Merit; Prize in Physics; First in German; First Class in Latin, Physics, German.
- J. A. SEDGEWICK: The Dr. Avery Prize; Second Class Certificate of Merit; Prize in Classics; First Class in Greek.

THIRD YEAR.

- J. S. TRUEMAN: First Class Certificate of Merit; Prize in Classics; First Class in Latin, Greek, Metaphysics and French.
- G. M. CAMPBELL: First Class Certificate of Merit; Prize in Metaphysics; First Class in Greek, Metaphysics, French, Classical History.
- HUMPHREY MELLISH: Second Class Certificate of Merit; Prize in French; First Class in French.
- G. S. CARSON: Prize in Physics; First Class in Metaphysics.

SECOND YEAR.

- J. A. BELL: The Waverley Bursary; First Class Certificate of Merit; Prize in Classics; First Class in Latin, Greek, Mathematics and Classical History.
- J. W. MCLENNAN: Second Class Certificate of Merit; Prize in Logic; First Class in Logic, Chemistry and Classical History.
- T. S. MCGREGOR: Second Class Certificate of Merit; First Class in Mathematics and Chemistry.
- J. A. MACDONALD: The St. Andrew's Prize; Second Class Certificate of Merit; First Class in Classical History.
- H. DICKIE: Prize in Inorganic Chemistry; First Class in Logic and Chemistry.
- H. MCINNES: First Class in Chemistry.

FIRST YEAR.

- J. P. MCLEOD (*Prince of Wales College, Charlottetown*): Munro Bursary; First Class Certificate of Merit; First Prizes in Classics and Mathematics; Prize in Rhetoric; First Class in Latin, Greek, Mathematics and Rhetoric.
- H. ELLIOTT (*Private Study*): Munro Bursary; First Class Certificate of Merit; Second Prize in Mathematics; First Class in Greek, Mathematics and Rhetoric.
- H. S. ADAMS (*Halifax High School*): First Professors' Scholarship; First Class Certificate of Merit; Second Prize in Classics; First Class in Latin and Greek.
- FRANK JONES (*Digby Academy*): Munro Bursary; Second Class Certificate of Merit; First Class in Latin and Rhetoric.
- E. M. DILL (*Private Study*): Munro Bursary; Second Class Certificate of Merit; Second Young Prize in Elocution; First Class in Mathematics.
- JOHN PITBLADO (*Private Study*): Second Professors' Scholarship; Second Class Certificate of Merit; First Class in Mathematics.
- D. I. MORRISON (*Pictou Academy*): Munro Bursary; Second Class Certificate of Merit; First Class in Mathematics.

UNDERGRADUATES IN SCIENCE.

THIRD YEAR.

A. G. CAMERON: Prize in Geology; First Class in Geology; Chemical Laboratory and Zoology.

SECOND YEAR.

A. G. REID: First Class Certificate of Merit; Prizes in Mathematics, German and Organic Chemistry; First Class in Latin, Mathematics, Zoology, Organic Chemistry, Chemical Laboratory and German.

J. A. MOREN: Second Class Certificate of Merit; Prize in Zoology; First Class in Zoology and Chemical Laboratory.

FIRST YEAR.

H. M. SMITH: Professors' Scholarship.

GENERAL STUDENTS.

THOMAS STEWART: Special Certificate of Merit of Second Class; Prizes in Ethics and French; First Class in Ethics and French.

W. M. FRASER, B. Sc.: Prize in Metaphysics (resigned in favour of the Student next in order of merit); First Class in Metaphysics.

J. E. FORSYTH: First Young Prize in Elocution.

A. HARE: Special Prize in Geology; First Class in Geology.

A. MCKEIGAN: First Class in Rhetoric.

HONOURS, PRIZES, CERTIFICATES OF MERIT, BURSARIES, SCHOLARSHIPS.

B. A. HONOURS.

MATHEMATICS AND PHYSICS—Second Rank—Hugh Graham Creelman.

UNIVERSITY PRIZES.

CLASSICS: *Fourth Year*, J. A. Sedgewick. *Third Year*, J. S. Trueman. *Second Year*, J. A. Bell. *First Year*, (1) J. P. McLeod; (2) H. S. Adams.

MATHEMATICS: *Second Year*, A. G. Reid. *First Year*, (1) J. P. McLeod; (2) H. Elliott.

OPTICS AND ASTRONOMY: H. G. Creelman.

PHYSICS: G. S. Carson.

ETHICS: T. Stewart.

METAPHYSICS: (1) W. M. Fraser, B. Sc.; (2) G. M. Campbell.

LOGIC: J. W. McLennan.

RHETORIC: J. P. McLeod.

CHEMISTRY (*Organic*): A. G. Reid; (*Inorganic*): H. Dickie.

GEOLOGY: A. G. Cameron.

ZOOLOGY: J. A. Moren.

FRENCH: *Fourth Year*, T. Stewart. *Third Year*, H. Mellish.

GERMAN: A. G. Reid.

SPECIAL PRIZES.

THE ST. ANDREW'S PRIZE: J. A. Macdonald.

THE SIR W. YOUNG ELOCUTION PRIZES: (1) J. E. Forsyth; (2) E. M. Dill.

THE WAVERLEY BURSARY: J. A. Bell.

THE DR. AVERY PRIZE: J. A. Sedgewick.

THE GOVERNOR-GENERAL'S GOLD MEDAL: H. G. Creelman.

CERTIFICATES OF MERIT.

(The names in the several years are arranged alphabetically.)

FIRST CLASS: *Fourth Year*, H. G. Creelman. *Third Year*, G. M. Campbell, J. S. Trueman. *Second Year*, J. A. Bell, A. G. Reid. *First Year*, H. S. Adams, H. Elliott, J. P. McLeod.

SECOND CLASS: *Fourth Year*, J. A. Sedgewick. *Third Year*, H. Mellish. *Second Year*, J. A. Macdonald, T. S. McGregor, J. W. McLennan, J. A. Moren. *First Year*, E. M. Dill, F. Jones, D. I. Morrison, J. Pitblado.

SPECIAL CERTIFICATE OF MERIT.

SECOND CLASS: Thomas Stewart.

THE MUNRO BURSARIES.

1. (Island of Cape Breton): Not awarded.
2. (Pictou, Antigonish, Guysborough): D. I. Morrison, Pictou, (Pictou Academy).
3. (Colchester, Cumberland, Hants): E. M. Dill, Hants, (private study).
4. (Halifax, Kings, Lunenburg): Hiram Elliott, Kings, (private study).
5. (Annapolis, Digby, Yarmouth, Shelburne, Queens): Frank Jones, Digby, (Digby Academy).
6. (New Brunswick): Not awarded.
7. (Prince Edward Island): John P. McLeod, Valleyfield, (Prince of Wales College, Charlottetown).

PROFESSORS' SCHOLARSHIPS.

IN ARTS: (1) Henry S. Adams, Halifax High School.
(2) John Pitblado, private study.

IN SCIENCE: Henry M. Smith, private study.

EXAMINATIONS.

MATRICULATION EXAMINATION, OCTOBER, 1880.

(The names are arranged alphabetically.)

ARTS.

FIRST YEAR: Adams, Calder, Dill, Elliott, Hamilton, Jones, Don.
McDonald, J. P. McLeod, Miller, Morrison, J. Pitblado, Taylor.

SCIENCE.

FIRST YEAR: Kaye, Trueman, Slayter, Smith.

SUPPLEMENTARY EXAMINATION, OCTOBER, 1880.

THIRD YEAR: *Metaphysics*, Spencer.

SECOND YEAR: *Logic*, Knowles.

ENTRANCE EXAMINATION IN CLASSICAL HISTORY.

(The names are in order of merit.)

THIRD YEAR: Class I., Campbell. Class II., Fraser, J. S. Trueman.
Passed, Mellish, Carson, Davidson, Patterson.

SECOND YEAR: Class I., (Bell, McLennan,) J. A. Macdonald. Class II.,
J. McLeod. *Passed*, McInnes, A. Campbell, McGregor.

SUPPLEMENTARY EXAMINATION IN CLASSICAL HISTORY.

THIRD YEAR: Knowles, Torey.

SECOND YEAR: Dickie, McKenzie, McRae.

SESSIONAL EXAMINATIONS, APRIL, 1881.

GENERAL PASS LIST

(containing the names of undergraduates who passed in all the subjects proper to their years).

(The names are arranged alphabetically.)

ARTS.

FOURTH YEAR: H. G. Creelman, A. Costley, Wallace M. Macdonald,
J. A. Sedgewick, W. H. Spencer.

THIRD YEAR: G. M. Campbell, G. S. Carson, W. R. Fraser, James K.
Knowles, Robert Landells, Humphrey Mellich, Geo. Patterson,
Edgar Torey, James S. Trueman.

SECOND YEAR: J. A. Bell, J. A. Macdonald, Hector McInnes, T. S.
McGregor, J. W. McKenzie, J. W. McLennan.

FIRST YEAR: Adams, Blair, Dill, Elliott, Jones, Don. McDonald, J. P.
McLeod, Miller, Morrison, Pitblado, Taylor.

SCIENCE.

SECOND YEAR: McColl, Moren, Reid.

FIRST YEAR: Smith.

GENERAL STUDENTS WHO PASSED IN ALL THE SUBJECTS PROPER TO ANY ONE YEAR.

FOURTH YEAR IN ARTS: Stewart.

CLASS LISTS

(containing the names of Undergraduates and General Students who passed in the various subjects of the course).

(The names are in order of merit.)

LATIN.

THIRD AND FOURTH YEARS: Class I., (Creelman, J. S. Trueman). Class II., Stewart, Sedgewick, Costley. *Passed*, Fraser, Knowles, Spencer, Carson, Patterson, Torey, Landells, W. M. Macdonald.

SECOND YEAR: Class I., Bell, Reid. Class II., Moren, J. A. Macdonald, McGregor. *Passed*, McInnes, McLennan, J. McLeod, McKenzie, Dickie.

FIRST YEAR: Class I., J. P. McLeod, Adams, Jones. Class II., (Miller, Pitblado), Elliott, Smith, Morrison, Dill, Blair. *Passed*, Taylor, H. Trueman, Slayter, Don. McDonald, Hamilton, Calder.

GREEK.

THIRD AND FOURTH YEARS: Class I., J. S. Trueman, (Sedgewick, Geo. M. Campbell). Class II., Mellish, Spencer. *Passed*, Stewart, Patterson, Fraser, Carson, Costley, Landells, W. M. Macdonald.

SECOND YEAR: Class I., Bell. Class II., J. A. Macdonald. *Passed*, McLennan, McGregor, J. McLeod, McInnes, Dickie, McKenzie.

FIRST YEAR: Class I., J. P. McLeod, Elliott, Adams. Class II., Dill, Pitblado, Jones, Morrison. *Passed*, W. M. Fraser, B. Sc., Blair, Taylor, Don. McDonald, Miller.

MATHEMATICS.

SECOND YEAR: Class I., Reid, McGregor, Bell. Class II., J. A. Macdonald, McLennan. *Passed*, McColl, Moren, McKenzie, McRae, McInnes. *Passed in Geometry, but not in Trigonometry*, A. Campbell.

FIRST YEAR: Class I., J. P. McLeod, Elliott, Morrison, Pitblado, Dill. Class II., McKeigan, Adams. *Passed*, Hamilton, Jones, McDonald, Smith, Blair, Taylor, Miller. *Passed in Geometry, but not in Algebra*, H. Trueman, Currie, Storey.

MATHEMATICAL AND EXPERIMENTAL PHYSICS.

Class I., None. Class II., Carson, G. M. Campbell. *Passed*, Mellish, Torey, Landells, Patterson, Knowles, Davidson, W. R. Fraser.

EXPERIMENTAL PHYSICS.

Passed, J. S. Trueman.

OPTICS AND ASTRONOMY.

Class I., Creelman. Class II., Stewart. *Passed*, Spencer, Costley, Sedgewick, W. M. Macdonald.

ETHICS.

Class I., Stewart. Class II., Costley, (Sedgewick, Creelman). *Passed*, Spencer, W. M. Macdonald.

METAPHYSICS.

Class I., W. M. Fraser. B. Sc, G. M. Campbell, Carson, J. S. Trueman.
Class II., Mellish, Landells, (Fisher, Patterson), Torey. *Passed*, Davidson, Knowles.

LOGIC.

Class I., McLennan, Dickie. Class II., McInnes, J. A. Macdonald.
Passed, Bell, McKenzie, McGregor.

RHETORIC.

Class I., J. P. McLeod, Jones, Elliott, McKeigan. Class II., Dill,
Adams, Don. McDonald, (Blair, Morrison), Pitblado. *Passed*,
Taylor, Logan, Miller, Hamilton.

INORGANIC CHEMISTRY.

Class I., Dickie, McGregor, McInnes, McLennan, Moren Class II.,
J. A. Macdonald, Campbell, Bell, H. Trueman. *Passed*, Smith,
Slayter, Kaye, McRae, J. McLeod, McKenzie, Currie.

ORGANIC CHEMISTRY.

Class I., Reid. Class II., Moren, Davidson. *Passed*, McColl.

ZOOLOGY.

Class I., Moren, Cameron, Reid. Class II., McColl.

FRENCH.

FOURTH YEAR: Class I., Stewart. Class II., Sedgewick, Costley.
Passed, W. Macdonald, Spencer.

THIRD YEAR: Class I., Mellish, G. M. Campbell, J. S. Trueman.
Class II., Patterson. *Passed*, Knowles, Moren, Torey, Fraser,
Davidson, McColl, Landells, Carson, Ross, Cameron.

GERMAN.

FOURTH YEAR: Class I., Creelman. Class II., Cameron.

THIRD YEAR: Class I., Reid. Class II., Torey. *Passed*, Knowles,
McColl.

GENERAL LIST OF HONOURS, MEDALS,
SCHOLARSHIPS, SPECIAL PRIZES, &c., 1866-81.

HONOURS.

- 1873—MATHEMATICS AND PHYSICS: *Second Rank*, Alex. H. McKay.
 1874—CLASSICS: *Second Rank*, James Chalmers Herdman.
 MENTAL AND MORAL PHILOSOPHY: *Second Rank*, James McD.
 Oxley.
 1876—MATHEMATICS AND PHYSICS: *Second Rank*, Jas. McG. Stewart.
 CLASSICS: *Second Rank*, Francis H. Bell.
 1877—MATHEMATICS: *Second Rank*, John Waddell.
 1879—CLASSICS: *Second Rank*, Isaac M. McLean.
 HISTORY AND ENGLISH LITERATURE: *Second Rank*, Charles S.
 Cameron.
 1880—HISTORY AND ENGLISH LITERATURE: *Second Rank*, Edwin
 Crowell.
 1881—MATHEMATICS AND PHYSICS: *Second Rank*, H. G. Creelman.

THE GOVERNOR-GENERAL'S MEDALS.

- 1875—*Gold Medal*: Louis H. Jordan. *Silver Medal*: George McMillan.
 1876—*Gold Medal*: Francis H. Bell. *Silver Medal*: Jas. McG. Stewart.
 1877—*Gold Medal*: John Waddell. *Silver Medal*: Burgess McKittrick.
 1878—*Gold Medal*: J. L. George. *Silver Medal*: J. H. Cameron.
 1880—*Gold Medal*: Edwin Crowell. *Silver Medal*: W. M. Fraser.
 1881—*Gold Medal*: H. G. Creelman. *Silver Medal*: Not awarded.

PROFESSORS' SCHOLARSHIPS.

- 1866—1. A. P. Silver, Halifax Grammar School; 2. A. W. H. Lindsay,
 Pictou Academy.
 1867—1. James G. MacGregor, private study; 2. Jas. M. Inglis, Prince of
 Wales College, Charlottetown, P. E. I.
 1868—1. Alex. W. Pollok; 2. W. P. Archibald, Halifax Schools.
 1869—1. Charles D. Macdonald, Pictou Academy; 2. Bruce A. Lawson;
 3. Henry Macdonald, Halifax Schools.
 1870—1. Andrew C. Herdman, Pictou Academy; 2. Alex. C. Patterson,
 Fort Massey Academy.
 1871—1. William Brownrigg, Pictou Academy; 2. George McMillan,
 private study.
 1872—1. Francis H. Bell, private study; 2. Fred. W. O'Brien, Pictou
 Academy.
 1873—1. Jas. McLean, private study; 2. John Waddell, Pictou Academy.
 1874—1. J. L. George, Pictou Academy; 2. John Stewart.
 1875—1. George W. McQueen, New Glasgow Academy; 2. Isaac M.
 McLean, private study.
 1876—1. Howard Murray, New Glasgow Academy; 2. W. R. Fraser.
 1877—1. H. Graham Creelman, Pictou Academy; 2. James S. Trueman,
 St. John Grammar School.
 1878—1. G. M. Campbell, Pictou Academy; 2. James T. Wyllie, Pictou
 Academy and Halifax High School.
 1879—In Arts: 1. J. Albert Bell, Halifax High School; 2. James A.
 Moren, do.; 3. James A. Macdonald, do. In Science: Arthur
 G. Reid, Halifax High School.
 1880—In Arts: 1. H. S. Adams, Halifax High School; 2. John Pitblado,
 private study. In Science: Henry M. Smith, private study.

THE GRANT PRIZE.

For Essays—1866: Joseph H. Chase. 1867: Aubrey Lippincott. 1868: Arthur P. Silver. 1869: Herbert A. Bayne. 1870: Hugh M. Scott. 1871: Duncan C. Fraser. 1872: Alexander H. McKay.

THE YOUNG PRIZES.

General Prize, voted by students. 1867: 1. John Gow, 3rd and 4th years; 2. Alexander C. McKenzie, 1st and 2nd years. 1868: 1. George Murray, 3rd and 4th years; 2. Wentworth Roscoe, 1st and 2nd years. 1869: 1. John J. McKenzie, 3rd and 4th years; 2. Hiram Logan, 1st and 2nd years. 1870: *For Essay*, Walter M. Thorburn; *For Elocution*, Duncan C. Fraser. 1871: *For Essay*, James G. MacGregor; *For Elocution*, Robert G. Sinclair. 1872: *For Essay*, Ephraim Scott; *For Elocution*, W. A. Mills. *For Elocution*, 1873: Fred. W. Archibald. 1874: Richmond A. Logan. 1875: S. J. MacKnight. 1876: 1. Francis H. Bell; 2. Colin Pitblado. 1877: H. H. Whittier; 2. G. E. Lowden. 1878: 1. J. A. Sedgewick; 2. Duncan Cameron. 1879: 1. Charles D. McLaren; 2. Edwin Crowell; 3. William F. Fraser. 1880: 1. D. A. Murray; 2. Humphrey Mellish. 1881: 1. J. E. Forsyth 2. E. M. Dill.

