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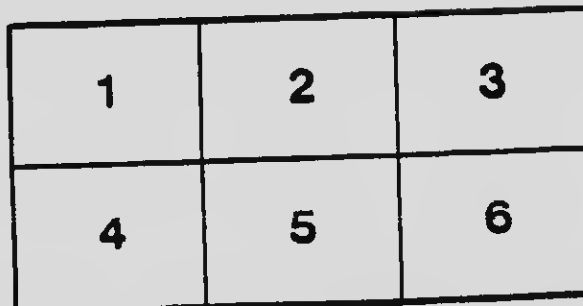
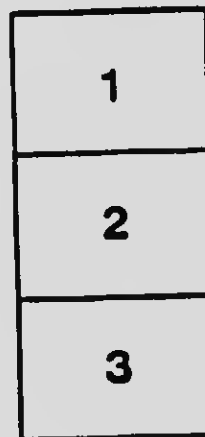
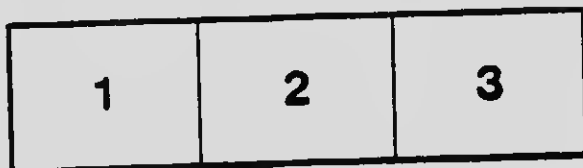
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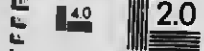
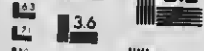
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Corporation of Quebec Land Surveyors.

Rules and regulations respecting the
admission to the Study and Prac-
tice of Land Surveying
in the province of Quebec

Programme of the subjects of examinations

Prepared by ARTHUR SMITH
Secretary-Treasurer



1913

Quebec

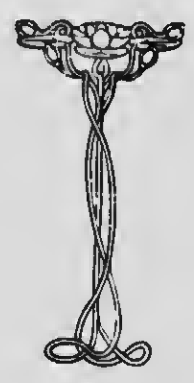
Corporation of Quebec Land Surveyors
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Corporation of Quebec Land Surveyors.

Rules and regulations respecting the admission to the Study and Prac- tice of Land Surveying

ACTS RESPECTING LAND SURVEYORS

(Extract from the Revised Statutes P. Q. 1909 and amendments)

5136. The annual general meetings of land surveyors both for the election of the members of the Board of Management, when necessary, and for the despatch of business, shall be held in the city of Quebec, or at any other place chosen by the Board of Management, on the third Wednesday of April in each year, or, if such Wednesday be a non-judicial day, on the next judicial day at the place and hour determined by the notice thereof given by the secretary-treasurer. The Board of Management shall hold a meeting the day before for the despatch of business.

Such meetings shall be presided over by the president of the Board, or, in his absence, by one of the vice-presidents, and in their absence, by the senior member of the Board present; and if there be no member of the Board present, then by the senior land surveyor present.

The election shall be held in the manner determined by the laws of the Corporation.

5139. The Board of Management shall meet at least once a year in the city of Quebec or elsewhere if it thinks proper, within the fifteen days preceding the annual meeting for the examination of candidates for admission to study, and practice the profession and for the despatch of business; and the Board of Management shall give to all students a notice of at least ten days of the date of such examination, by registered letter.

Admission to Study

5156. No candidate shall be admitted to the study of land surveying, unless he is sixteen years of age, and unless he has passed an examination, to the satisfaction of the Board of Management, upon the following subjects: universal geography, the histories of England, France and Canada, the history and the principles of French or English literature.

The candidate shall, moreover, have a sufficient knowledge of one of the official languages, and must be able correctly to translate English into French or French into English according as he shall choose French or English for his examination.

A candidate who has taken the degree of Bachelor of Rhetoric in a classical college in this Province, and has taken the number of marks required to obtain the degree of Bachelor of Letters, and who produces a satisfactory certificate to that effect, need not pass an examination on the subjects mentioned in this article.

5157. Every candidate for admission to study shall further pass an examination, to the satisfaction of the Board of Management, on arithmetic, on algebra as far as quadratic equations inclusive'y, on the theory and use of logarithms, on plane geometry, and on plane trigonometry.

5158. Students of the universities of this Province, or of colleges affiliated thereto, who have obtained the degree of Bachelor of Science, or of Arts, and have taken sixty per cent on the marks granted for mathematical subjects, and who produce a certificate to that effect, may be admitted as surveyor's clerks without passing the examination on the subjects prescribed by articles 5156 and 5157.