THE ROY PRIZES.

For Elocution, 1868: 1. Alexander G. Russell. 2. James G. MacGregor. 1869: 1. Albert R. Quinn; 2. William M. Doull.

THE NORTH BRITISH SOCIETY BURSARY.

1868: Hugh M. Scott. 1870: Ephraim Scott. 1872: Jas C. Herdman. 1874: James McG. Stewart. 1876: John H. Cameron. 1878: Albert E. Thomson. 1880: George M. Campbell.

THE DR. AVERY PRIZE.

1880: A. E. Thomson. 1881: J. A. Sedgewick.

THE WAVERLEY BURSARY.

1873: William Bearisto, Wm. B. Ross, equal. 1874: James Fitzpatrick. 1875: Jas. McLean. 1876: John Waddell. 1877: Rod. McKay. 1879: Howard Murray. 1881: J. A. Bell.

THE LAURIE PRIZE.

1871: Hugh M. Scott. 1872: Duncan C. Fraser. 1873: David F. Creelman. 1874: Archibald Gunn. 1875: Alex. McLeod. 1876: No competition. 1877: Richmond Logan.

THE ST. ANDREW'S PRIZE.

1873—FOR CLASSICS: *First Year*, John W. McLeod.
 1874—FOR MATHEMATICS: *Second Year*, John W. McLeod.
 1875—FOR CLASSICS: *Second Year*, James McLean.
 1876—FOR MATHEMATICS: *Second Year*, T. A. LePage.
 1877—FOR CLASSICS: *Second Year*, G. W. McQueen.
 1878—FOR MATHEMATICS: *Second Year*, Albert E. Thomson.
 1879—FOR CLASSICS: *Second Year*, Howard Murray.
 1880—FOR MATHEMATICS: *Second Year*, Humphrey Mellish.
 1881—FOR CLASSICS: *Second Year*, James A. Macdonald.

THE ALUMNI PRIZES,

1873: James McG. Stewart. 1874: 1. James McLean; 2. John H. Sinclair. 1875: 1. J. H. Cameron, private study; 2. R. H. Humphrey, Halifax Grammar School. 1876: *Third Year*, John Waddell (who resigned in order to hold the Waverley Prize), J.H. Sinclair. *First Year*, Roderick McKay, private study. 1877: *Third Year*, 1. J. H. Cameron; 2. Edmund L. Newcombe. *First Year*, 1. Howard Murray; 2. W. R. Fraser. 1878: *Third Year*, 1. Roderick McKay; 2. J. M. McLean. *First Year*, 1. James S. Trueman; 2. H. Graham Creelman. 1879: *First Year*, 1. G. M. Campbell; 2. G. S. Carson.

THE "UNKNOWN" PRIZE.

1873: James M. McLean.

THE GRADUATES' PRIZE.

1876: John W. McLeod. 1877: Burgess McKittrick.

THE MELBOURNE PRIZES.

1875: 1. John W. McLeod; 2. James McG. Stewart. 1876: George W. McQueen.

GRADUATES AND UNDERGRADUATES OF THE
UNIVERSITY, AND GENERAL STUDENTS.

GRADUATES.

MASTERS OF ARTS.

1869.	Chase, Jos. Henry, Onslow.	1875.	McKenzie, Hugh, Truro. Scott, Ephraim, New Glasgow.
1870.	McNaughton, Samuel, Preston, G. B. McDonald, John H., Shelburne.	1876.	Allan, John M., Madeira.
1871.	Cameron, J. J., Shakspeare, Ont. Carr, Arthur F., Alberton, P. E. I. Smith, David H., Truro.	1878.	Archibald, W. P., Cavendish, P.E.I. Herdman, James C., B.D., Camp- belton, N. B. Jordan, Louis H., B.D., Halifax. McLeod, Alexander, Onslow. Trueman, Arthur I., St. John, N.B.
1872.	Annand, Joseph, New Hebrides. Bayne, Herbert A., Ph.D., Kings- ton, Ont. Forrest, James, Halifax. Mackenzie, John J., Ph.D., (obit.)	1880.	Creelman, D. F., Shelburne. Logan, Richmond, Sheet Harbour. McLeod, John W., Trinidad.
1874.	MacGregor, J. G., D.Sc., Halifax.	1881.	Herdman, W. C., Elmsdale. Newcombe, E. L., Kentville.

DOCTORS OF MEDICINE AND MASTERS OF SURGERY.

1872.	DeWolfe, George H., England. Hiltz, Charles W., Mahone Bay. McMillan, Finlay, (obit.) McRae, William, Richmond, C. B. Sutherland, Robert, (obit.)	Chisholm, Donald, Antigonish. Moore, Edmund, Chatham.
1874.	Campbell, Don. A., Halifax.	1875. Cox, Robinson, Stewiacke. Bethune, J. L., Baddeck, C. B. Lindsay, A. W. H., Halifax. Muir, W. H., Truro. Robert, Cassimer, Arichat, C. B.

BACHELORS OF ARTS.

1866.

Chase, J. Henry, Onslow.
Shaw, Robert, Charlottetown.

1867.

Burgess, Joshua C., Carleton, N. B.
Cameron, J. J., Shakspeare, Ont.
Lippincott, Aubrey, Pittsburg, Pa.
McDonald, John H., Shelburne.
McNaughton, Saml., Preston, G. B.
Ross, Alexander, Dalhousie, N. B.
Sedgewick, Robert, Halifax.
Smith, David H, Truro.
Smith, Edwin, Stewiacke.

1868.

Carr, Arthur F., Alberton, P. E. I.
Christie, Thomas M., Trinidad.
Creighton, Jas. G. A., Montreal.
Forrest, James, Halifax.
McKay, Kenneth, Richmond, N. B.
Simpson, Isaac, LaHave.

1869.

Annand, Joseph, New Hebrides.
Bayne, Herbert A., Ph.D., Kings-
ton, Ont.
Millar, Eben. D., Lunenburg.
Mackenzie, J. J., Ph.D., (obit.)
Sutherland, Jno. M., St James, N.B.

1870.

Lindsay, Andrew W. H., Halifax.
Scott, Hugh M., B.D., Chicago.
Thorburn, Walter M., Madras.
Wallace, John, Bermuda.

1871.

Bayne, E. S., Murray Harbor, P.E.I.
MacGregor, Jas. G., D.Sc., Halifax.
Russell, Alexander G., Oyster Bay,
Long Island, N. Y.

1872.

Archibald, W. P., Cavendish, P.E.I.
Bruce, Wm. T., M.D., Coldstream.
Carmichael, Jas. M., New Glasgow.
Fraser, Duncan C., New Glasgow.
Gunn, Adam, Kennetcook.
McKenzie, Hugh, Truro.
Pollok, Alex. W., (obit.)
Scott, Ephraim, New Glasgow.
Trueman, Arthur I., St. John, N.B.

1873.

Allan, John M., Madeira.
Bryden, Chas. W., Salisbury, N. B.Cameron, William, Pictou Co.
Creelman, David F., Shelburne.
Duff, Kenneth, Manitoba.
Hunter, John, California.
Logan, Melville, Halifax.
Macdonald, Charles D., Pictou.
McKay, Alex. H., B.Sc., Pictou.
McKeen, James A., Bermuda.
Robinson, J. Millen, Halifax.
Ross, Wm., Prince William, N. B.

1874.

Doull, Walter S., Halifax.
Fraser, D. Stiles, Mahone Bay.
Herdman, Jas. C., B.D., Campbell'n.
Herdman, Wm. C., Elmsdale.
McGregor, Daniel, Merigomish.
McLeod, Don., Strathalbyn, P.E.I.
Oxley, James M., LL.B., Halifax.

1875.

Fitzpatrick, J., Salt Springs, N. S.
Jordan, Louis H., B.D., Halifax.
McLeod, Alexander, Parrsboro'.
McMillan, G. W., Princetown, P.E.I.
Stramberg, H. H., Cape John, Pictou

1876.

Bell, Francis H., Halifax.
Fulton, Geo. H., Guysborough.
McDowall, Isaac, (obit.)
McLean, James A., Barrington.
McLeod, John W., Trinidad.
Morton, Joseph, Shelburne.
Munro, John, Montreal.
Stewart, J. McG., Pictou.

1877.

Archibald, F. W., M.A., Amherst.
Chambers, Robt. E., New Glasgow.
Grant, W. R., (obit.)
Hamilton, Howard H., Pictou.
Herdman, A. W., Pictou.
Laird, George A., Manitoba.
Logan, Richmond, Sheet Harbour.
Mason, Wm. A., New London, P.E.I.
McCurdy, Stanley T., New Glasgow.
McKittrick, Burgess, Sydney, C. B.
Murray, J. S., Charlottetown, P.E.I.
Pitblado, Colin, Minneapolis.
Scott, John McD., Gore, Hants Co.
Waddell, John, Edinburgh Univ'y.

1878.

Cairns, J. A., M.A., Princeton, N.J.
Cameron, John H., Pine Hill, Hfx.
George, John L., M. A., Pictou.
McKenzie, James, Greenhill, Pictou.

Munro, George W., New York.
Newcombe, Edmund L., Kentville.
Rogers, Anderson, Pine Hill, Hfx.
Whitman Alfred, Bridgetown.

1879.

Cameron, Charles S., Baddeck,
C. B.
Chambers, Fred. B., Truro.
Dickie, Alfred, Stewiacke.
Emmerson, R. R. J., Halifax.
McLean, Isaac M., Hopewell,
Pictou.

1880.

Blanchard, Chas. W., Winnipeg.
Crowell, Edwin, Barrington.
Creighton, H. S., Dartmouth.
Kinsman, Fred. S., Centreville.
Thomson, Albert E., Halifax.

1881.

Costley, Alfred, Halifax.
Creelman, H. G., Up. Stewiacke.
Macdonald, W. M., Halifax.
Sedgewick, J. A., Halifax.
Spencer, W. H., Londonderry.

BACHELOR OF SCIENCE.

1880.

William M. Fraser, Dartmouth.

Graduates are particularly requested to notify the Principal or Secretary of Senate of any change of address.

UNDERGRADUATES IN ARTS, 1880-81.

FOURTH YEAR.

Costley, Alfred, Halifax.
Creelman, H. G., Up. Stewiacke.
Macdonald, Wallace M., Halifax.
Sedgewick, Jas. A., Musquodoboit.
Spencer, Wm. H., Great Village.

Macdonald, Jas. A., Halifax.
McGregor, T. S., Little Bras d'Or.
McInnes, Hector, Pictou.
McKenzie, James W., Strathalbyn,
P. E. I.
McLennan, J. W., Sydney, C. B.
McLeod, Jehn, Halifax.
McRae, W. L., Granton, Pictou.

THIRD YEAR.

Campbell, G. M., Truro.
Carson, G. S., Sussex, N. B.
Davidson, Johnson F., Halifax.
Fraser, W. R., Mt. Thom, Pictou.
Knowles, James H., Milton.
Landells, Robert, Halifax.
Mellish, Humphrey, Halifax.
Patterson, G. G., New Glasgow.
Torey, E. T., Guysborough.
Trueman, Jas. S., Carleton, N. B.

FIRST YEAR.

Adams, H. S., Halifax.
Blair, G. H., Truro.
Calder, W. C., Halifax.
Dill, E. M., Centre Rawdon.
Elliott, H., Weston, Cornwallis.
Hamilton, G., Dalhousie, N. B.
Jones, Frank, Digby.
McDonald, Don., Cape North, C. B.
McLeod, J. P., Valleyfield, P. E. I.
Miller, J. J., Halifax.
Morrison, D. I., Pictou.
Pitblado, J., Halifax.
Taylor, W. B., Halifax.
Whitman, E. C., Canso.

SECOND YEAR.

Bell, John A., Halifax.
Campbell, Arthur, Truro.
Dickie, Henry, Upper Stewiacke.

UNDERGRADUATES IN SCIENCE, 1880-81.

THIRD YEAR.

Cameron, A. G., Newtown, Guysboro'
McColl, Arch., New Glasgow.
Moren, James A., Halifax.
Reid, Arthur G., Halifax.

FIRST YEAR.

Kaye, F. C., Halifax.
Slayter, J. H., Halifax.
Smith, H. M., Halifax.
Trueman, H., Truemanville, Cum-
berland Co., N. B.

GENERAL STUDENTS IN ARTS, 1880-81.

Blair, J. T., St. John, N. B.	McDougall, R., Maitland.
Cameron, D., E. River. St. Mary's.	McKay, Neil, Whyocomagah.
Currie, J., Halifax.	McKeigan, A., Sydney Mines.
Fisher, G. Middle Stewiacke.	Ross, J., Halifax.
Foisyth, J. E., Cornwallis.	Skimmings, R. H., Halifax.
Fraser, W. M., B.Sc., Dartmouth.	Stewart, T. H., Whyocomagah.
Furneau, H. J., St. John's, Nfld.	Storey, E. P., Halifax.
Jennison, J. L., Halifax.	Symonds, F. A., Great Village, Londonderry.
Langill, R. M., Halifax.	Thomson, A., Halifax.
Logan, A. P., N. Sydney.	

GENERAL STUDENTS IN SCIENCE, 1880-81.

Angus, A. C., Goose River, Cumb'd.	Kelly, F. W., Shelburne.
Buchanan, R. W., Halifax.	Kingsford, H., Dover, Kent.
Cogswell, A., Dartmouth.	Macdonald, S., Halifax.
DeMill, W. B., Halifax.	Maunsell, Dr., Halifax.
Freeman, W. S., Shelburne.	McLeod, J. K., Sydney, C. B.
Gourley, J. N., Stewiacke.	Murchison, J., N. River, P. E. I.
Hare, A. A., Bedford.	Pitblado, Colin, B.A., Halifax.
Henderson, G. W., Dartmouth.	Primrose, A. J., Halifax.
Hill, A., Halifax.	Lindsay, A. W. H., B.A., M.D, C.M., Halifax.
Irwin, F., Shelburne.	Thomson, A. E., B.A., Halifax.
Jennings, E. J., Halifax.	

Undergraduates	47
General Students	40
Total	87

OFFICERS

ROBERT BROWN, B. A.	W. R. BOSS
A. M. MCKAY, H. A., B. Sc.	
E. H. BIRD, H. A.	
H. M. MURPHY, M. A.	
J. G. MACDONALD, M. A., D. Sc.	
J. M. CARMICHAEL, B. A.	
J. A. BROWN, H. A.	
A. F. BRYAN	

HONORARY MEMBERS

DR. JAMES WATSON, D. D., Professor of Mathematics, Dalhousie College.
DR. W. R. BOSS, Professor of Mathematics, Dalhousie College.
DR. J. M. CARMICHAEL, M. A., Professor of Mathematics, Dalhousie College.
DR. J. A. BROWN, H. A., Professor of Mathematics, Dalhousie College.
DR. J. G. MACDONALD, M. A., D. Sc., Professor of Mathematics, Dalhousie College.
DR. J. M. CARMICHAEL, B. A., Professor of Mathematics, Dalhousie College.
DR. J. A. BROWN, H. A., Professor of Mathematics, Dalhousie College.
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DR. J. M. CARMICHAEL, B. A., Professor of Mathematics, Dalhousie College.
DR. J. A. BROWN, H. A., Professor of Mathematics, Dalhousie College.

ALUMNI ASSOCIATION OF DALHOUSIE
COLLEGE AND UNIVERSITY.

(Incorporated 1876.)

EXTRACT FROM THE CONSTITUTION.

ART. II.—The object of the Association shall be the promotion of the best interests of the University.

ART. III., Sec. 1.—All graduates of the University and all students who have attended classes throughout one academic year shall be eligible for membership; but no person shall become a member until three years have elapsed from the time of his matriculation or first registration.

Sec. 2.—Other persons, not eligible for membership under section 1 of this Article may be elected as Honorary Members, on the nomination of the Executive.

OFFICERS.

ROBERT SEDGEWICK, B. A.....	<i>President.</i>
A. H. MCKAY, B. A., B. Sc.....	<i>Vice-President.</i>
F. H. BELL, B. A.....	<i>Secretary.</i>
W. B. ROSS.....	<i>Treasurer.</i>

HUGH MCKENZIE, M. A., J. G. MACGREGOR, M. A., D. Sc., J. M. CARMICHAEL, B. A., J. A. SEDGEWICK, B. A., A. P. SILVER,	}	<i>Members of Executive Committee.</i>
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HONORARY MEMBERS.

- VERY REV. JAMES ROSS, D. D., *Principal, Dalhousie College.*
 REV. WM. LYALL, LL. D., *Professor of Metaphysics, Dalhousie College.*
 CHARLES MACDONALD, M. A., *Professor of Mathematics, Dalhousie College.*
 JOHN JOHNSON, M. A., *Professor of Classics, Dalhousie College.*
 GEORGE LAWSON, Ph. D., LL. D., *Professor of Chemistry, Dalhousie College.*
 JAMES LIECHTI, M. A., *Professor of Modern Languages, Dalhousie College.*
 DAVID HONEYMAN, D. C. L., *Professor of Geology, Dalhousie College.*
 REV. JOHN FORREST, *George Munro Professor of History, Dalhousie College.*

MEMBERS.

NAME.	OCCUPATION.	RESIDENCE.
Allan, John M.	Clergyman	Madeira
Archibald, William P.	"	Cavendish, P. E. I.
Bayne, Herbert A., Ph. D.	Professor	R. M. Coll., Kingston
Bayne, Ernest S.	Clergyman	Murray Harbor, P. E. I.
Bell, Francis H.	Barrister	Halifax
Boak, H. W. C.	"	Halifax
Bruce William T., M. D.	Clergyman	Coldstream
Bulmer, J. T.	Barrister	Halifax
Cameron, John H.	Theol. Student	Pine Hill, Halifax
Cameron, Charles S.	Merchant	Baddeck, C. B.
Chambers, Robt. E.	"	New Glasgow
Chase, Joseph H.	Clergyman	Onslow
Carmichael James M.	Merchant	New Glasgow
Costley, A.	Halifax
Creelman, H. G.	Upper Stewiacke
Crowell, Edwin.	Theol. Student	Barrington
Cruikshank, William, B. D.	Clergyman	Montreal.
Dickie, Alfred.	Merchant	Stewiacke
Doull, Walter S.	Barrister	Halifax
Doull, W. M.	Merchant	Halifax
Emmerson, Robt. R. J.	Halifax
Forrest, James	Banker	Halifax
Fraser, Dnncan C.	Barrister	New Glasgow
Fraser, W. M.	Analyst	Halifax
Fitzpatrick, James	Clergyman	Salt Springs, Pictou.
Fraser, D. Stiles	"	Mahone Bay
Geldert, J. M.	Barrister	Halifax
George, John L., M. A.	Pictou
Hamilton, Howard H.	Manufacturer	Pictou
Henry, Hugh McD.	Barrister	Halifax
Herdman, J. C., B. D.	Clergyman	Campbellton, N. B.
Humphrey, R.	Clerk	Halifax
Humphrey, W.	Bookkeeper	Halifax
Jordan, Louis H., B. D.	Clergyman	Edinburgh
Lindsay, A. W. H., M. D.	Physician	Halifax
Logan, Richmond	Clergyman	Sheet Harbor
Miller, Eben. D.	"	Lunenburg
Mills, W. A.	Barrister	Halifax
Morton, Joseph H.	Principal of Academy	Shelburne
Munro, John	
Macdonald, Charles D.	Barrister	Pictou
Macdonald, W. M.	Law Student	Halifax
McKay, Alex. H., B. Sc.	Principal of Academy	Pictou
McKenzie, Hugh	Barrister	Truro
MacGregor, Jas. G., D. Sc.	Professor	Halifax
McLean, Jas. A.	Clergyman	Barrington
McKittrick, Burgess	Principal of Academy	Sydney, C. B.
McMillan, George W.	Clergyman	Princetown, P. E. I.
McNaughton Samuel	"	Preston, G. B.
Oxley, James McD., LL. B.	Barrister	Halifax

NAME.	OCCUPATION.	RESIDENCE.
Robinson, J. M. Russell, Alexander G. Robert, Casimir, M. D. Ross, J. T. Ross, W. B.	Theol. Student Clergyman Physician Barrister "	Halifax Oyster Bay, L. I., N. Y. Ariehat Halifax "
Scott, H. McD., B. D. Sedgewick, R. Sedgewick, J. A. Spencer, W. H. Stairs, J. F. Story, J. D. Stramberg, Hector Stewart, James McG.	Professor Barrister Law Student Manufacturer Deputy P. O. Insp'r Barrister	Chicago Halifax " Londonderry Halifax " Montreal Pictou
Thomson, A. E. Thorburn, W. M. Troop, W. H. Trueman, A. I. Tupper, Chas. H.	Medical Student India Civil Service Merchant Barrister "	Edinburgh University. Madras Presidency. Halifax St. John, N. B. Halifax
Wallace, John Whitman, Alfred W. Waddell, John West, F. S.	Clergyman Law Student Science Student Merchant	Bermuda Halifax Edinburgh University. Halifax

EXAMINATION PAPERS, 1881.

GREEK.

Examiner,..... JOHN JOHNSON, M.A.

FIRST YEAR.

XENOPHON: CYROPAEDIA, Book I.

TIME: THREE HOURS.

I.

A. Translate bk. I, chap. 1, sec. 2, beginning 'Ἐπειδὴ δὲ ἐνενοήσαμεν ὅτι Κῦρος ἐγενετο Πέρσης; ending, ἀγαπῶν δ' ἄν, εἰ τοῦ ἑαυτοῦ ἔθνος ἄρχων διαγένοίτο.

1. Account for the cases of:—τὸ ἀνθρώπων ἄρχειν—τοὺς μὲν ἀπέχον-
τας παμπόλλων ἡμερῶν ὁδόν.

2. What conjunctions may be followed by the infinitive?

3. κατεστρέψατο δὲ Σύρους, Ἀσσυρίους . . . Φρύγας ἀμφοτέρους. Where did these nations dwell?

B. Translate bk. I, chap. 4, secs. 21, 22, beginning, οἱ δ' ἀμφὶ τὸν Κῦρον ὑπετέμνοντο; ending, προθυμότεροι ὄντες ἐν τῷ τοιοῦτῳ εἰς τὸ διώκειν καὶ οἱ μὴ πᾶν πρὸς τοὺς ἐναντίους ἄλκιμοι ὄντες.

1. Explain the syntax of:—ὡς πανσομένους τοῦ διωγμοῦ.

2. What object had Xenophon in view in writing the *Cyropaedia*? Sketch his life.

3. How does Xenophon's account of Cyrus's boyhood differ from that of another writer?

II.

1. Give the gender and meaning, and write the nom. and gen. sing. of:—νομεῖς, ἔω, Κᾶρας, κρέα, γήρα, παροψίδας.

2. Form (a) accus. and voc. sing. and dat. pl. of:—Πέρσης, κύνων, θώραξ, Ἀσπνάγης, βούς, κόρυς; (b) nom. sing. and nom. pl. (all genders) of:—τοῦτον, τήνδε, σαντήν, ὄτου, μείζω, σφᾶς.

3. What words in the other degrees of comparison correspond in gender, number and case, or otherwise, to : *καλῶς, γεραιῶ, ἡδέα, μείζων ἀπλῶς, πλεῖον* ?

4. What is the Greek for : 30, 300, 300th, thrice ?

5. What is the difference between a "root" and a "stem" ? Give examples in nouns and verbs.

6. Distinguish the meanings in act. and mid. voices, of:—*πεῖθω* *δέω, ἄρχω, λούω, ἴσθημι, χράω, λανθάνω*. Also distinguish *εἶμι, ἔρχομαι, οἴχομαι* : *πονέσω, ποιήσω* : *χάριν εἶδέναι, χάριν ἀποδιδόναι*, (give Latin equivalents.)

7. Form 3rd sing. imperf. indic. (giving contracted forms) of:—*οἰκοδομέομαι, ἐστιῶ, συσκευάζω, ῥήγνυμι, δυστυχέω, περιβάλλω*.

8. What is the 1st aorist optative in the active and passive of:—*δηλόω, πράττω, διατελέω, ἀκούω, καθίστημι* ?

9. Give examples of the different ways in which verbs ending in *-τω* form the perfect passive.

10. Write the perfect infinitive passive of:—*πεῖθω, ἀγγέλλω, κελεύω, συλλέγω, δίδωμι, ἐφήμι*.

11. Parse, giving chief parts :—*ἴσμεν, δῆνεγκε, ἀγαπήν, ἐφθασαν, ἀνίει, ἐφείπετο, ἐπελέλησθε, ἐπελήλασθε*.

III.

(Additional for Candidates seeking a First or Second Class.)

XENOPHON: CYRO-PÆDIA, Book IV., Chaps. I-IV.

TIME: TWO HOURS.

A. Translate chap. II, secs. 40, 41.

1. Explain clearly the syntax of the clauses beginning, (a) *ὣν οὐκ ἄγνωῶ ὅτι δυνατὸν κ.τ.λ.* (b) *ἀλλ' οὐ μοι δοκεῖ τὸ λαβεῖν κ.τ.λ.*

2. Point out peculiarities of declension (writing the accents) of *φάος, κνέφα, γυνή*.

3. What adjectives are found in the second declension only ?

4. What verbs (a) simple and (b) compound take a double augment ?

5. Give a list of twelve futures middle that are used as fut. active.

6. Write with accents all the personal forms in the Attic dialect of
a) the aor. opt. act. of *πράττω* ; (b) fut. opt. act. of *ἀγγέλλω*.

7. Accentuate and parse these verbal forms :—*ἀποδραντες, συνεπιθε-
σθαι, δυνασθω, δεδησομαι, μαχεισθε*.

8. What are *Atenics*? Give a list of them.

9. Write in Latin :

a. *εἰ μὴδ' ἐκείνους αἰσχυντέον ἦν.*

b. *ὅπως ὡσεὶ καὶ οἱ ποιήσοντες τὰ ἐπιτήδεια.*

SECOND YEAR.

XENOPHON : MEMORABILIA, Book I, Chaps. 1-3. }
HOMER : ILIAD, Book IX. }

TIME : THREE HOURS.

I.

A. Translate Mem. bk. I., chap. 2, secs. 19, 20, 21.

1. From what author is the first quotation in this extract taken ?

2. What is unusual in the syntax of the clause :—*ὥσπερ τὰ τοῦ σώ-
ματος ἔργα τοὺς μὴ τὰ σώματα ἀσκούντας οὐ δυναμένους ποιεῖν*. Why are
different negatives used with the participles ?

3. Explain the construction of the clause :—*τῶν δὲ τῶν πονηρῶν κατὰ-
λυσιν*.

4. Account for the oblique cases in the following clauses :—

(a) *οὐτε ὧν δεῖ ἀπέχεσθαι δύνανται*.

(b) *ἐπιλέλησται καὶ ὧν ἡ ψυχὴ πάσχουσα τῆς σωφροσύνης ἐπεθύμει*.

5. Distinguish *οἶδα, γινώσκω* (giving Latin equivalents),—*οἴκων ἐν-
κοῦν—οἴνον πίνειν, οἶνον πίνειν—κῆδω τινά, κῆδομαί τινας*.

6. (a) Give all the forms in the singular of: *Σωκράτης, νείεις, ὑβριστής*.
(b) Parse, giving chief parts :—*διψῶν, ἤδεσαν, προείρησθον*.

II.

B. Translate Iliad, IX, 616-635.

1. What are the Attic forms of:—*πλείαι, πολέεσσι, ἡμαρ, ὑππόθι, ἦοι, ἔωσιν, ἐθέλησι, διδασκόμεναι.*
2. Write the Homeric terminations of the gen. sing. and dat. pl. of 1st and 2nd declensions.
3. Parse, giving chief parts:—*λεξιάσθων, μεδοίατο, ἔαται.*
4. Scan the last three lines.
5. What theories are held about the authorship of the Iliad? What discrepancies have been noted in it? State briefly the reasons for supposing it was not originally written.
6. What is the Greek for:—All day long—in this manner—to speak well of a person—three times a year—as quickly as possible—to exact a fee from pupils.
7. Translate into Greek:—The city was fortified in the reign of Cyrus, and taken three years afterwards by the Persians. Socrates seemed to me to be worthy of honour rather than of death at the hands of the state. Alcibiades was able to conquer his improper designs as long as he associated with Socrates, but he afterwards neglected himself.

III.

(Additional for Candidates seeking a First or Second Class.)

HERODOTUS: Book I., Secs. 95-130.

TIME: TWO HOURS.

A. Translate Herod. I., sec. 98, to *μάλιστα πη τὸ μέγαθος.*

1. Explain the syntax of the following phrases found in the extract:
 - (a) *ἵνα αὐτὸς ἔφραζε τῆς χώρας.*
 - (b) *οἰκοδομεῖ τείχεα μεγάλα τε καὶ καρτερὰ . . . ἕτερον ἑτέρῳ κύκλῳ ἐνεστεῶτα.*
 - (c) *τὸ μὲν κού τι καὶ τὸ χωρίον συμμαχέει, κολωνὸς ἔόν.*
2. *τὸ δὲ αὐτῶν μέγιστόν ἐστι τείχος κατὰ τὸν Ἀθηνέων κύκλον μάλιστα κη τὸ μέγαθος.* How long was the wall?
3. What is the force of the article in Herodotus?

B. Translate Herod. I., sec. 120, beginning at *εἶπαν οἱ Μάγοι.*

1. Write the Ionic forms of:—*δνομα, πότε, ἀφίκετο, ἑαυτῶν, πολὺς, ἑρόν, ὄρη.*

2. Give examples of the Ionic Imperfect; the Epic Aorist; the Ionic 3 pl. pluperfect passive of π mute and κ mute verbs.

3. Decline with accents in the Ionic dialect:—(a) in the singular, εως, Ἀχιλλεύς. (b) In the plural, κόμη, ναῦς.

4. Accentuate, give the Attic equivalents, and parse the following verbal forms:—επαλλογητο, ειρετο, αρτεαται, περιεσπε, ανενειχθεις.

5. The account of Cýrus's death, as given by Herodotus, differs from that given by Xenophon.

6. A short sketch of Herodotus.

7. Translate and accentuate the following sentence:—*Νυν γαρ, εφη, εμε τινες εις δικας αγοουσιν, ουχ οτι αδικουνται υπ εμου, αλλ οτι νομιζουσιν ηδιον αν με αργυριον τελεσαι η πραγματα εχειν. Και ο Σωκρατης ειπε μοι, εφη, ω Κριτων, κυνας δε τρεφεις, ινα σοι τους λυκουσ απο των προβατων απερικωσι; Και μαλα, εφη, μαλλον γαρ μοι λυσιτελει τρεφειν η μη. Ουκ αν ουν Θρεψαις και ανδρα οστις εθελει τε και δυναιτο σου απερικειν τους επιχειρουντας αδικειν σε.*

THIRD AND FOURTH YEARS.

DEMOSTHENES: OLYNTHIACS. SOPHOCLES: ANTIGON

TIME: THREE HOURS.

I.

A. Translate Olynth. I., secs. 2, 3, 4, beginning Ὁ μὲν οὖν παρὸν καιρὸς, ὧ ἄνδρες Ἀθηναῖοι.

1. Account for use of oblique cases and infin. moods in the following extracts from the preceding passage:—*ὑμῖν ἐκείνων αὐτοῖς—οὐκ οἶδ' ὄντινα . . . τρόπον—δεινὸς ἄνθρωπος πράγμασι χρῆσθαι—πρὸς τὸ τὰ τοῦ πολέμου . . . πράττεσθαι πολλῷ προέχει.*

2. τὸ πρῶτον Ἀμφίπολιν λαβὼν, μετὰ ταῦτα Πύδνην, πάλιν Ποτίδαιαν, Μεθώνην αὐθις, εἶτα Θεσσαλίας ἐπέβη. Describe their situation and give the dates of the events. What caused Philip to interfere in Thessaly?

3. προπέποιται τῆς παραντίκα χάριτος τὰ τῆς πόλεως πράγματα.—Translate, parse the verb and account for case of χάριτος.

4. πολλὴν δὴ τὴν μετάστασιν καὶ μεγάλην δεικτέον τὴν μεταβολὴν, εἰσφέροντας, ἐξίοντας κ. τ. λ.—Translate. What is the force of the adjective preceding the article? Explain an unusual construction in the sentence.

5. Give some account of the Theoric fund.

II.

B. Translate Antig., vss. 1064-1080.

1. Illustrate the use of participles from this extract.
2. ἀνθ' ὧν ἔχεις μὲν τῶν ἄνω βαλῶν κάτω κ. τ. λ.—What governs τῶν ?
3. In what different ways may a purpose be expressed ?
4. What is the derivation of the name *Tragedy* ? What improvements in its mode of representation are ascribed to Sophocles ? What is a Trilog^y ? Describe the appearance of an actor on the stage.
5. A brief sketch of Sophocles.

C. Translate into Greek : (For *Passing*, D may be substituted.)

1. This year the King sent Ambassadors to the Thracians, who dwell beyond the Hellespont.
2. We must look how we may journey safely, and how we may get provisions.
3. He is so beautiful as to be admired by all.
4. I am not ashamed of having conferred many benefits upon him.
5. He is too wise not to know that.

III.

(Additional for Students seeking a First or Second Class.)

D. Translate the following extract from a work not prescribed to be read :—Ταῦτα γράψαντος ἐμοῦ τότε, καὶ τὸ τῇ πόλει συμφέρον, οὐ τὸ Φιλίπῳ ζητούντος, βραχὺ φροντίσαντες οἱ χρηστοὶ πρέσβεις οὗτοι καθήντο ἐν Μακεδονίᾳ τρεῖς ὅλους μῆνας ἕως ἤλθε Φίλιππος ἐκ Θράκης, πάντα καταστρεψάμενος τάκει, ἕξδν ἡμερῶν δέκα, μᾶλλον δὲ τριῶν ἢ τετάρτων, εἰς τὸν Ἑλλησποντον ἀφίχθαι, καὶ τὰ χωρία σῶσαι, λαβόντας τοὺς ὄρκους, πρὶν ἐκείνον ἐξελεῖν αὐτά· οὐ γὰρ ἂν ἤψατο αὐτῶν, παρόντων ἡμῶν, ἢ οὐκ ἂν ὠρκίζουεν αὐτόν· ὥστε τῆς εἰρήνης ἂν διημαρτήκει καὶ οὐκ ἂν ἀμώφερα εἶχε, καὶ τὴν εἰρήνην καὶ τὰ χωρία.

LATIN.

Examiner.....JOHN JOHNSON, M. A.

FIRST YEAR.

CICERO: FIRST PHILIPPIC. VIRGIL: ECGUES.

TIME: THREE HOURS.

A. Translate:

Illud magis vereor ne ignorans verum iter gloriae gloriosum putes plus te unum posse quam omnes et metui a civibus tuis quam diligi malis. Quod si ita putas, totam ignoras viam gloriae. Carum esse civem, bene de republica mereri, laudari, coli, diligi gloriosum est: metui vero et in odio esse invidiosum, detestabile, imbecillum, caducum. Quod videmus etiam in fabula illi ipsi qui.

Oderint, dum metuant,

dixerit, perniciosum fuisse. Utinam, Antoni, avum tuum meminisses, de quo tamen multa audisti ex me eaque saepissime. Putasne illum immortalitatem mereri voluisse ut propter armorum habendorum licentiam metueretur? Illa erat vita, illa secunda fortuna, libertate esse parem ceteris, principem dignitate. Itaque ut omittam res avi tui prosperas, acerbissimum diem supremum malum quam L. Cinnæ dominatum, a quo ille crudelissime est interfectus.