5159. The candidate for admission to study, who wishes to pass the preliminary examination, shall, at least one month before the day fixed for such examination, notify in writing, the secretary of the Corporation, of such intention, and at the same time forward him the sum of one dollar for the recording and filing of such notice.

5160. On presenting himself for examination, the candidate shall pay the sum of twenty dollars into the funds of the Corporation, as an examination fee.

5161. After the examination, if he is admitted as a student in land surveying by the Board of Management, the candidate shall pay a sum of four dollars to the secretary as his admission fee to the study of land surveying, and the Board of Management shall deliver to him a certificate of admission to the study of surveying, giving him the right to become indentured to a patron, for a four years or a three years course in pursuance of article 5165 or article 5169a, as the case may be.

5162. If the candidate fail in his examination, he may present

himself a second time, at a subsequent meeting, without being obliged to pay a further fee.

5162a. Pupils attending the preparatory class for the school of surveying of Laval University at Quebec and who are admitted to study surveying in such class, may become indentured to a patron for a three years or four years course as the case may be.

Admission to Practice

5163. To be admitted to the Practice of the profession of Land Surveyor in the Province it is necessary:

To be at least twenty one year of age:

To have undergone, in a satisfactory manner, an examination upon the subjects required for admission to study and upon the following sciences:

Geometry, rectilinear and spherical (theoretical and practical) trigonometry, theoretical and practical astronomy, linear and topographical drawing, levelling and all other questions relating to practical surveying, the use and theory of instruments, geology, mineralogy and the forest flora of Canada, the mode to be pursued in establishing boundary lines, the investigation of titles to property, and finally all fundamental questions of law connected with the measurement of lands.

Beginning with the examination to take place in 1912, students shall also pass an examination on the following subjects, namely: analytical geometry, descriptive geometry, differential calculus, physics, chemistry in its relation to minerals, the elements of mechanics, free hand drawing, and the drawing of plans.

5164. Every candidate for practice shall make, to the satisfaction of the Board of Management, a survey on the ground and produce a plan thereof with his field notes.

5165. Before presenting himself for examination, every candidate for the practice of the profession, who has not followed a course of surveying in an institution recognized as giving such course, must have regularly and faithfully served, during four consecutive years, as a student, under notarial indentures, with a land surveyor duly admitted to practice for the Province, and being a member of the Corporation entitled to practise; have received from such land surveyor a certificate of service during such period; and have had one years practice in the field in the Province either with his patron or with any other land surveyor who is also a member of the Corporation and entitled to practise.

The candidate shall give at least one month's notice to the secretary of his intention to present himself for examination, and with such notice forward the sum of one dollar.

5166. Every candidate for admission to practice, before undergoing examination, shall pay twenty dollars into the funds of the Corporation.

After passing his examination and before receiving his license, he must pay a further sum of twenty dollars, and also a sum of four dollars for the certificate of entry in the register of the Corporation.

If the candidate fails in his examination, he may present himself at any future examination, by paying, whenever he may so present himself, a fee of five dollars.

5167. The candidate for admission to practise, who has studied under notarial indentures, with a surveyor, for a period of four years, three years or one year, as the case may be, cannot present himself for examination unless a certified copy of such indentures has been transmitted to the secretary of the Board of Management at least thirty days previous to the date of the examination.

Whenever the secretary receives such copy of notarial indentures, together with the sum of two dollars as his fee, he shall acknowledge the receipt thereof and file it among his archives.

The same shall apply to a transfer of notarial indentures of a student in land surveying.

In both cases the deed shall not be considered as received, unless the fee has been paid.

5168. Every land surveyor, as soon as he is admitted and before being able to practise his profession, shall take and subscribe, before the president of the Board, or one of the vice-presidents, the oath of allegiance and the following oath of office: "I, A. B., solemnly swear that I will faithfully, without favor, affection or partiality, perform my duties as a land surveyor and member of the Corporation of Land Surveyors and Geometers of the Province of Quebec, according to law."