1. Quod videmus etiam in fabula illi ipsi qui, Oderint dum metuant, dixerit, perniciosum esse. Name the work quoted in this passage, and its author, and explain the reference.

2. Utinam, Antoni, avum tuum meminisses. What do you know about the grandfather of Antonius? How are wishes expressed?

3. Point out the different uses of the subjunctive mood in the extract.

4. When and where was this speech made? Describe Cicero's movements from the assassination of Cæsar up to the time of its delivery, giving his own reasons therefor.

B. Translate:

Ultima Cymaei venit iam carminis aetas;
Magnus ab integro saeculorum nascitur ordo.
Iam redit et Virgo, redeunt Saturnia regna;
Iam nova progenies caelo demittitur alto.
Tu modo nascenti puero, quo ferrea primum
Desinet ac toto surget gens aurea mundo,
Casta fave Lucina: tuus iam regnat Apollo.
Teque adeo decus hoc aevi, te Consule, inibit,
Pollio, et incipient magni procedere menses;
Te duce, si qua manent sceleris vestigia nostri,
Inrita perpetua solvent formidine terras.
Ille deum vitam accipiet divisque videbit
Permixtos heroas et ipse videbitur illis,
Pacatumque reget patriis virtutibus orbem.
At tibi prima, puer, nullo munuscula cultu
Errantis hederas passim cum bacchare tellus
Mixtaque ridenti colocasia fundet acantho.
Ipsae lacte domum referent distenta capellae
Ubera, nec magnos metuent armenta leones.
Ipsa tibi blandos fundent cunabula flores.
Occidet et serpens, et fallax herba veneni
Occidet; Assyrium volgo nascetur amomum.

1. a. Nascenti puero. Whom may Virgil have meant?

b. How is the date of this Eclogue fixed?

2. Write explanatory notes on the following lines :
 - a. Ultima Cymaei venit jam carminis aetas.
 - b. Ibo (sc. Gallus) et Chalcidico quae sunt condita versu
Carmina, pastoris Siculi modulabor avena.
3. Describe the situation of the places mentioned :
 - a. Nec tantum Phoebos gaudet Parnasia rupes,
Nec tantum Rhodope miratur et Ismarus Orphea.
 - b. Mantua, vae, miserae nini vicina Cremonae.
Why are those epithets used ?
4. Whom did Virgil imitate in the Eclogues ? When were they written ? Which of his contemporaries does he mention in them ? Tell what you know of any one of them. Write in classical Latin and in English, the day, month and year of Virgil's birth.
 5. a. Give the gender, and genitives singular and plural (if used), and mark the quantity of the increment in the genitive singular of: fontes, pignus, palmes, cinis, lex, pinus, segetes, ðs.
 - b. Parse fave, invidet, consevimus, concupisse.
6. Account for the cases of: caelo, puero, mundo, formidine, illis, acantho.
7. Scan the lines quoted in B. 3.

C. Translate into Latin: Three years afterwards Cæsar returned from Gaul to Rome, and remained there three months. Next day the enemy burst into the town, and having killed all the citizens and carried off the booty, burnt it. No animal is more faithful to man than the dog. I shall ask him for his opinion without any delay. The light of the sun is brighter than that of the moon.

(Additional for Candidates seeking a First or Second Class.)

CICERO: FOURTH ORATION AGAINST CATILINE.

TIME: TWO HOURS.

A. Translate:

Quæ quum ita sint, patres conscripti, pro imperio, pro exercitu, pro provincia, quam neglexi, pro triumpho ceterisque laudis insignibus, quæ sunt a me propter Urbis vestraeque salutis custodiam repudiata, pro clientelis hospitibusque provincialibus, quæ tamen urbanis opibus non minore labore tueor, quam comparo: pro his igitur omnibus rebus, pro meis in vos singularibus studiis proque hac, quam conspiciatis, ad conservandam rempublicam diligentia nihil aliud a vobis, nisi hujus temporis totiusque mei consulatus memoriam postulo: quæ dum erit vestris mentibus infixa, firmissimo me muro septum esse arbitrabor. Quod si meam spem vis improborum fefellerit atque superaverit, commendo vobis parvum meum filium; cui profecto satis erit præsidii non solum ad salutem, verum etiam ad dignitatem, si ejus, qui hæc omnia suo solius periculo conservavit, illum esse filium memineritis. Quapropter de summa salute vestra populi que Romani, patres conscripti, de vestis conjugibus ac liberis, de aris ac focis, de fanis ac templis, de totius Urbis tectis ac sedibus, de imperio, de libertate, de salute Italiae deque universa republica decernite diligenter, ut institueritis, ac fortiter. Habetis enim eum consulem, qui et parere vestris decretis non dubitet, et, ea, quæ statueritis, quoad vivet, defendere et per se ipsum præstare possit.

1. a. P. Lentulus suum nomen, inductus a vatribus, fatale ad perniciem rei publicæ fore putavit. This is more fully described in another speech.

b. Neque meam mentem non domum sæpe revocat exanimata uxor, et abjecta metu filia et parvulus filius... neque ille qui expectans hujus exitum diei stat in conspectu meo gener. Give their names. Distinguish the different parts of a Roman's name. How were daughters designated ?

c. At vero C. Cæsar intelligit Legem Semproniam esse de civibus Romanis constitutam. Two ways of dealing with the arrested conspirators were suggested in the Senate. How did the *Lex Sempronia* support Caesar's proposal? How did Cicero try to show that the law did not apply?

d. Pro provincia, quam neglexi. What fact does he refer to. Name some of the Roman Provinces, and tell how they were governed.

e. Suo solius periculo. What is the construction of *solius*?

2. How were the last seven days of a February of twenty-nine days denoted?

3. Write in Roman capitals, 10,659. What is the Latin for: $\frac{5}{8}$, $\frac{2}{7}$, 2878th?

4. What nouns of the second declension and of the fourth are feminine?

5. Give two (or more) meanings of each of the following words, and mark quantities: *cadis*, *nectare*, *lutum*, *condita*, *salis*, *solum*, *es*, *liberos*, *sine*, *sero*, *pedes*, *satis*, *labor*, *victu*, *veniam*, *populus*.

6. a. What adjectives of one termination form the ablative in *i* only?

b. What adjectives lack the comparative degree only?

7. Form simple sentences to show the cases governed by: *opus est*, *consulo*, *utilis*, *caveo*, *celo*, *altior*, *aspergo*, *accuso*.

8. Arrange these sentences as Hexameters:

a. Saturnus primus ab Olympo aethereo venit.

b. Tum Aeneas dictis amicis regem adfatur.

SECOND YEAR.

CICERO: PRO. MILONE. HORACE: ODES, BOOK I.

TIME: THREE HOURS.

A. Translate: *Nec vero me, iudices, Clodianum crimen movet: nec tam sum demens tamque vestri sensus ignarus atque expertus, ut nesciam quid de morte Clodii sentiatis. De qua, si jam nollem ita diluere crimen, ut dilui, tamen impune Miloni palam clamare atque mentiri gloriose liceret: occidi, occidi, non Sp. Maelium, qui annonam levanda jacturisque rei familiaris quia nimis amplecti plebem putabatur, in suspicionem incidit regni appetendi, non Ti. Gracchum, qui collegæ magistratum per seditionem abrogavit, quorum interfectores impleverunt orbem terrarum nominis sui gloria, sed eum, (auderet enim dicere, quum patriam periculo suo liberasset,) cujus nefandum adulterium in pulvinaribus sanctissimis nobilissimæ feminae comprehenderunt; eum, cujus supplicio senatus sollennes religiones expiandas sæpe censuit; eum, quem cum sorore germana nefarium stuprum fecisse L. Lucullus juratus se quæstionibus habitis dixit comperisse; eum, qui civem, quem omnes gentes Urbis ac vitæ civium conservatorem judicabant, servorum armis exterminavit; eum, qui regna dedit, ademit, orbem terrarum, quibuscum voluit, partitus est; eum, qui, plurimus cædibus in foro factis, singulari virtute et gloria civem domum vi et armis compulit.*

1. What events are referred to in the following:

a. Non Sp. Maelium qui... in suspicionem incidit regni appetendi.

b. Non Ti. Gracchum qui collegæ magistratum per seditionem abrogavit.

c. Eum qui regna dedit, ademit.

d. Eum qui... singulari virtute et gloria civem domum vi et armis compulit.

2. a. Give in English and Latin the day on which this speech was to have been made.

- b. Mention in order the subjects with which Cicero deals.
 c. Describe the court and the method of procedure at the trial, pointing out what was unusual.

B. Translate :

Tu ne quaesieris, scire nefas, quem mihi, quem tibi
 Finem di dederint, Lenconœ, nec Babylonios
 Tentaris numeros. Ut melius quidquid erit patî,
 Seu plures hiemes seu tribuit Juppiter ultimam,
 Quae nunc oppositis debilitat pumicibus mare
 Tyrrhenum. Sapias, vina liques, et spatio brevi
 Spem longam reseces. Dum loquimur fugerit invida
 Aetas : carpe diem quam minimum credula postero.

Parcus deorum cultor et infrequens
 Insanientis dum sapientiae
 Consultus erro, nunc retrorsum
 Vela dare atque iterare cursus
 Cogor relictos : namque Diespiter,
 Igni corusco nubila dividens
 Plerumque, per purum tonantes
 Egit equos volucremque currum,
 Quo bruta tellus et vaga flumina,
 Quo Styx et invisi horrida Taenari
 Sedes Atlanteusque finis
 Concutitur. Valet ima summis
 Mutare et insignem attenuat deus
 Obscura promens ; hinc apicem rapax
 Fortuna cum stridore acuto
 Sustulit, hic posuisse gaudet.

1. a. Tu ne quaesieris. Give the different forms of a prohibition.
 b. Valet ima summis mutare. In what case is *summis*? *Muto* admits of two constructions. Write this sentence in prose.
 c. Hinc apicem rapax Fortuna cum stridore acuto sustulit. To what is Horace supposed to refer by using *apicem*? What is the force of *sustulit*?
2. Write explanatory notes on :
 a. Scriberis Vario fortis et hostium
 Victor Maeonii carminis alite.
 b. Quid dedicatum poscit Apollinem
 Vates?
3. Name the wines with their epithets that are mentioned in the First Book of the Odes ; or, Quote what Horace writes of Macaenas.
4. Scan these lines, and give the rules for quantities of last line :
 a. Matrem non sine vano.
 b. Nec regna vini sortiêre talis.
 c. Stravere et altis urbibus ultimae.
5. Give the gender and the nom. and gen. sing. and plural (if used) of : cadis, pulvere, sedibus, jecur, ignes, viris, fidê, Semele.
 b. Note peculiarities of declension of : Tempe, Argos, Achillei, precibus, Orpheus.
 c. Parse, giving chief parts : sapias, liques, reseces, retusum, adurit, bacchante.
6. What changes are made in turning *oratio recta* into *oratio obliqua* ?
7. In conditional sentences, how do the primary and secondary tenses of the subjunctive differ in meaning ?
8. Show by a simple example the different ways in which a purpose may be expressed.

C. Translate into Latin:—Tiberius Sempronius Gracchus, descended from a very noble family, would not suffer Scipio Africanus, though an enemy, to be carried to prison. The latter, when he was praetor, subdued Gaul; in his first consulship he conquered Spain, and in his second, Sardinia. When he was impeached by the people on a capital charge, Sempronius swore that he was not deserving of death, and that if he were banished he would go into exile along with him. Upon this he was acquitted.

(Additional for Candidates seeking a First or Second Class.)

HORACE: ODES, BOOK III.

TIME: TWO HOURS.

A. Translate Ode V, vss. 1—24.

1. The fourth stanza may be translated in two ways according to the reading.

2. Caelo Tonantem credidimus Jovem
Regnare: praesens divus habebitur
Augustus—

What is the force of *credidimus* and *praesens divus*?

3. Milesne Crassi conjuge barbara
Turpis maritus vixit. Explain.

4. Anciliorum....oblitus. What is meant? What is peculiar in the form *anciliorum*?

B. Translate Ode XXIII.

1. How does Bentley translate the last stanza?

2. Parse: *regnanto, consenuit, mānet, relēget, placaris.*

3. Explain the references in the following verses:

a. Telegoni juga parricidae.

b. Urentes arenas

Litoris Assyrii viator.

c. Nec Laestrygonia Bacchus in amphora.

4. The situation and modern names of: Praeneste, Tibur, Tiber, Forentum, Castalia, Palinurus, Tanais.

5. Write notes on the syntax:

a. Abstineto

Dixit, irarum calidaeque rixae.

b. Uxor invicti Jovis esse nescis. This may be translated in two ways.

c. Et qua pauper aquae Daunus agrestium
Regnavit populorum.

6. Arrange this sentence as a Sapphic stanza: *Cuncta manus festinat, huc et illuc puellae pueris mixtae cursitant: flammae rotantes sordidum fumum vertice trepidant.*

7. What events in Horace's life are mentioned in the Third Book of the Odes?

THIRD AND FOURTH YEARS.

HORACE: SELECTED SATIRES. TACITUS: ANNALS, BOOK I.

TIME: THREE HOURS.

A. Translate:

Hoc ego commodius, quam tu, praeclare senator,
 Milibus atque aliis vivo. Quacunq; libido est,
 Incedo solus; percontor quanti olus ac far;
 Fallacem Circum vespertinumque pererro
 Saepe Forum; adsisto divinis: inde domum me
 Ad porri et ciceris refero laganique catinum.
 Coena ministratur pueris tribus: et lapis albus
 Pocula cum cyatho duo sustinet: adstat echinus
 Vilis, cum patera guttus, Campana supellex.
 Deinde eo dormitum, non sollicitus mihi quod cras
 Surgendum sit mane, obeundus Marsya, qui se
 Vultum ferre negat Noviorum posse minoris.
 Ad quartam jaceo: post hanc vagor, aut ego, lecto
 Aut scripto quod me tacitum juvet, unguor olivo,
 Non quo fraudatis immundus Natta lucernis.
 Ast ubi me fessum sol acrior ire lavatum
 Admonuit, fugio campum lusumque trigonem.
 Pransus non avide, quantum interpellat inani
 Ventre diem durare, domesticus otior. Hæc est
 Vita solutorum misera ambitione gravique.

1. a. Write the ablative singular of: olus, far, supellex.
- b. Write the nominative of: porri, lagani, lusum trigonem.
- c. Parse: collibuisset, metiretur, refertus, erepsemus.
2. a. Fallacem Circum vespertinumque pererro
 Saepe Forum. Describe their situation.
- b. Ad quartam jaceo. How was the day divided by the Romans?

B. Translate:

Nox per diversa inquires, cum barbari festis epulis, laeto cantu aut truci sonore subjecta vallium ac resultantes saltus complerent, apud Romanos invalidi ignes, interruptae voces, atque ipsi passim adjacerent vallo, oberrarent tentoriis, insomnes magis quam pervigiles. Ducemque terruit dira quies: nam Quintilium Varum sanguine oblitum et paludibus emersum, cernere et audire visus est velut vocantem, non tamen obsecutus et manum intendentis reppulisse. Coepa luce missae in latera legiones, metu an contumacia, locum deserere, capto prope campo humentia ultra. Neque tamen Arminius, quamquam libero incursu, statim prorupit. Sed ut haesere coeno fossisque impedimenta, turbati circum milites, incertus signorum ordo, utque tali in tempore sibi quisque properus et lentae adversum imperia aures, irrumpere Germanos jubet, clamitans, "En Varus et eodem iterum fato vincetae legiones!" Simul haec et cum delectis scindit agmen equisque maxime vulnera ingerit.

What is unusual in the syntax of the following sentences?

1. a. Hoc ego commodius quam tu praeclare senator, Milibus atque aliis vivo. b. Sol acrior ire lavatum Admonuit. c. Ne hostes quidem sepultura invident. d. Aggerebatur nihilo minus caespes; jamque pectori usque accreverat. e. Rufus. . . antiquam duramque militiam revocabat, vetus operis ac laboris. f. Caecina. . . circumveniebatur, ni prima legio sese opposuisset.

2. a. Obeundus Marsya, qui se

Voltum ferre negat Noviorum posse minoris.

In what case is Marsya? What is referred to in these lines?

b. Legata non ultra civilem modum, nisi quod populo et plebi quadringenties tricies quinquies, praetoriarum cohortium militibus singula nummum milia . . . dedit. Translate and express the sums in English money in round numbers.

3. Turn into *oratio obliqua*: Blæsus increpabat singulos, clamitans: "mea potius caede imbuite manus; levioire flagitio legatum interficietis quam ab imperatore desciscitis; ant incolmis fidem legionum retinebo, aut jugulatus paenitentiam accelerabo."

4. How were the Provinces divided under Augustus?

5. *a.* Show by examples how guttural mutes are modified in English, Latin and Greek.

b. The Latin perfect is formed variously. Illustrate by examples.

c. What is the termination of the Locative? Where is it found in Greek and Latin?

C. Translate into Latin: But two of the Roman Generals were defeated; one was killed in battle; and the panic spread to the lines before Veii and even to Rome itself, where the rumour prevailed that the whole force of Etruria was on its march, that the camp before Veii was actually assailed by the enemy, and that his victorious bands might be expected at any moment to advance to Rome. So great was the alarm that the matrons crowded to the temples to avert by prayers and sacrifices their country's peril, and the Senate resolved to appoint a dictator.

(Additional for a First or Second Class.)

D. Translate this extract from a work not prescribed to be read:

At Suetonius mira constantia medios inter hostes Londinium perrexit, cognomento quidem coloniae non insigne, sed copia negotiatorum et commeatuum celebre. ibi ambiguus, an illam sedem bello deligeret, circumspecta infrequentia militis, satisque magnis documentis temeritatem Petilii coercitam, unius oppidi damno servare universa statuit, neque fetu et lacrimis auxilium eius orantium flexus est, quin daret profectionis signum et comitantes in partem agminis acciperet: si quos imbellis sexus aut fessa aetas vel loci dulcedo attinuerat, ab hoste oppressi sunt. eadem clades municipio Verulamio fuit, quia barbari omissis castellis praesidiisque militarium, quod uberrimum spoliandi et defendentibus intutum, laeti praeda et aliorum segnes petebant. ad septuaginta milia civium et sociorum iis quae memoravi locis cecidisse constitit.—*Tac. Ann.*, xiv. 33.

I. What advantages did the *tribunicia potestas* confer on Augustus; or, Describe the constitution and powers of the Senate under the Republic and under Augustus.

MATHEMATICS.

Examiner..... C. MACDONALD, M. A.

FIRST YEAR.—GEOMETRY.

APRIL 18—10 A. M. TO 1 P. M.

1. If a straight line be divided into two equal and also into two unequal parts, prove—by the division of the line if you can—that the squares of the unequal parts are together double of the squares of half the line and of the part between the points of section.

2. In any triangle the squares of the sides opposite an acute angle is less than the squares of the sides containing it by twice a certain rectangle. Complete the enunciation of the proposition, and prove it in the case of an obtuse-angled triangle.

3. A line drawn from the end of diameter of a circle, not perpendicular to it, cuts the circle. (The line may be produced.)

4. Prove that if a secant and a tangent to a circle be drawn from the same point, the square of the tangent is equal to the rectangle contained by the secant and its external segment. (Take the case when the secant does not pass through the centre.)

5. Inscribe a square in a given circle, and shew it is the greatest inscribed rectangle.

6. Illustrate the processes in proportion, "Inversion," "Alternation," "Composition," "Division;" and explain the reason of "*ex aequali*."

7. If a straight line be drawn parallel to one side of a triangle cutting the other two, it cuts them proportionally: and conversely. (Draw only one diagram.)

8. If two triangles have one angle of the one equal to one angle of the other and the sides about these equal angles proportional, the triangles are equi-angular, &c.

9. Given a point within an angle; draw through it a line meeting the lines containing the angle and making with them the least possible triangle.

10. The construction of the diagram in Euc. II., 11th prop., is suggested by the solution of the Quadratic, $x^2 = a(a - x)$.

11. From P, a point without the circle whose centre is C, tangents PQ and PT are drawn, and QT and CP are joined, CP cutting the circle in S. Prove that S is the centre of the circle inscribed in the triangle PQT.

12. Find a point within a triangle at which the sides subtend equal angles.

FIRST YEAR.—ALGEBRA.

3 TO 5½ P. M.

1. Give the rule for finding the square of a polynomial, and apply it to find the square of $a + b + c + d$. Adapt your method to the case where c and d are negative.

2. What is the arithmetical advantage of rationalizing the denominator of a surd expression? Treat the example: $\frac{\sqrt{5}}{\sqrt{5} + \sqrt{2}}$.

3. Shew that a surd cannot be equal to the difference of a rational quantity and a surd. Also if, $a^2 + b^2 = 1$, prove

$$a + b\sqrt{-1} = (a - b\sqrt{-1})^{-1}.$$

4. Solve the equation $\frac{x+2}{x+1} - \frac{4-x}{2x} = \frac{7}{3}$, and the simultaneous equations, $x - 2y = 1$, and $x^2 + 4y^2 = 145$.

5. Solve the equation: $1 + \sqrt{1+x} - \sqrt{1+x} + \sqrt{1-x} = 0$.

6. Given $x^2 - mx - n = 0$. Find the equation whose roots are the halves of the roots of this equation: and also the other equation whose roots are the sum and the product of its roots.

7. Invent an affected quadratic for yourself, and solve it without completing the square. (Not to be solved by the method called *Inspection*.)

8. A farmer bought a flock of sheep for \$300, but lost 5 of them in a snowstorm. He now sold the remainder at \$1 a head more than he paid for them, gaining thus \$15 on the whole transaction. How many sheep did he buy?

9. Taking the usual notation, sum a Geom. Series to n terms. Deduce the limit of the sum when n is infinite and $r < 1$. Hence find the value of a circulating decimal .72.

10. The n th term of an Arith. series, whatever n be, is $\frac{1}{6}(3n - 1)$. Find the series and the sum of p terms.

11. The ratio $a^3 + b^3 : a^2 + b^2$ is, in all cases, greater than the ratio $a^2 + b^2 : a + b$.

12. If a, b, c , are quantities such that, when $\frac{b}{2}$ is taken from each, the remainders are in Geom. Progression, then a, b , and c are in Harmonic Progression.

SECOND YEAR.—GEOMETRY AND MENSURATION.

10 A. M. TO 1 P. M.

1. Similar triangles are to one another in the duplicate ratio of their homologous sides.

2. Express the substance of the foregoing proposition as a problem. Also, A is a given rectilinear figure, and X and Y are two given straight lines. Find another rectilinear figure, B , similar to A , such that $A : B :: X : Y$.

3. If a quadrilateral figure be inscriptible in a circle, the rectangle of the diagonals is equal to the sum of the rectangles of the opposite sides.

4. If two secants be drawn from a point to a circle, the rectangle of the one and its external segment is equal to the same of the other. Prove by Book VI.

5. Assuming the expression for the area of a circle, find a circle equal in area to the sum of two or more given circles.

6. The subnormal of a parabola is constant.

7. Show that the section of a cone parallel to the slant height gives the parabola.

8. The sides of a triangle are 8, 10 and 12 ft. respectively : find the area.

9. The radius of a circle is 17 ft., and the height of a segment of it 2 ft. Find the area of the sector of which the segment is part : given $\frac{8}{17} = \sin. 28^\circ 4' 5$.

10. Find the radius of the escribed circle in Quest. 8, touching the longest side : and show from your formula that it is greater than either of the other escribed circles.

11. A cylindrical vessel (radius of base r and height h) is full of water. A sphere (radius r) is then wholly immersed causing the water to overflow. On withdrawing the sphere, what is the height of the water in the cylinder ? Give an arithmetical illustration. Ans. $h_1 = h - \frac{4r^3}{3r^2}$.

SECOND YEAR.—TRIGONOMETRY AND ALGEBRA.

3 TO 5½ P. M.

1. Trace the changes in sign and magnitude of $\cos. \theta$ from 0 up to 2π , and show that, as the radius vector spins round, $\cos. \theta = \cos. (2n\pi \pm \theta)$.

2. Find the area of a circle by the division of the sector into infinitesimal triangles.

3. Prove that $\sin A : \sin B : \sin C :: a : b : c$. Show to what uses these relations can be applied, writing the logarithmic equations concerned.

4. From any one of the formulæ for (1) $\sin (A \pm B)$ and (2) $\cos (A \pm B)$ the other three can be deduced. Deduce either of (1) from either of (2).

5. Find $\tan(A + B)$, $\tan 2A$, $\cot(A + B)$, $\cot 2A$, from the fundamental formulae.

6. Given the diameter of the earth and the dip of the horizon observed from a mountain-top: to find the height of the mountain.

7. Find the radius, R , of the circle circumscribing a triangle, and prove $Rr = \frac{abc}{2(a + b + c)}$.

8. Given two sides and the included angle of a triangle; find the third side without finding the angles.

Ex.: $a = 14$, $b = 9\sqrt{3}$, $C = 150^\circ$: find c .

9. Write four terms of the expansion of $\frac{1}{\sqrt{a^2 - x^2}}$. Write also the $(r + 1)$ th term.

10. How are Involution and Evolution (in Arithmetic) facilitated by the use of logarithms? Prove what you say. Also if $\log x = b$ to base a^m , find $\log x^p$ to base a^n .

11. A young man, age 18, is at the age of 25 to come into a freehold property of the annual value of \$A. Find its present value, writing the logarithmic equation concerned.

SECOND YEAR—EXTRA.

APRIL 22, 3 TO 5½ P. M.

1. The combinations of n things, r together, are equal in number to their combinations, $n - r$ together. Also, if the coefficient of the $(p + 7)$ th term of the expansion of $(a + x)^{2n}$ be equal to that of the $(p + 1)$ th term, $p = n - 3$.

2. Twelve persons are to be seated round a table, their places being determined by lot. Show that the odds against A having B for his next neighbour are 9:2.

3. Resolve $\frac{3x^2 - 7x + 6}{x^2(x + 1)}$ into its partial fractions.

4. If $\tan x + \tan y = a$; $\cot x + \cot y = b$; and $x + y = c$: prove $\cot c = \frac{1}{a} - \frac{1}{b}$.

5. If the perpendiculars from the angles on the sides of a triangle inscribed in a circle (D the diameter), be produced to meet the circle, and α , β , γ , be the produced parts opposite A, B, C, respectively: prove $\alpha \cos A + \beta \cos B + \gamma \cos C = 3D \cos A \cos B \cos C$.

6. Show that $\log(x^2 + 1) - \log(x^2 - 1) = \frac{2}{x^2}$ nearly, if x be so large that its negative powers after the second may be neglected.

7. Prove from the expansion of $(e^x - 1)^n$ in two different ways, that $n^n - n(n - 1)^n \frac{n(n - 1)}{1 \cdot 2} (n - 2)^n = 1 \cdot 2 \cdot 3 \dots n$.

What are co-polar triangles in spherics? From the fundamental equation, $\cos A = \frac{\cos a - \cos b \cos c}{\sin b \sin c}$, obtain the equation

$$\cos a = \frac{\cos A + \cos B \cos C}{\sin B \sin C}.$$

PHYSICS.

Examiner.....J. G. MACGREGOR, D. Sc.

MATHEMATICAL PHYSICS.

TIME: THREE HOURS.

N. B.—No more than twelve questions to be answered. Those marked with an asterisk have the higher values.

1. Define uniform velocity, average velocity, acceleration. Prove that the average velocity of a uniformly accelerated particle during a certain time is $V \pm \frac{1}{2} at$, where V is the initial velocity, a the acceleration, and t the time.

2. Given the direction and magnitude of the initial and final velocities of a particle, find the change of velocity.

*3. The points A, B of a system are displaced. If Oa represents the displacement of A in magnitude and direction, and Ob that of B, then ab will represent the displacement of B with respect to A.

4. A particle is projected with a velocity V whose direction is inclined α° to the horizontal plane. To what height will it rise? How long before it returns to the level of its starting point?

*5. What is simple harmonic motion? Define amplitude, period, phase. The acceleration of a particle whose motion is simple harmonic is towards the middle point of its swing, and proportional to its displacement from that point.

*6. State and explain the three fundamental laws of dynamics. From one of them determine the absolute unit of force, that of mass having been chosen. Find the value of the weight of 10 lb. in terms of it.

7. If P and Q are two component forces, whose directions are inclined at the angle θ , the resultant force is equal to $\sqrt{P^2 + Q^2 + 2PQ \cos \theta}$.

8. When may a force be said to do work on a body? What forms of energy may a body gain by having work done upon it? Give illustrations.

*9. Two bodies are connected by an inextensible string. One moves on a smooth horizontal table, the other hangs over the edge. If the masses are m and n , find the acceleration.

10. Apply the Law of the Conservation of Energy to the determination of the "mechanical advantage" of any arrangement of pulleys.

*11. If no external forces act on a system of particles, the velocity of the centre of mass is constant. Prove and give illustrations.

*12. The kinetic energy of a system of two particles of masses A and B is equal to that of a mass equal to $(A + B)$ moving with the velocity of the centre of mass, together with that of the motion of the particles relative to the centre of mass.

*13. Show that the rotating power of a force is proportional to its moment.

*14. What is the theory of Capt. Kater's pendulum? How would you use it?

*15. Motion is communicated to a cylinder of 100 lbs. mass, moveable about a horizontal axis, by the weight of a body of 10 lbs. mass attached to a cord coiled on the cylinder. How far will this body descend in 10 seconds? (The radius of gyration of cylinder = $\frac{1}{2}$ (radius of cylinder)²).

16. Given two parallel forces whose directions intersect a given line, determine the magnitude of the resultant and the point in which its direction intersects the given line.

*17. Any number of forces acting on a body in one plane, may be resolved into a single force and a single couple.

*18. Show that component couples in inclined planes are to be compounded according to the parallelogram law.

*19. A uniform beam A B is in equilibrium with one end A on the inner surface of a hemispherical bowl and a point C resting on the edge. Find the inclination of the beam to the horizontal, friction being neglected.

EXPERIMENTAL PHYSICS.

TIME: THREE HOURS.

N. B.—No more than twelve questions to be answered. Those with an asterisk have the higher values.

1. Prove that the pressure at any point of the surface of a fluid in a static condition is normal to the surface.

*2. What becomes of the energy expended in blowing a soap-bubble? Account for the rise of certain liquids in capillary tubes of glass.

*3. Prove that, if p is the pressure of a gas, and d its density, and if it consists of particles whose velocity of mean square is V , $p = \frac{1}{3} d V^2$. Shew that this equation expresses Boyle's Law. Sketch the molecular theory of electrolysis.

4. If V is the volume of a certain mass of gas, P its pressure, and T its temperature reckoned from the absolute zero of the air thermometer, shew that $\frac{VP}{T}$ is constant.

*5. How did the caloric theory of heat account for the production of heat by the expenditure of work? Shew how Davy's experiment decided for the dynamical theory as against the caloric theory.

6. Sketch and account for the more important phenomena of glacier motion.

7. Describe some method of determining the specific heat or the latent heat of fusion of a given substance.

*8. Given two similar bars of different metals, how would you determine which has the greater thermal conductivity? Justify your method.

*9. How would you shew by experiment that good absorbers of radiant energy are good radiators? Sketch the "theory of exchanges."

*10. State the two laws of Thermodynamics. How does Thomson deduce a scale of absolute temperature from the second law?

11. What are lines of force? What form have they in the neighborhood of a single magnetic pole? Determine the direction of the resultant force at any point in the neighborhood of two equal and similar poles.

12. What properties of magnets may be accounted for on the supposition that they consist of polar particles?

*13. How would you compare the values of the moment of a magnet at different times?

*14. How would you determine the law of electrical attraction? What is the most convenient unit of electrical quantity? Find its dimensions.

*15. Prove that the rate of change of potential at any point in any direction is equal to the force with which unit quantity of electricity would be acted upon at that point and in that direction. How would you shew that the potential throughout the interior of a conductor in an electrostatic state is constant?

16. Describe the essential structure of the Leyden Jar. Sketch the theory of its action.

17. How would you charge a conductor by means of an electrophorus? Shew that the possibility of producing great quantities of electricity by means of this instrument does not involve a violation of the Law of the Conservation of Energy.

*18. Define specific inductive capacity. How would you measure it in the case of any given dielectric?

*19. Describe some electrometer. Justify its use for the measurement of differences of potential.

20. A current flows through a circuit of two metals, if their junctions are at different temperatures. No current flows if they are at the same temperature. Account for this difference. Enumerate the possible transformations of the energy of the electric current.

21. Describe methods of obtaining induced currents. What is the general law of the direction of such currents?

*22. Shew that the electromotive force of a galvanic cell may be determined if the chemical changes which occur in it during the passage of the current are known. Is this possibility inconsistent with the contact theory of the cell?

ACOUSTICS, OPTICS AND ASTRONOMY.

TIME: THREE HOURS.

N. B.—No more than twelve questions to be answered. Those with an asterisk have the higher values.

1. Shew how the displacement of a particle in an elastic medium may originate a wave. Shew that the velocity of propagation is equal to the product of the wave length into the number of oscillations per second made by each disturbed particle.

*2. Shew by the application of Huyghens' principle that if a wave passes from one medium to another, it is so refracted at the bounding surface that the ratio of the sines of the angles of incidence and refraction is equal to the ratio of the velocities in the first and second media respectively.

3. How would you prove by experiment that the pitch of a musical note depends upon the number of vibrations made by the sounding body per second? How determine the intervals between the notes of the Gamut?

4. Waves may differ geometrically in three respects. What are the three corresponding physical differences in musical notes and beams of light?

*5. Describe one method of analysing complex musical notes. How does such analysis enable us to determine the cause of the difference of quality in the notes produced by different instruments.

6. Account for beats.

7. Describe a method of measuring the velocity of light.

*8. A divergent pencil of rays is incident directly on a concave spherical mirror. Find the relation between the radius of the mirror and the distances of the conjugate foci from the mirror. As the luminous point moves from an infinite distance up to the mirror, find the successive positions of its geometrical focus.

9. Determine the character of the images formed by convex and concave lenses respectively, the luminous body being small and placed at different distances on the principal axes.

*10. Any ray passing through a lens in such a manner that its direction while within the lens passes through the centre of the lens will on its emergence have a direction parallel to its initial direction.

*11. Shew by a diagram the course of the rays of light in the astronomical telescope.

*12. Explain the appearance of the bottom of a uniformly deep pool to an eye placed above the surface of the water.

13. Describe the spectroscope. Sketch the principles of spectrum analysis. How would you employ this method to determine the constitution of a comet?

*14. "Cross" two Nicol's prisms. Put a plate of a doubly refracting crystal between them. Let a parallel beam of light pass through the three. If the crystal plate is rotated what changes may be observed in the colour and brightness of the emergent light? How does the wave theory account for these changes?

*15. Describe one method of determining the density of the earth.

16. Define zenith distance, altitude, azimuth, declination, right ascension, ecliptic, vernal equinox, winter solstice, obliquity of ecliptic. Illustrate your definitions by reference to diagrams.

*17. Shew that the latitude of a place is equal to the elevation of the pole there. Describe and account for the variations in the length of the day at a place whose latitude is $66^{\circ} 32\frac{1}{2}'$.

18. Why do the sidereal, the apparent solar and the mean solar days differ in length?

*19. How does the aberration of light bear upon the question of the relative motion of the sun and earth?

*20. Describe Foucault's pendulum experiments and account for them on the supposition that the earth rotates.

*21. State Kepler's Laws. Prove that the forces acting on the planets are directed towards the sun; and that for planets moving in circular orbits they would vary inversely as the squares of the distances of the planets from the sun.

ETHICS.

Examiner. VERY REV. PRINCIPAL ROSS, D. D.

APRIL 25, 1881.

1. Explain the methods which Mental Science employs in investigating mental phenomena.

2. Why are the principles of Mental, and especially of Ethical, Science so much more unsettled than those of the Physical Sciences?