5169. Every person admitted as a land surveyor for the Dominion of Canada, or for any of the Provinces of the Dominion, other than that of Quebec, in which there is a board lawfully authorized for the admission of land surveyors, and who holds a diploma from such board, is obliged to serve under written indenture for twelve consecutive months only and to prove that he has had three months practice in the field in the Province of Quebec, after which he may undergo the examination prescribed by this section, on complying with all the other provisions of the same; provided always that such board shall grant the same privileges to land surveyors holding diplomas in the Province of Quebec.

5169a. Every student, under indentures, who has followed for at least three years the course given in the school of surveying at Quebec, and has there obtained the degree of Bachelor of Surveying, and who, during such course, has had at least nine months actual service on the ground, in the Province of Quebec, with a surveyor who is authorized to practise, may, after such course, present himself before the Board on Management, at its annual meeting, for his final examination, and may be admitted to practice if such examination is found satisfactory.

5170. Whosoever has followed a regular course of studies in all the branches of science required by law in order to be received as a land surveyor, in any university, college, polytechnic or other school, in this Province, where a complete course on theoretical and practical surveying is given, or who, being resident in the Province of Quebec, has followed the course of study in the Royal Military College of Kingston, and who has received from such university, college or school, after a regular examination, his diploma or degree as a civil engineer, land surveyor or bachelor of applied science, or who has been admitted as a member of the Canadian Society of Civil Engineers in virtue of section first of this chapter, shall be bound, after obtaining such degree or diploma, to serve under indentures for twelve months only, eight of which shall consist of active service in the field. At the expiration of said twelve months, such person has the right to present himself before the Board of Management and to undergo the examination required by law, and to be admitted to practise as a land surveyor in the Province, if his examination is considered satisfactory. Every person privileged to undergo only one examination before the Board of Management for admission to practise surveying, shall pay thirty dollars as the fee for such examination.

RULES RELATING TO THE EXAMINATIONS

1. The examination sittings shall begin at 9 A. M. and continue until 12 (noon); they shall begin again at 2 P. M. and continue until 5 P. M.

2. Candidates must present themselves punctually at the hours appointed for the commencement of the examinations, and no candidate will be allowed to enter the examination room after that time.

3. No candidate will be allowed to leave the room during a sitting; but as soon as he has finished his papers he may hand them to the presiding examiner and retire until the next sitting.

4. Candidates must not bring into the examination room any books, diagram, copy-books, papers or notes, and they are not allowed to use any books except those which are supplied by the Board of Examiners, such as Logarithmic tables and Astronomical Almanacs.

5. The questions on each subjects given to the candidates are either written, printed or dictated.

6. The questions given at the beginning of a sitting must be answered during the same sitting.

7. The candidates must prepare their answers during the time allowed for each subject, without using any notes or books, and without any assistance from the other candidates or outsiders.

8. The answers of the candidates must be written with ink, in a clean and legible manner on the sheets of paper delivered for that purpose by the Board, and bearing the seal of the Corporation; each sheet shall be numbered and written on one side only of the paper.

9. The papers of each candidate must contain his answers only; and bear no signature, name, sign, word nor mark of any kind, that may lead to the identification of the candidate. And all papers not strictly in conformity to this rule are to be considered null.

10. During the examination, a candidate shall never allow another candidate to have access, either directly or indirectly, to his answers. An infringement of this rule annuls the answers of both candidates.

11. A candidate shall never submit his answers personally or otherwise; nor give communication of these answers in any way whatever to a member of the Board, an examiner or any other person, previous to the answers being corrected by the committee of examiners. He shall never urge his admission by favour.

12. The board provides for whatever is necessary for the written examinations, but the candidates have to furnish their mathematical and surveying instruments.

13. When the time allowed for a sitting has expired, every candidate must cease working and all the papers containing his answer to the questions shall then be handed over to the presiding examiner in the manner indicated hereafter. Candidates who have not then completed their answers to any of the questions will be considered as not having answered these questions.

14. As soon as the candidate has completed his answers, or as soon as the time allowed has expired, the candidate writes in a legible manner his name and address on a sheet of paper prepared for that purpose under the directions of the board.

15. The candidate inserts the paper, bearing his address, in an envelope with which he has been provided by the secretary for that purpose, being careful to seal it. These envelopes are all of the same shape, and must bear no other marks than the printed endorsement.

16. The secretary provides each candidate with a large envelope all of the same shape, and having printed thereon the subject on which the candidate has prepared his answers. And these envelopes must bear no other marks whatever.