3. Specify particularly the points on which Libertarians and Necessitarians agree, and the points on which they differ.

4. Show that *liberty* and *necessity* are compatible terms.

5. By what influences is the Will sometimes enslaved?

6. What was the Ethical Formula of the ancient Stoics? Explain its meaning.

7. State the Utilitarian theory of morals. Point out its defects.

8. Explain the influence which the publication of Hobbes' theory of morals exercised on the progress of Ethical Science.

9. What is the foundation of Virtue? What its standard?

10. On what points are nearly all Pantheists agreed?

11. Mention some monstrous absurdities which Pantheism involves.

12. Supernatural Revelation does not supersede the necessity of the study of Natural Religion.

POLITICAL ECONOMY.

Examiner.....VERY REV. PRINCIPAL ROSS, D. D.

1. Distinguish between Capital and Wealth, and between Price and Value.
2. Mention the conditions on which the largest amount of production depends.
3. What circumstances limit the division of labor ?
4. Is capital ever unproductive ? Assign reasons.
5. In what different ways may exchanges be effected ?
6. Explain how the purchase of cotton cloth, say from England, by a nation which has very little direct trade with the American Union, affects the industries of the Southern, Northern, and Western States, respectively.
7. Under what conditions would the issue of an inconvertible paper currency be perfectly safe ?
8. Specify the points on which Free Traders and Protectionists agree, and the points on which they differ.
9. State and explain the different kinds of consumption.
10. Luxurious consumption is injurious to the interests of the laboring classes.

LOGIC AND PSYCHOLOGY.

Examiner.....REV. WM. LYALL, LL.D.

TIME: THREE HOURS.

1. What view have we taken of mind and its phenomena? How may this view be vindicated as opposed to the older and more common view ?
2. What is meant by the Practical Processes of Mind? Give the philosophy of the generalizing process and distinguish it from classification simply.
3. How may Memory be shewn to be reducible to *knowledge*, and how may this view be turned to a practical account ?
4. To what single law may the laws of Association be reduced? What is the peculiarity in Imagination ?
5. Under what different divisions may Logic be regarded, and which of these forms the subject of our Course? Divide Pure Logic into its constituent parts.
6. What view of our concepts affords Definition and Division respectively, and what two kinds of reasoning proceed upon this distinction? Give the true theory of reasoning.
7. Give the rules of the extensive and intensive syllogism respectively: the *modus ponendi* and *modus tollendi* of the disjunctive and hypothetical syllogisms. What is the nature of the Dilemma or Hypothetico-Disjunctive? What are syllogisms in respect of their external form ?
8. How is A converted, and in what case may it be converted simply? How are E and I converted? What are the objects, respectively, of the 2nd and 3rd Figures of the syllogism ?
9. Give a scheme of the Fallacies.
10. Give the laws of Definition and Division, with the rules of Proportion.

METAPHYSICS AND ÆSTHETICS.

Examiner.....REV. WM. LYALL, LL.D.

TIME: THREE HOURS.

1. How far may the problem of "Being per se" be allowed to affect our beliefs, whether as respects matter or mind, our own existence, or the existence of the world around us?
2. What do you understand by the "Noumenon" of Plato, and how may Aristotle's doctrine of a soul in everything be shown to correspond with this? Show also how Aristotle's "Final Cause" corresponds with the archetypal Idea of Plato?
3. What was there in the "Supernatural Faith" of Philo and the doctrine of "Absorption" as held by Plotinus inconsistent with Philosophy?
4. How did Descartes approach the Problem?
5. In what form does the ontological problem survive in modern philosophy? How does it encounter the scientist of the present day, and demand a solution, or faith, from everyone as respects his own being and destiny? What fallacy of assumption is involved in Spinoza's account of substance?
6. How have the Emotions been dealt with in a professedly scientific view of our spiritual nature? Upon what different principles have they been classified, and how may they be classified?
7. Give some account of the elevated Emotions. Find the esthetic emotion among these.
8. State briefly the theories on the subject of "Beauty and Sublimity"; showing how Cousin's theory is in perfect accord with Alison's, apart from the intellectual conditions of the former.
9. How may the Arts be classified? What styles may be enumerated in Poetry and Painting respectively? Name some of the masters in the different schools of painting.
10. Give the Active Powers. What regulative principle may be recognized among these, apart from any review of conscience in the case? What is the place of Conscience and the Will among these States? For what purpose have the Desires and Volitions been brought under the general class of "Optative States." Can this view be justified?

RHETORIC.

Examiner.....REV. WM. LYALL, LL.D.

TIME: THREE HOURS.

1. In speaking, what are the three principal ends? What are the departments of the human mind corresponding?
2. Under what general divisions may Rhetoric be considered? Give the different kinds of composition.
3. What are the figures of Similitude?
4. Specify those of Contiguity, with examples.
5. Give the figures of Contrast, with examples.
6. What is considered under the number and order of words?
7. What is the first generalized element in Exposition? What is the procedure in respect to it in order to exposition?

8. What are the methods of expounding a general principle or proposition? Distinguish a principle or proposition from a general idea or notion.

9. Mention some of the generalities that are wanting in the characters of Science, serving, however, the ends of popular interest if not of scientific truth. How are these dealt with? What modifications are adopted in their exposition?

10. How may the kinds of Oratory be classified and severally characterized?

11. What is to be considered in Oratory in respect to the persons addressed? Give a notable example of inattention to this.

12. What are the means of Persuasion viewed as conviction? What, viewed as persuasion proper? What are the classes of feelings more particularly addressed, or had regard to, in the case of the latter? Explain the "argumentum ad hominem," "ad misericordiam," "ad verecundiam."

CHEMISTRY.

Examiner GEORGE LAWSON, PH.D., LL.D., F.I.C.

INORGANIC CHEMISTRY.

FOR UNDERGRADUATES IN ARTS, SECOND YEAR.

FOR UNDERGRADUATES IN SCIENCE, FIRST YEAR.

FINAL EXAMINATION.—APRIL, 1881.

1. Explain briefly the distinctive nature of an Acid, the distinction between hydracids and oxacids, and give examples. What is a Base? Explain fully and clearly the nature or chemical constitution of the class of compounds called Salts, and their relation to Acids.

2. Give an outline of Classification of the Metals based on their chemical affinities, or the compounds which they form; and state what relation subsists between the chemical characters of the metals, and their modes of occurrence in nature.

3. Calcium. In what form does it occur in nature? When limestone is burnt what change does it undergo; when water is applied to burnt lime what change? When lime is made into mortar what further change? What is the chemical difference between Calcium Chloride and the powder commonly called Chloride of Lime?

4. Describe the chemical changes that take place in the iron furnace during the reduction of the ore to pig iron. Upon what does the value of an iron ore depend?

5. Explain the mode of occurrence of Gold in nature, and the process of obtaining it at the Nova Scotia mines. State what substances are apt to be mistaken for gold, and how they may be readily known.

6. Describe Aluminium with special regard to its mineral compounds.

ORGANIC CHEMISTRY.

FOR UNDERGRADUATES IN SCIENCE, SECOND YEAR.

PRELIMINARY EXAMINATION.—DECEMBER, 1880.

1. Wherein does Organic Chemistry, so called, chiefly differ from Inorganic? On what principle or principles are organic compounds classified?

2. Describe the processes for Elementary Analysis: (1) Determination of C and H; (2) of N; (3) Calculations.

3. Compare (1) Monobasic Acids; (2) Compound Ethers, (3) Aldehydes, (4) Acetones, (5) Chlorides of Acid Radicals, (6) Amides, (7) Amines, (8) Phosphines, (9) Arsines, (10) Stibines.

4. Describe common Alcohol, with regard to its mode of formation, chemical properties, and its relations to Ether, Aldehyde, and Acetic Acid.

5. Give process for preparing Chloroform, and show what changes take place in the materials used, so as to yield Chloroform.

FINAL EXAMINATION.—APRIL, 1881.

1. Show the composition of an Amine or Compound Ammonia, and why Amines are classified into primary, secondary, tertiary.

2. What is known or believed respecting the chemical constitution of the Natural Alkaloids?

3. Explain briefly the nature of an Animal Fat, and the process of formation of soap. What is Glycerine? and what are Ethers of Glycerine?

4. Give an account of Citric, Tartaric, and Malic Acids.

5. Describe Glucose, its sources and general properties, action on polarised light, chemical constitution, and compare with it (as regards constitution and transformations) Saccharose, Starch, Cellulose. What is a Glucoside?

6. What are the so-called Aromatic Compounds, as distinguished by some general feature? Benzole,—action upon it of Cl and of Nitric Acid? Aniline?

SPECIAL EXTRA QUESTIONS FOR MEDICAL STUDENTS.

1. In examining Water to ascertain its suitability for household use, what are the chief impurities to be looked for? By what methods may their presence and proportions be determined. Give an example of a water sample that should be condemned as unfit for use, although containing only a small percentage of foreign matter; also an example of a water that contains a large amount of impurity and is yet not necessarily unwholesome.

2. What compounds does the element Arsenic form with oxygen, and under what circumstances do they respectively occur in solutions. Give (1) a process for separating Arsenic in solution from organic matter, (preparatory to testing); (2) methods of testing; (3) method of estimating amount present.

3. Describe briefly, with special reference to their chemical characters: (1) Chlorine; (2) Hydrochloric Acid; (3) Chloride of Lime; (4) Chloroform; (5) Chloral Hydrate. Give process for determining presence of Chloral in contents of a stomach, and amount.

4. What form of Sugar occurs in diabetic urine? Describe one or more methods of rapidly ascertaining its existence and the amount present.

5. What is known of the chemical constitution of the Natural Alkaloids, and to what group or groups of well-understood compounds may they be compared? Give a general process for testing for Strychnine in cases of poisoning.

SPECIAL EXTRA QUESTIONS FOR PHARMACEUTICAL
STUDENTS.

1. Estimate the percentage of Hydrocyanic Acid in Solution.
2. Test for H_2SO_4 in Acetic Acid, and estimate amount.
3. What is Iodine? In what substances is it soluble? How would you test the purity of Iodine? Give tests for Iodides.
4. In what way would you prepare pure Caustic Potash. What are its properties.
5. Compare Mercurous and Mercuric Chlorides. In what way would you test Calomel for traces of Corrosive Sublimate, and in what way could you readily remove the latter.
6. What is the cause of the appearance of a White Precipitate in Bismuth Solutions on addition of distilled water to the solution?

CHEMICAL LABORATORY.

FOR UNDERGRADUATES IN SCIENCE, SECOND YEAR.

APRIL 21, 1881.

1. Solution contains four bases. Give a clear and concise account of the method by which you would ascertain what the bases are, and that there are no others present. (Bases of *Ag*, *Au*, *Ba*, NH_4)
2. State briefly what work you have done in the Laboratory during the Session.

ZOOLOGY.

Examiner.....GEORGE LAWSON, PH.D., LL.D., F.I.C.

FOR UNDERGRADUATES IN SCIENCE.

FIRST PAPER.—DECEMBER, 1881.

1. Great divisions or "Sub-Kingdoms" of the Animal Kingdom.
2. Protozoa, define them. What is sarcode?
3. Gregarinidæ, define them. Describe the process of encystation.
4. Rhizopoda. Define the five orders.

SECOND PAPER.—APRIL 16, 1881.

1. Give a definition of the fourth Animal Sub-kingdom "Annulosa." Compare its two divisions Arthropoda ("Articulata"), and Anarthropoda, and give illustrative examples of each.
2. Point out the more important differences—anatomical and physiological—between the four great classes of Arthropoda, viz.: 1. Crustacea. 2. Arachnida. 3. Myriapoda. 4. Insecta.
3. Give an account of the general method of classification of Insecta.
4. Refer to their proper orders the specimens labelled A B C D.
5. Define the Mollusca Proper, and give brief characters for the following classes: 1. Lamellibranchiata. 2. Gasteropoda. 3. Pteropoda. 4. Cephalopoda.

GEOLOGY, PALÆONTOLOGY AND MINERALOGY.

Examiner.....REV. PROF. HONEYMAN D.C.L., F.S.A., &C.

PART I.—TIME: 2½ HOURS.

1. The Archæan formation—what is it?
2. Name typical localities and characteristic rocks.
3. What is the supposed life of the period—its zoological character and relations?
4. What are essential minerals in these rocks, and what accidental?

PART II.—TIME AS ABOVE.

1. The great Auriferous formation of Nova Scotia—what is its age?
2. What are its rocks?
3. What are its minerals?
4. How does gold occur, and with what minerals is it sometimes associated?
5. How is the relative age of rocks ascertained?
6. In the county of Halifax what formation is found associated with the auriferous formation, and what inference in reference to the age of the latter might be deduced from this association?
7. What are breaks in succession? Give an example in nature and fill up the break.
8. What are the strike and dip of rocks and how are they observed?
9. How is the thickness of a series of strata ascertained? Give the formula for finding the thickness of an inclined series.

PART III.—TIME AS ABOVE.

1. What Palæozoic formations occur between the Archæan and Upper Silurian?
2. Give typical localities and the characteristic fauna of each.
3. State particulars regarding the Trilobites and Graptolites, especially the range in time and space of particular forms.
4. Give the morphology of a Trilobite and of a Graptolite.
5. When did Cephalopoda appear, and what was the primitive genus?

GERMAN.

Examiner.....PROF. JAMES LIECHTI, M. A.

THIRD YEAR.—JUNIOR.

TIME: THREE HOURS.

Translate: I Schiller: "*Der Taucher.*"

Und da hing ich, und war's mir mit Grausen bewusst,
Von der menschlichen Hülfe so weit,
Unter Larven die einzige fühlende Brust,
Allein in der grässlichen Einsamkeit,
Tief unter dem Schall der menschlichen Rede,
Bei den Ungeheuern der traurigen Oede.
Und schauernd dacht ich's, da kroch's heran,
Regte hundert Gelenke zugleich,
Will schnappen nach mir; in des Schreckens Wahn
Lass ich los der Koralle umklammeren Zweig,
Gleich fasst mich der Strudel mit rasendem Toben;
Doch es war mir zum Heil, er riss mich nach oben.

II. Richter's "*Neujahrsnacht eines Unglücklichen.*" — Ein alter Mensch stand in der Neujahrsmitternacht am Fenster und schauete mit dem Blick einer langen Verzweiflung auf zum unbeweglichen, ewig blühenden Himmel und herab auf die stille, reine, weisse Erde, worauf jetzt Niemand so freuden- und schlaflos war als er. Denn sein Grab stand nahe an ihm; es war blos vom Schnee des Alters, nicht vom Grün der Jugend verdeckt, und er brachte aus dem ganzen reichen Leben nichts mit als Irrthümer, Sünden und Krankheit, einen verheerten Körper, eine verödete Seele, die Brust voll Gift und ein Alter voll Reue.

III. Goethe: "*Reineke Fuchs.*"—

Reineke hatte die Worte gehört, doch fürchtet' er klüglich,
Andere möchten noch neben dem Boten im Hinterhalt liegen.
Als er sich aber versichert, der Bär sei einzeln gekommen,
Ging er listig hinaus und sagte: "Werthester Oheim,
Seid willkommen! Verzeiht mir; ich habe Vesper gelesen
Darum liess ich euch warten. Ich dank' euch, dass ihr gekommen;
Denn es nutzt mir gewiss bei Hofe, so darf ich es hoffen.
Seid zu jeglicher Stunde, mein Oheim, willkommen! Indessen
Bleibt der Tadel für den, der euch die Reise befohlen;
Denn sie ist weit und beschwerlich. O Himmel, wie ihr erhitzt seid!
Eure Haare sind nass, und euer Odem beklommen.
Hatte der mächtige König sonst keinen Boten zu senden,
Als den edelsten Mann, den er am meisten erhöhet?"

IV. Schiller: "*Wallenstein's Absetzung.*"—Wallenstein wusste längst den ganzen Inhalt ihrer Sendung, als die Abgesandten des Kaisers ihm vor die Augen traten. Er hatte Zeit gehabt, sich zu sammeln, und sein Gesicht zeigte Heiterkeit, während dass Schmerz und Wuth in seinem Busen stürmten. Aber er hatte beschlossen zu gehorchen. Dieser Urtheilsspruch überraschte ihn ehe zu einem kühnen Schritte die Umstände reif und die Anstalten fertig waren. Seine weitläufigen Güter waren in Böhmen und Mähren zerstreut; durch Einziehung derselben konnte der Kaiser ihm den Nerven seiner Macht zerschneiden. Von der Zukunft erwartete er Genugthuung, und in dieser Hoffnung bestärkten ihn die Prophezeiungen eines italienischen Astrologen, der diesen ungebändigten Geist, gleich einem Knaben, am Gängelbände führte.

Translate into German: Shylock, the Jew, lived at Venice; he was an usurer, who had amassed an immense fortune by lending money at great interest to Christian merchants. The better men are the happier they are. There were no railroads sixty years ago. What is the author's name, whose work you are reading. There are two kinds of books: good

and bad ones. You are right, sir, he said, the money is not to be given to them. What o'clock is it? It wants a quarter to three. What day of the month is it? It is the 23rd of April, 1881 (letters).

Questions: I. Parse and explain the position of the following words: *herab, worauf, war*, (II); *traten, derselben, erwartete er*, (IV).

2. *Ich dank' euch, dass ihr gekommen.* (III). Point out peculiarity in the construction of this sentence. Find another similar clause in the same passage. Write in an elliptical form: *Wenn er kmg gewesen wäre.*

3. Decline, in both numbers: *diesen ungebändigten Geist; seine weitläufigen Güter; ihrer Sendung*, (IV); also, the personal pronouns, *ich, er, es, ihr, sie* (pl).

4. *Ewig blühenden Himmel.* If the inflection *en* be added to the word *ewig*, what is the grammatical change it undergoes? State the difference in the meaning between the two forms. Write a few other examples in illustration.

5. *dacht, lass, riss*, (I); *seid, verzeiht, darf*, (III); *studire, widersprechen, anvertrauen, hineingehen, frühstücken, vollbringen.* Write down the first p. sing. of the Imp., the Inf. (of the first seven) and the past part. of those verbs. Which verbs reject the syllable *ge* in the past part.

6. What word is used in comparing two *adjectives* with one another. Take for example: This physician is more fortunate than clever. Compare: *bald, viel, gern, nah.* Exemplify the two superlative forms; and give the equivalents of: something useful; nothing new; in the best manner; extremely; most humbly.