17. The result of a candidate's examination will not be communicated to him until it has been officially made public by the Board of Management at the end of the examinations. The candidate shall not make any inquiries in respect to such results of examinations.

18. To be admitted to practice, a candidate must obtain at least the minimum of points allowed for each subject, of the programme and moreover he must obtain two thirds of the total of points allowed on all the subjects.

However if a candidate for admission to practice obtains two thirds of the total of points allowed on all the subjects, and fails to obtain the minimum of points in, at most, two of the subjects of the programme; such candidate, at a subsequent examination, may be examined only on the two subjects in which he has failed. Nevertheless this privilege is not granted to a candidate who comes up for examination by virtue of article 20.

Moreover if a candidate coming up for a subsequent examination,

has to be examined on a single subject he must obtain at least two thirds of the points allotted to such subject. Or if he has to be examined on two subjects, he must keep two thirds of the total points allotted to those two subjects, besides the minimum of the points allotted to each of them.

19. No person other than the candidates and the members of the Board of Management shall be admitted into the examination room.

20. Any infringement by a candidate of the above rules, prevents him from being admitted to study or practice, as the case may be, during that session of the board, and he has to undergo his entire examination at another session.

21. Candidates are not allowed to smoke in the examination room.

22. When a candidate has paid all the fees he is required to pay; when he has fulfilled all the requirements of the act and of the by-laws to entitle him to practice as a Land Surveyor; and when he is admitted a member of the corporation, he takes the oath of allegiance and the oath of office by reading before the President or one of the Vice-presidents the formula inserted in the act.

23. When a candidate is admitted by the Board to the study or to the practice of the profession, he receives from the secretary a certificate of admission to study or a diploma of admission to practice as the case may be.

24. Candidates for admission to practice, previous to being admitted to the examination, shall produce all the documents required by Law and by the by-laws of the Board of Management, as follows: A certificate of admission to Study obtained after examination before the Board of Directors of the Corporation of Quebec Land Surveyors;— or, a diploma as "Arpenteur Stagiaire" or Bachelor in Land Surveying;— or, a diploma as a Civil Engineer, or Bachelor of applied sciences obtained from a Polytechnical School of the province of Québec, or from the Royal Military College of Kingston;— or, a diploma from the Canadian Society of Civil Engineers in virtue of Section first Chapter VI,— Title X of the Revised Statutes of the province of Quebec, 1909;— a certificate of baptism, or when no such certificate can be had, the best evidence of his age;— also a certificate of clerkship, of practice in the field, and of morals.

25. Candidates for Study shall produce a baptism certificate before being admitted to the examination.

26. Whenever it appears from the answers given by the candidates that they have not a sufficient knowledge of their own language, they shall be liable in such case to lose some marks.

**Fees to be paid by the candidates for admission to the Study
and Practice of Land Surveying**

FOR STUDY

1. For the notice given by a candidate coming up for examination.....\$ 1.00
2. Examination fee 20.00
3. For a certificate of admission to Study..... 4.00
4. For the registration of an act of indenture, or a transfer of indenture..... 2.00

FOR PRACTICE

1. For the notice given by a candidate coming up for examination.....\$ 1.00
2. Examination fees, payable :
 - By a candidate who has been under indentures during four years, with a surveyor..... 20.00
 - By a candidate holding a diploma as a land surveyor from another province or as a Dominion land surveyor. 20.00
 - By a candidate holding a diploma as "Arpenteur Stagiaire or Bachelor in Lang Surveying,—or as a Civil Engineer or Bachelor of applied sciences..... 30.00
 - By a candidate who has been previously examined for practice and who undergoes a subsequent examination..... 5.00
3. Fee to be paid by every candidate admitted to practice... 20.00
4. By every candidate admitted to practice for the registering of his diploma..... 4.00
5. For a standard of measures..... 11.00

Programme of the Subjects of Examinations

FOR ADMISSION TO STUDY

Dictation and Composition

(In French or English as the candidate may choose)

Translation

The candidate must be able to translate correctly English into French, or French into English according as he shall choose French or English for his examination.

Geography

Universal geography.
Geography of Canada.

Text books.—Précis de Géographie, Abbé Garneau.—J. B. Calkin's Geography.—Atlas des Frères des E. C. Cours supérieur.