7. By what word is the pronoun *es* (expressing a thing) replaced in the *genitive*. Translate: I rejoice at it. The pronoun *they* is rendered differently in the sentences: Who are they? They are my friends. Explain the reason.

8. Show by example that the German *Passive* may be rendered by *sein* and by *werden*. Translate: What has become of your friend? He has become a doctor. It is getting late. It is not to be thought of.—What class of verbs can be used only in the form of *passive impersonal* verbs? Take for example: I am not allowed (erlaubt) to speak much.

9. *Als ich trat ein zur Hofthür, der Hund sich erhob. Ich kehrte ein im Hause eines Bauern, das lag in kleiner Entfernung vom Ufer.* Correct these sentences, giving rules of construction.

10. Write the *genitive singular* and the *nomitive plural* of: *der Monat, die Eisenbahn, das Mineral, der Edelmann, das Geld, die Frau, das Mädchen, die Kenntniss, das Herz, der Irrthum.*

11. In what case do you substitute the *past participle* of the auxil. by the *infinitive*? Write an example.

12. Mention the two classical periods of German literature, and describe the character of each. Which is the oldest written monument of the German language. What language was spoken between the seventh and eleventh centuries. Name the two songs, dating from the fourth century; what is their metrical form?

FOURTH YEAR.—SENIOR.

TIME: THREE HOURS.

Translate: I. Bürger's Ballade "Der wilde Jäger."

Erschrocken blickt der Graf umher ;
 Er stösst ins Horn, es tönet nicht ;
 Er ruft und hört sich selbst nicht mehr,
 Der Schwung der Peitsche sauset nicht ;
 Er spornt sein Ross in beide Seiten
 Und kann nicht vor= nicht rückwärts reiten.

Drauf wird es düster um ihn her,
 Und immer düstrer wie ein Grab.
 Dumpf rauscht es wie ein fernes Meer.
 Hoch über seinem Haupt herab
 Ruft furchtbar, mit Gewittergrimme,
 Dies Urthel eine Donnerstimme :

" Du Wüthrich, teuflischer Natur,
 Frech gegen Gott und Mensch und Thier
 Das Ach und Weh der Kreatur
 Und deine Missethat an ihr
 Hat laut dich vor Gericht gefodert,
 Wo hoch der Rache Fackel lodert

Fleuch, Unhold, fleuch, und werde jetzt
 Von nun an bis in Ewigkeit,
 Von Höll' und Teufel selbst gehetzt !
 Zum Schreck' der Fürsten jeder Zeit,
 Die, um verruchter Lust zu frohnen,
 Nicht Schöpfer noch Geschöpf verschonen ! "

II. Humboldt: "Das Kreuz des Südens."—Seit wir in die heisse Zone eingetreten waren konnten wir jede Nacht die Schönheit des südlichen Himmels nicht genugsam bewundern, welcher in dem Maass, als wir nach Süden vorrückten, neue Sternbilder unsern Augen entfaltete. Man hat ein wunderbar bekanntes Gefühl, wenn man bei der Annäherung gegen den Aequator und besonders, wenn man von der einen Hemisphäre in die andere übergeht, allmählich die Sterne niederer werden und zuletzt verschwinden sieht, welche man von seiner ersten Kindheit an kennt. Nichts erinnert einen Reisenden lebhafter an die unermessliche Entfernung seines Vaterlandes als der Anblick eines neuen Himmels.

III. Schiller: "Maria Stuart." I Act.

Barleigh.—Die Richter ! Wie, Mylady ? Sind es etwa
 Vom Pöbel aufgegriffene Verworfne,
 Schamlose Zungendrescher, denen Recht
 Und Wahrheit feil ist, die sich zum Organ
 Der Unterdrückung willig dinge lassen ?
 Sind's nicht die ersten Männer dieses Landes,
 Selbstständig gnug, um wahrhaft sein zu dürfen,
 Um über Fürstnfurcht und niedrige
 Bestechung weit erhaben sich zu sehn ?
 Sind's nicht dieselben, die ein edles Volk
 Frei und gerecht regieren, deren Namen
 Man nur zu nennen braucht, um jeden Zweifel,
 Und jeden Argwohn schleunig stumm zu machen ?
 An ihrer Spitze steht der Völkerhirte,
 Der fromme Primas von Canterbury,
 Der weise Talbot, der des Siegels wahret,
 Und Howard, der des Reiches Flotten führt.

Maria.—Gerecht sein, ist ein uralt Wort—drum ist
 Herkömmlich seit der Väter grauer Zeit,
 Dass vor Gericht kein Britte gegen den Schotten,
 Kein Schotte gegen jenen zeugen darf.
 Die Noth gab dieses seltsame Gesetz :
 Ein tiefer Sinn wohnt in den alten Bräuchen,
 Man muss sie ehren, Mylord—die Natur
 Warf diese beiden feur'gen Völkerschaften
 Auf dieses Brett im Ozean ; ungleich
 Vertheilte sie's und hieß sie darum kämpfen.
 Der Tweede schmales Bette trennt allein
 Die heft'gen Geister ; oft vermischte sich
 Das Blut der Kämpfenden in ihren Wellen.
 Die Hand am Schwerte, schauen sie sich drohend
 Von beiden Ufern an seit tausend Jahren.
 Kein Feind bedrängt Engelland, dem nicht
 Der Schotte sich zum Helfer zugesellte ;
 Kein Bürgerkrieg entzündet Schottlands Städte,
 Zu dem der Britte nicht den Zunder trag.
 Und nicht erlöschen wird der Hass, bis endlich
 Ein Parlament sie brüderlich vereint,
 Ein Scepter waltet durch die ganze Insel.

Translate into German: Tales from Shakspeare "*Taming of the Shrew.*"
 Now the stately Katherine entered, and Petruchio first addressed her
 with " Good morrow, Kate, for that is your name, I hear." Katherine,
 not liking this plain salutation, said disdainfully, " they call me Katherine
 who do speak to me." " You lie," replied the lover ; " for you are called
 plain Kate, and bonnie Kate, and sometimes Kate the Shrew ; but, Kate,
 you are the prettiest Kate in Christendom, and therefore, Kate, hearing
 your mildness praised in every town, I am come to woo you for my wife."

Questions. 1. Mention the *prefixes* by means of which *derivative*
 verbs are formed. Take for examples the primitive forms : *brauchen, gehen,*
bauen, kommen ; use a different prefix in each case, giving the various
 meanings it may impart to the verb. Which is the modern form of *ant*,
 as found in *Antwort*.

2. Write down the 2nd person singular, indicative present, the past
 tense, and the past participle, of the following verbs : *einbinden, entreissen,*
gewinnen, hinaufsehen, unterwerfen, vorbeireiten, vollziehen, ertragen, laufen
abschliessen, fechten, wohlthun. State the difference in the meaning of the
 following verbs, according as the accent is either placed on the prefix or
 on the verb : *durchlaufen, übersetzen, unterhalten, wiederholen.*

3. The active infinitive with *zu* is often used as a predicate in the
 sense of the Latin *Gerundive*. Take for example : Such a thing is not to
 be believed. Illustrate the use of the infinitive *with* and *without zu*.
 Translate : I am about to write. Reading fatigues (ermüden) the eyes.
 I heard them sing.

4. Give some adjectives governing the *dative*, and some requiring the
 genitive case. Translate : Nova Scotia is rich in all kinds of mines. This
 young man is desirous of knowledge. He is tired of reading. Which is
 the place of the *complement* of an adjective ? Take for example : He is a
 man greatly esteemed in his country.

5. Have *intransitive* verbs a *complete passive* voice ? Explain, and
 translate : There was much laughter. There has been much fighting
 among men. How do you render : I have been told.

6. How do you translate the *present participle* in the following senten-
 ces : He is a promising young man. A people fighting for their liberty.
 He is addicted to drinking. My time being short, I cannot do it. He
 left the city without paying his debts. I rejoice at his being able to go
 to Germany.

7. Illustrate with a few examples, the use of the *past participle* in German. Equivalents of: The boy came running. Empty your glass. No smoking (imper).

8. Explain the construction of the *subject* and the *verb* in the various clauses of the first passage in part II.

9. What is the leading feature in all of Schiller's dramas, and in which one is it most beautifully developed. Classify his dramatic works, and write a few notes on Schiller and his labor. Which are his finest ballads; when were they composed?

FRENCH.

Examiner.....PROF. JAMES LIECHTI, M.A.

THIRD YEAR—JUNIOR.

TIME: THREE HOURS.

Translate: I. Le Sage: "*Gil Blas*." J'acceptai la proposition du docteur. Il me mena chez lui sur-le-champ pour m'installer dans l'emploi qu'il me destinait; et cet emploi consistait à écrire le nom et la demeure des malades qui l'envoyaient chercher pendant qu'il était en ville. Il y avait pour cet effet au logis un registre dans lequel une vieille servante marquait les adresses; mais elle écrivait si mal qu'on ne pouvait le plus souvent déchiffrer son écriture. Il me chargea du soin de tenir ce livre, qu'on pouvait appeler un registre mortuaire, puisque les gens dont je prenais les noms mouraient presque tous. J'inscrivais, pour ainsi dire, les personnes qui voulaient partir pour l'autre monde, comme un commis, dans un bureau de voiture publique, écrit le nom de ceux qui retiennent des places.

II. Madame de Sévigné—Il faut que je vous conte une petite historiette qui est très-vraie et qui vous divertira. Le roi se mêle depuis peu de faire des vers. M. M. de Saint-Aignan et Dangeau lui apprennent comment il faut s'y prendre. Il fit l'autre jour un madrigal que lui-même ne trouva pas trop joli. Un matin il dit au maréchal de Grammont: "M. le Maréchal, lisez, je vous prie, ce petit madrigal, et voyez si vous en avez vu un aussi impertinent: parce qu'on sait que depuis peu j'aime les vers, on m'en apporte de toutes les façons." Le Maréchal, après avoir lu, dit au roi: "Sire, Votre Majesté juge divinement bien toutes les choses; il est vrai que voilà le plus sot et le plus ridicule madrigal que j'aie jamais lu."

III. Scribe: "*Les précepteurs*."—Ledru: (*parlant à la cantonade*) Non, je vous remercie, je n'ai point de malle ni de valise; je n'aime point à me charger en voyage.... (*Seul*) Allons, Ledru, de l'effronterie! j'ai fait de tout dans ma vie, je ferai bien le savant... D'ailleurs, j'ai les premières notions; je possède, je puis le dire, une certaine littérature d'antichambre, quand ce ne serait que les romans que je lisais autour du poêle, lorsque j'étais laquais; et puis n'ai-je pas été pendant quelques mois au service d'un professeur de l'Athénée et d'un journaliste? ça vous rompt bien un métier. Ne perdons point de temps, et récapitulons (*tenant un portefeuille et quelques papiers de la poche de son habit*): 1° Mon maître avait accepté de M. Roberville la place de gouverneur de ses enfants, quelques petits marmots qu'on mènera comme on voudra. 2° La table, le logement, et mille écus d'appointement; n'oublions point cela.

Translate into French: To speak a great deal and well, is the talent of the wit; to speak little and well is the character of the wise [man]; to speak a great deal and badly is the defect of the coxcomb; to speak little and badly, is the fault of the fool.—Elizabeth, Queen of England, was tall

and well made; but she had a masculine shape; she possessed many accomplishments, and was very learned.—The sciences, to the study of which the French devote themselves most, are: Mathematics and Physics. Do not waste your time, for life is made of it, and employ it well if you wish to be happy.

Questions: 1. Parse the following verbs, and write down their primitive tenses: (I.) *prenais, écrit*; (II.) *faut, trouva, aie*; (III.) *fait, serait, pardons*. Mention when and how the *regul.* verbs: *mener, appeler* and *essuyer* change their stem; write an example for each.

2. Distinguish between the words: *a* and *à*; *du* and *dû*; *des* and *dès*; *cru* and *crû*; *mur* and *mûr*; *sur* and *sûr*; *ou* and *où*; *tacher* and *tâcher*; and account for the circumflex accent in *pâtre, goût, âpre* and *âne*. Name the three persons of every verb, that require the circumf. accent.

3. Illustrate, giving rules, the agreement of the adjectives in the sentences: We read good books. His Majesty the Emperor of Germany is in his eighty sixth year. The Romans admired the beautiful blue eyes of the captive Germans (*Germains*). The man and woman are old.

4. Write the comparative and superlative degrees of: *bon, bien, mauvais, mal, peu, beaucoup*. Translate: The better the laws (are) the happier (is) the country. Illustrate the exceptional case in which "more than" is rendered by *plus de* instead of *plus que*.

5. What pronominal forms correspond with objects preceded by the preposits *à* and *de*? Take for examples: Have you answered (*répondre à*) the questions? I am answering them now. They are speaking of their work. They are speaking of it. When is the *objective* pronoun placed after the verb? example.

6. *Les gens dont je prenais les noms.* (I.) Account for the position of the word *noms*, and write an example showing that the noun, following *whose* in English, may also follow *dont* in French. Is *dont* ever interrogative? Translate: Whose painting is this? Whose voice do I hear?

7. *Lequel; quoi?; que?; qui est-ce que?; qu'est-ce qui?; ce que.* Write short sentences on these words.

8. Which verbs are used to form certain idiomatic tenses. Translate: Every man should do his duty (*devoir*). A distinguished statesman has just arrived. He ought to have been rewarded. I was going to write a letter.

9. By what forms do you render "it is" in French, when used: 1. to denote time; 2. speaking of phenomena; 3. with reference to a preceding remark. Write in another form: *Il faut que je vous conte une historiette.*

10. Mention, giving one example, the words which, in a negative sentence, reject the adverb *pas*. Write the equivalents of: How far is it? To be at home. To dine out. What a storm! How many persons? How old is he? He is twenty years old. Most people. The 22nd of April, 1881 (letters).

THIRD YEAR—ADVANCED.

TIME: THREE HOURS.

Translate: I. Voltaire "*Mort de Coligny.*"

Le héros malheureux, sans armes, sans défense,
Voyant qu'il faut périr, et périr sans vengeance,
Voulut mourir du moins comme il avait vécu,
Avec toute sa gloire et toute sa vertu.
Déjà des assassins la nombreuse cohorte,
Du salon qui l'enferme allait briser la porte;

Il leur ouvre lui-même, et se montre à leurs yeux,
Avec cet oeil serein, ce front majestueux,
Tel que, dans les combats, maître de son courage,
Tranquille, il arrêta ou pressait le carnage.

A cet air vénérable, à cet auguste aspect,
Les meurtriers surpris sont saisis de respect ;
Une force inconnue a suspendu leur rage.
"Compagnons," leur dit-il, "achevez votre ouvrage,
Et de mon sang glacé souillez ces cheveux blancs
Que le sort des combats respecta quarante ans.
Frappez, ne craignez rien : Coligny vous pardonne ;
Ma vie est peu de chose, et je vous l'abandonne ;
J'eusse aimé mieux la perdre en combattant pour vous."

II. Le Sage "*Gil Blas*."—Je débutai par un alguazil qui avait une pleurésie ; j'ordonnai qu'on le saignât sans miséricorde et qu'on ne lui plaignît point l'eau. J'entrai ensuite chez un pâtissier à qui la goutte faisait pousser de grands cris. Je ne ménageai pas plus son sang que celui de l'alguazil, et je ne lui défendis point la boisson. Je reçus douze réaux pour mes ordonnances ; ce qui me fit prendre tant de goût à la profession, que je ne demandai plus que plaie et bosse. En sortant de la maison du pâtissier, je rencontrai Fabrice, que je n'avais point vu depuis la mort du licencié Sédillo. Il me regarda pendant quelque temps avec surprise ; puis il se mit à rire de toute sa force, en se tenant les côtés. Ce n'était pas sans raison : j'avais un manteau qui traînait à terre, avec un pourpoint et un haut-de-chausses quatre fois plus longs et plus larges qu'il ne fallait.

III. Scribe "*Les précepteurs*."—*Ledru*.—Ne perdons point de temps et récapitulons (*tirant un portefeuille et quelques papiers de la poche de son habit*) : 1° Mon maître avait accepté de M. Roberville la place de gouverneur de ses enfants, quelques petits marmots qu'on mènera comme on voudra. 2° La table, le logement, et mille écus d'appointements ; n'oublions point cela. Mon maître tombe malade, écrit une seconde lettre pour se dégager ; c'est moi qui dois la mettre à la poste ; au lieu de cela, je la mets dans ma poche ; je demande mon compte, et j'arrive ici à sa place en qualité de gouverneur. Il me semble déjà que c'est assez hardi de conception ; et pour le reste, je suis sûr que je ne m'en tirerai pas plus mal que beaucoup d'autres. D'abord j'ai une excellente poitrine, et en fait de dissertation crier fort et longtemps, voilà tout ce qu'il faut.

Translate into French: Wealth is, like science, like strength and courage, an instrument, the use alone of which determines its virtue or its defects. The success of most things depends on (de) knowing how long it takes to succeed. To be fond of reading is to exchange hours of weariness, that one must have in his life, for delightful hours. Who can avoid the too much and the too little? Man must die—whoever he may be, whatever he may do, whatever wealth (richesses) he may possess, whatever may be his station, however learned and powerful he may be.

Questions: 1. Parse, and write the primitive tenses of: *ouvre*, *craignez* (I); *saignât*, *faisait*, *mit* (II); *voudra*, *dois*, *faut* (III).

2. Voyant qu'il faut *périr*. What form does this sentence assume if you substitute the subjunctive for the infinitive of *périr*. Write another example in illustration of the use of the Infinitive.

3. Explain the word *de* in the sentence *de grands cris* (II); when would you use *des* instead of *de*? Distinguish between: *Ce vieillard a des petits-enfants*; *son fils a de petits enfants*; *cette galerie est remplie des plus beaux tableaux*, and: *cette galerie est remplie de plus beaux tableaux*. Name those adjectives that do not admit of the preposition *de* before them.

4. Qu'il ne fallait (II). Account for the negation in this sentence. In what case may there be ellipsis of *pas* in a negative sentence? Write an example. When must the negative *ne* be omitted?

5. What difference is there between *plus* and *davantage*? Translate: The more one loves some one, the less he ought (doit) to flatter him. Alexander was powerful; Augustus was still more so. The better a man is, the less he believes others bad.

6. Illustrate by an example the position of the *reflective pronoun* in the imperative mood, affirmative and negative. Write in French: Let them go out. Recommend me to them.

7. *Whose* is expressed by *lequel* and corresponding forms, in a certain case; write an example. Translate: The person *in whose* house I have lived for more than 10 years, has just died. Tell me whose voice is that which we hear.

8. Write short examples on *qui que, quoi que, tout ce qui, qui est-ce que*? Show that *quel que* may be variable and invariable.

9. Ces livres que j'ai faits venir, les trouvez-vous amusant? Les enfants m'ont dit cela eu riant beaucoup. Ces dames se sont rencontrées, se sont parlées et se sont dites les choses les plus aimables. Que de pluie il a fait hier! Nous avons marché longtemps. Explain, giving rules, the agreement of those participles, correcting mistakes.

10. Mary Stuart was compelled to appear before the judges, whom Elizabeth had appointed (nommer). The lady whom I have heard sing, is English. The song that I heard sung, is the National Hymn (hymne) of England. What is the agreement of the *participles* in these sentences?

FOURTH YEAR.

TIME: THREE HOURS.

Traduisez: I. Racine: "*Iphigénie*." Acte III, Scène VI.

Iphigénie.—C'est mon père, seigneur, je vous le dis encore,
Mais un père que j'aime, un père que j'adore,
Qui me chérit lui-même, et dont, jusqu'à ce jour,
Je n'ai reçu que des marques d'amour.
Mon coeur, dans ce respect élevé dès l'enfance,
Ne peut que s'affliger de tout ce qui l'offense;
Et loin d'oser ici, par un prompt changement,
Approuver la fureur de votre emportement,
Loin que par mes discours je l'attise moi-même,
Croyez qu'il faut aimer autant que je vous aime
Pour avoir pu souffrir tous les noms odieux
Dont votre amour le vient d'outrager à mes yeux.
Et pourquoi voulez-vous qu'inhumain et barbare
Il ne gémisses pas du coup qu'on me prépare?
Quel père de son sang se plaint à se priver?
Pourquoi me perdrait-il s'il pouvait me sauver?
J'ai vu, n'en doutez point, ses larmes se répandre.
Faut-il le condamner avant que de l'entendre?
Hélas! de tant d'horreur son coeur déjà troublé
Doit-il de votre haine être encore accablé?

II. Thiers: "*Départ de Napoléon pour l'île d'Elbe*."—Durant ces cruelles épreuves, Napoléon immobile, silencieux, affectant le plus souvent le mépris, ne put cependant demeurer toujours insensible aux cris répétés de la haine publique, et une fois enfin il fondit en larmes. Il se remit promptement et tâcha de reprendre une hautaine impassibilité, sans pouvoir toutefois s'empêcher de sentir, à travers la bassesse de ces démonstrations, cette tardive mais infaillible justice des choses, qui serait odieuse à contempler, si on ne la considérait que dans les vils instruments qu'elle emploie, mais qui paraît bientôt, si on élève la vue jusqu'à elle, aussi profonde que terriblement rémunératrice. Il ne reste aux grands esprits qui l'ont provoquée par leurs fautes, qu'un honneur, une consolation, c'est de la reconnaître, de la comprendre, et de se résigner à ses arrêts.

III. Racine: "Iphigénie." Acte IV, Scène V.

Clytemnestre.—Est-ce donc être père? Ah! toute ma raison
Cède à la cruauté de cette trahison.
Un prêtre, environné d'une foule cruelle,
Portera sur ma fille une main criminelle,
Déchirera son sein, et, d'un oeil curieux,
Dans son coeur palpitant consultera les dieux!
Et moi, qui l'amenai triomphante, adorée,
Je m'en retournerai seule et désespérée!
Je verrai les chemins encor tout parfumés
Des fleurs dont sous ses pas on les avait semés!
Non, je ne l'aurai point amenée au supplice,
Ou vous ferez aux Grecs un double sacrifice.
Ni crainte ni respect ne m'en peut détacher:
De mes bras tout sanglants il faudra l'arracher.
Aussi barbare époux qu'impitoyable père,
Venez, si vous l'osez, la ravir à sa mère.
Et vous, rentrez, ma fille, et du moins à mes lois
Obéissez encor pour la dernière fois.

Traduisez en Français: I. *Chesterfield to his son.*—It is not only reasonable, but useful too, that your evenings should be devoted to amusement and pleasures; and therefore I not only allow, but recommend, that they should be employed at assemblies, and in the best companies; with this restriction only, that the consequences of the evening's diversions may not break in upon the morning's studies, by breakfastings, visits, and idle parties into the country.

II. I do not think I need speak to you of the great joy with which we hailed, my husband and I, the return to Paris of our legitimate king. You will doubt still less that we were delighted to hear of the important position you now occupy at the court of Louis XVIII. I do not deny, that we have committed the indiscretion to inform some of our friends of our being the relatives of a very influential man! You cannot imagine the effect which that news produced in our small town.

Questions: 1. Le pronom *le*, employé idiomatiquement, est tantôt invariable, tantôt variable. Expliquez-en l'emploi dans les phrases suivs. Are you the prisoners that have been brought from Germany? Yes we are. Are those gentlemen Nova Scotians? Yes, they are. You are pretty (f.) now; you will not be always so, but you may always be amiable. Are you members for Halifax? We are. Are you the members for this county? We are not.

2. Quand faut-il traduire *any one* par *quelqu'un*, et quand par *personne*? Indiquez la nuance entre les expressions: Y a-t-il rien de plus beau que ce tableau, et Y a-t-il quelque chose de plus beau, etc. *Personne* est des deux genres; écrivez deux exs.

3. *Whatever* (variable), se traduit par *quel que* et par *quelque*. Eclaircissez ces formes en donnant quelques exs. Traduisez: *Whatever* he may say the will is void. The Premier of England is about seventy years old. Montrez que *quelque*, dans le sens de *however* est toujours invariable.

4. Donnez la première personne du sing. du futur des verbes: *acquérir*, *courir*, *croire*, *croître*, *envoyer*, *mourir*, *pouvoir*, *savoir*, *valoir*, *venir*, *voir*. Expliquez par l'étymologie, les irrégularités du verbe *aller*.

5. *S'il parlait on l'écoutait avec attention*. Dans quel cas l'inversion du sujet peut-elle avoir lieu dans les phrases pareilles à celle-là. Mentionnez d'autres cas, et écrivez des exs. à l'appui.

6. Corrigez les phrases suivs., et dites pourquoi elles sont incorrectes: Tôt ou tard on regrette le temps perdu et de n'avoir pas mis à profit tous les instants de sa jeunesse. La charité chrétienne nous commande d'aimer et de prêter assistance à notre prochain. Si le bon sens n'est pas estimé ce qu'il vaut, est que personne ne croit en manquer. Je lui donne ce qu'il a besoin.

7. Expliquez l'accord des part. passés dans les phrases qui suivent. *The little gratitude you have shown him, gave him the greatest pleasure. I have allowed (laisser) them to come into my room. Les sujets qu'on leur a faits étudier. La version a été plus facile que je ne l'ai crue. Fame has slain many men; the tongue has slain many more.*

8. All were saved *except* the captain and two sailors. Dites ce que vous savez sur l'accord du part p. *excepté*, et nommez tous les autres mots de la même classe.

9. Etablissez la différence entre le part. présent et l'adjectif verbal, et citez des exemples. Nommez quelques verbes qui n'ont point d'adj. verbal. Qu'est-ce que le Gérondif? Traduisez: *He was laughing while looking at me.*

10. Ecrivez une courte notice sur Racine, et faites une analyse critique de sa tragédie "*Iphigénie*." Quelle espèce de vers les classiques français emploient-ils pour la tragédie et la comédie? Qu'y a-t-il à dire par rapport à la rime?

EXAMINATIONS FOR HONOURS IN MATHEMATICS AND PHYSICS.

MATHEMATICS.

Examiner.....C. MACDONALD, M. A.

I.

TRIGONOMETRY AND ANALYTICAL GEOMETRY.

APRIL 19, 10 A. M. TO 1 P. M.

1. From the top of a rock, h feet above the level of the lake, an eagle was observed soaring at elevation-angle α° , and the depression-angle of his reflexion was at the same time d° . Show that his height over the

lake was $\frac{h \sin(d+\alpha)}{\sin(d-\alpha)}$.

2. The multiplication of factors of the form $(\cos \alpha + \sqrt{-1} \sin \alpha) \dots$ yields a function of the same form as one of the simple factors.

3. The expression $\left\{ \cos(2r\pi + \vartheta) + \sqrt{-1} \sin(2r\pi + \vartheta) \right\}^{\frac{1}{n}}$ has n different values and no more. Find the values of $(-1)^{\frac{1}{2}}$.

4. Prove

$$\cos n\vartheta = \cos^n \vartheta \left(1 - \frac{n(n-1)}{1 \cdot 2} \tan^2 \vartheta + \frac{n \cdot (n-3)}{4} \tan^4 \vartheta - \dots \right)$$

and $\sin n\vartheta =$ a similar series.

5. If C be an angle of a triangle so small that the higher powers of γ , its circular measure, may be neglected after the square, prove

$$c = (a-b) \left(1 + \frac{ab\gamma^2}{2(a-b)^2} \right) \text{ nearly.}$$

6. Prove $\cos 2\vartheta + \frac{1}{3} \cos 6\vartheta + \frac{1}{5} \cos 10\vartheta + \dots = \frac{1}{2} \log(\cot \vartheta)$.

7. Resolve $\sin \theta$ into a product of quadratic factors, viz. :—

$$\theta \left(1 - \frac{\theta^2}{\pi}\right) \left(1 - \frac{\theta^2}{2^2 \pi^2}\right) \left(1 - \frac{\theta^2}{3^2 \pi^2}\right) \dots\dots$$

and prove $\frac{\pi^2}{6} = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \&c.$

8. If $\tan \theta = m \tan \phi$, prove

$$\theta = \phi + \frac{m-1}{m+1} \sin 2\phi + \frac{1}{2} \left(\frac{m-1}{m+1}\right)^2 \sin 4\phi + \&c.$$

9. Two places A and B in same latitude, l , have difference of longitude, $2l$. Find the advantage, in distance, of travelling from one to the other on a "great circle," rather than on the parallel of latitude.

10. If $f(x, y) = 0$ represent any locus, the change of the origin and turning round the axes does not affect the *degree* of the equation.

11. What kind of locus is represented by the equations

$$\begin{aligned} ax^2 + 2bxy + cy^2 &= 0, \text{ and} \\ ax^3 + bx^2y + cxy^2 + dy^3 &= 0. \end{aligned}$$

Determine the former completely.

12. Given $S = 0$ and $S_1 = 0$; equations of the second degree. Interpret $S - l S_1 = 0$. Suppose also the equations to represent circles, and $l = 1$; explain the equation prescribed.

II.

ANALYTICAL GEOMETRY AND DIFFERENTIAL CALCULUS.

APRIL 21, 10 A. M. TO 1 P. M.

1. If $u = 0, v = 0, w = 0$ be the equations to the sides of a triangle, interpret the equations—

$$lvw + mwu + nvw = 0$$

$$\text{and } lv + mu = 0, mw + nv = 0, lw + nu = 0.$$

Shew also that the lines joining the poles of the sides of a triangle, inscribed in a conic section, with the opposite angles pass through a point.

2. Find the equations to the tangent and normal to an ellipse, origin being the centre. From the latter deduce that the normal bisects the angle between the focal distances.

3. Indicate the steps by which the general equation of the second degree, $ax^2 + bxy + cy^2 + dx + ey + f = 0$, is reduced to the form

$$\frac{x^2}{A^2} \pm \frac{y^2}{B^2} = 1, \text{ when } b^2 - 4ac \text{ is not zero.}$$

4. Lines drawn from an external point touch an ellipse. (1.) If the sum of the tangents of the angles they make with the axis of X is constant, the locus of the point is an ellipse. (2.) If the product of these tangents is constant, the locus is an ellipse or hyperbola, according as the sign of this product is negative or positive.

5. Tangents to a parabola meet at T, touching the curve at P and Q. If TABC meet the curve in A and C and the chord PQ in B: then is TC divided harmonically.

6. Prove that $\sin^{-1} x = x + \frac{1}{2} \frac{x^3}{3} + \frac{1}{2} \frac{3x^5}{5} + \&c.$

7. Prove that if $u = f(x)$ be a maximum or a minimum, the first differential co-efficient that does not vanish must be of an *even* degree.

8. Find the greatest triangle (isosceles) that can be inscribed in an ellipse, vertex at the extremity of the major axis. Find also the cylinder of least surface that can be cut out of a given sphere.

9. Discuss the curve $y = \frac{x^3}{x^2 - a^2}$; (1) with reference to position in the different quadrants: (2) angle or angles at which it cuts the axis of X: (3) asymptotes: (4) points, if any, of flexure.

10. If $y = a \sin x + b \sin 2x$: then $\frac{d^4 y}{dx^4} + 5 \frac{d^2 y}{dx^2} + 4y = 0$.

III.

DIFFERENTIAL AND INTEGRAL CALCULUS.

APRIL 22, 10 A. M. TO 1 P. M.

1. A parabola has its axis vertical. Prove that the focal chord down which the time of descent is a minimum is inclined to the perpendicular at angle $\theta = \tan^{-1} \sqrt{2}$.

2. Two curves, $y = f(x)$ and $y = \phi(x)$, have a contact of the n th order. What are the analytical conditions? Apply your remarks to the "circle of curvature."

3. By the use of an elementary triangle, &c., prove the following relations in spirals, (according to the usual notation) viz. :-

$$p = \frac{r^2}{\sqrt{r^2 + \frac{dr^2}{d\phi^2}}}, \frac{ds}{d\phi} = \sqrt{r^2 + \frac{dr^2}{d\phi^2}}, \frac{ds}{dr} = \frac{r}{\sqrt{r^2 - p^2}}; \text{ rad. of Curv.} = r \frac{dr}{dp}.$$

4. Change the above formulæ into others where u is the variable instead of r , u being $\frac{1}{r}$.

5. Consider the equation to the equiangular spiral, $r = a^\phi$ shewing (1) that an angle between the radius vector and the tangent at the point to which it is drawn is constant: (2) that the radius of curvature is proportional to the radius vector: (3) that the locus of the intersections of the perpendicular on the tangent with the tangent in a similar spiral.

6. Find $\int \cos^m \theta \sin^m \theta$ and $\int x \sin^{-1} \frac{x}{a}$. What do you consider the widest general method in Integration? Integrate $\frac{du}{dx} = \sqrt{ax^2 + bx + c}$

7. Find the area of the curve $y = a \tan^{-1} \frac{x}{a}$ between the limits a and o . Find also the volume and centre of gravity of the solid (homogeneous) produced by the complete revolution of the quadrant of an ellipse round the semimajor-axis.

8. The attraction of a material line of indefinite length on a particle at distance, a , is $\alpha \frac{1}{a}$ if the law of force be the inverse square of the distance: and is independent of a if the law is that of the inverse distance.

9. The velocity at any point in a central orbit is independent of the path described.

10. Find the law of force tending to the pole under which a body would describe the spiral in Quest. 5; and prove that the velocity at any point is inversely proportional to the radius vector at that point.

PHYSICS.

Examiner J. G. MACGREGOR, D. SC.

TIME: THREE HOURS.

1. A point moves in a plane curve. Find expressions for the component velocities and accelerations at any instant in directions along and perpendicular to the radius vector drawn from a fixed point in the plane of the curve.
2. Prove that the path of a point which has two component simple harmonic motions of equal period and with directions at right angles to one another, is an ellipse. Investigate the special cases in which the phases of the component simple harmonic motions (a) are the same, (b) differ by one half period, (c) differ by one quarter period.
3. Determine the form into which a sphere is distorted by a simple shear.—The result of the superposition of two pure strains is not in general a pure strain.
4. Find the velocity with which a body would reach the earth after having fallen from an infinite distance.
5. Two bodies tied together are projected in a horizontal plane in which they are perfectly free to move, but must remain. Prove that the acceleration of their centre of inertia is zero.
6. Prove that for any natural force, there may be found a function whose differential coefficient in any direction is equal to the force in that direction. Could $X = ky$, $Y = kx$ represent a natural phenomenon?
7. The moment of the applied forces on a system about any axis is equal to their moment about a parallel axis through the centre of inertia, taken as if this axis were fixed, together with the moment of the forces on the whole mass supposed collected at the centre of inertia and moving with it about the original axis.
8. Show that a sphere thrown into space will rotate uniformly as thrown.
9. A body has a number of component rotations about parallel axes. Find the co-ordinates of the resultant axis.
10. Prove the continuity of the potential.
11. Apply Poisson's extension of La Place's equation to show that the electrical force very near a charged conductor is $2\pi\sigma$, (σ being the density of the charge).
12. Find the resultant attraction inside a cylinder.
13. Enunciate and prove Green's theorem. Prove that the surface integral of normal attraction is equal to 4π times the mass enclosed by the surface. Give this equation the form applicable to tubes of force.
14. If a charged conductor is wholly enclosed by another conductor, the induced charge on the latter is equal to the inducing charge on the former.
15. Show that if two waves, which are caused by disturbances such that the particles of the medium vibrate in simple harmonic motions at right angles to the common direction of the waves, which are of the same wave-length and amplitude, and which differ in phase by one half-period, interfere, they destroy one another.

THEORY OF ELECTRICITY
CHAPTER I
SECTION I
ARTICLE I

1. A charged body in a fluid medium has a tendency to move towards the surface of the fluid, and to remain there until it has reached a point where the repulsive force of the fluid is equal to the attractive force of the body.

2. It is proved that the force of a body in a fluid medium is proportional to the square of the distance from the surface of the fluid, and that the force is directed towards the surface of the fluid.

3. The force of a body in a fluid medium is also proportional to the density of the fluid, and to the volume of the body.

4. The force of a body in a fluid medium is also proportional to the square of the velocity of the fluid, and to the area of the surface of the body.

5. The force of a body in a fluid medium is also proportional to the square of the distance from the surface of the fluid, and to the volume of the body.

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