History

History of Canada.

Text Books.—Histoire du Canada, Laverdière.—Le P. Ph. F. Bourgeois.—A brief history of Canada, J. B. Calkin.

History of France.

Text Books.—Histoire de France, Le Chanoine Godefroy.—Histoire Universelle.—Gagnol. (J. Unis).

History of England.

Text Books.—Outline of English History, Samuel P. Gardiner.—Gagnol.—Collier.

Literature

History and principles of French Literature.

Text Books:—Histoire de la littérature française, Blançœil, Larive et Fleury.—Les Frères des E. C.—P. Maistre.—J. Faivre.

History and principles of English literature.

Text Books:—Brooke.—Murray.—Burke.

Arithmetic and Logarithms

The four fundamental rules.
Properties of numbers.
Greatest common divisor and least common multiple.
Common and decimal fractions.
Operations on common and decimal fractions, and on recurring decimals.
Weights and measures.—Metric System.
Reduction of compound numbers.
Ratio and proportion.
Percentage—Discount—Annuities.
Simple and compound interest.
Assessment—Combination—Alligation.
Involution and Evolution.
Mensuration of surfaces.
Progressions and Logarithms.
Use of logarithmic tables.

Text-Books :—“Arithmétique des Frères des Ecoles Chrésiennes.”
—French and English edition).—Hamlin & Smith's Arithmetic.

Algebra

Addition.—Subtraction.—Multiplication and Division of Algebraic quantities.
Factoring and simplification of expressions.
Highest common divisor and lowest common multiple.
Fractions.
Equations of the first degree of one or more unknown quantities.
Inequalities of the first degree.
Radical quantities.
Quadratic equations and equations solved like quadratics.
Inequalities of the second degree.
Problems depending for their solution upon algebraic equations.

Text-Books :—Traité d'Algèbre élémentaire.—Falisse et Graindorge. — Elementary Algebra. — Hall & Knight. — Todhunter's Algebra.

Geometry

Plane Geometry.—The first four books of Legendre, by A. Cambier,—or
The first five books of Davie's Geometry,—or,
The first four books and the sixth of Euclid, by Todhunter or Hall & Stevens.

Plane Trigonometry

The trigonometric ratios.—Definition.—Measures of angles and arcs.—Signs of trigonometric ratios, variations of trigonometric functions.

Trigonometrical functions of an arc.

Relations between the trigonometrical functions of an arc.

Trigonometrical functions of an angle.

Relations between the trigonometrical functions of an angle.

Use of logarithmic tables.

Solution of right-angled triangles and demonstration of formulæ relating to right-angled triangles.

Solution of oblique-angled triangles.

Height and distances.—Area of a triangle.

Problems.

Text-Books :—“Trigonométrie des Frères”.—“Trigonométrie de A. Cambier”.—Elementary trigonometry, Hall & Knight.

FOR ADMISSION TO PRACTICE

Arithmetic

The programme on this subject is the same as for admission to Study.

Algebra

Part First.—The programme on the first part of Algebra is the same as for the preliminary examination.

Part Second. —

Theory of Limits.

Surds and imaginary quantities.

Continued fractions.

Indeterminate equations.

Permutations and combinations.

Binomial theorem.

Powers and roots of polynomials.

Recurring series,—summation of series.

Exponential function.

Theory of logarithms,—different systems.

Functions.

General theory of equations.

Determinants.

Problems.

Text-Books. — Falisse et Graindorge, Algèbre 2ième partie,—
Hall & Knight's Higher Algebra.

Geometry

Plane Geometry.—The first four books of Legendre by A. Cambier,—or

The first four and sixth books of Euclid, by Todhunter or Hall and Stevens.

Problems.

Solid Geometry.—Definitions, proofs and applications of the propositions.—Problems.

The Plane.—Solid angles.—Polyhedrons.—The sphere.

The three round bodies.—Cylinder.—Cone.—Sphere.—Surfaces and volumes.

Ellipse.—Parabola.—Hyperbola.—Surfaces and volumes.

Problems.

Text-Books.—“Géométrie de A. Cambier”.—Euclid's Elements of Geometry, Taylor.—Elements of Euclid, Todhunter.

Mensuration of Surfaces and Solids

Area of a Square, — Rectangle, — Triangles, — Quadrilaterals, — Circles, — Sectors, — Segments, — Regular polygons, — Irregular rectilinear figures, Plane circular ring, — Ellipse.

Area and solidity of a Cubo. — Rectangular parallelepiped. — Prism. — Right circular Cylinder. — Pyramid. — Right circular Cone. — Frustum of a pyramid and cone. — Sphere. — Zone. — Segment of a Sphere. Problems.

Text-Books. — A. Cambior. — Mensuration, Stevens. — Chambers practical Mathematics. — Géométrie de Baillaigé.

Descriptive Geometry

Representation of Points, Planes and Straight lines. — Different methods of projections. Projections of a Point. — Projections of a line. Projections of a straight line. Traces of a straight line. Representation of a plane. Traces of a plane. Problems.

The straight line. — Traces. Straight lines contained in a plane. Intersections. Problems.

Straight lines and Planes. — Intersections of planes. To find the point in which a given straight line pierces a given plane. Parallel planes. Straight lines and parallel planes. Straight lines and perpendicular planes. True length of straight lines. Problems.

Change of projecting planes. Method of rotation. Problems.

Angles. — Angles between straight lines and planes. Trihedral angles. Graphical solution of spherical triangles. Problems.

Text-Books: — Géométrie descriptive des Frères. — Church and Bartlett. Elements of Descriptive Geometry.

Analytical Geometry, (two dimensions)

Coordinates.

Homogeneous coordinates,

Transformation of the coordinates.

The straight line. — Problems.

The circle. — Problems.

Curves of the second degree.

General equation of the second degree.

The Eclipse. — Parabola and hyperbola. Problems.

Pole and Polar.

Conic sections. — Problems.

Polar coordinates. — Problems.

Construction of curves. — Problems.

Text-Books: — Géométrie Analytique de Sonnet, de Falisse, Smith's Conic Sections.

Plane Trigonometry

The trigonometric ratios. Definitions. Measures of angles, and arcs, signs of trigonometric ratios.

Relations between trigonometrical functions of the different arcs.

Solution of right-angled triangles and demonstration of formulae.

Solution of oblique-angled triangles.

Different expressions of the surface of triangles.

Natural trigonometrical functions.

Relations between the trigonometrical functions of an angle.

Formulae for the sum and difference of arcs.

Transformation of sums and differences of sines and cosines into products.

Trigonometrical equations.

Construction and use of logarithmic tables. Solution of triangles by logarithms.

Different expressions of the surface of a triangle with demonstration.

Radius of circum circle, and incircle of a triangle, radii of ex-circles of a triangle.

Heights and distances.

Area of quadrilaterals.

Maxima and minima.

Trigonometrical series.

Problems.

Text Books.—Trigonométrie des Frères.—Trigonométrie de A. Cambier.—Hall and Knight's Elementary trigonometry.

Spherical Trigonometry

Right-angled triangles.—Formulae relating to right-angled spherical triangles.—Napier's rules.—The quadrantal triangle.—Problems.

Oblique and isocles triangles.—The fundamental formula.—

Relations between the trigonometrical functions of the three sides and the three angles of any spherical triangle.—Napier's analogies.

—Solution of the spherical triangle in the six different cases.—Ambiguous case — Problems.

Applications.—To reduce an angle to the horizon; to find the inclination of two adjacent faces of a regular polyhedron; to find the distance between two points on the surface of the earth.

Area of a spherical triangle. Radii of the circum circle and incircle of a triangle. Solidity of polyhedrons.

Text Books:—Trigonométrie de A. Cambier.—Chauvenet's Plane and Spherical trigonometry.—Todhunter and Leathem's Spherical trigonometry.

Astronomy

The celestial sphere, spherical coordinates, Azimuth and altitude, declination and hour angle, declination and right ascension, celestial latitude and longitude.

Geographical coordinates.

Application of spherical trigonometry to the transformation of the coordinates and solution of the astronomical triangle.

Sidereal, solar and mean time, equation of time, astronomical, civil and standard time.

The Ephemeris or Nautical Almanac.

Interpolation.

Parallax, refraction, dip, semi-diameters.

Corrections to be made to the observed altitude of the sun, moon and stars.

To find the latitude of a place by the meridian altitude of the sun or a star, or from the altitude of a star on the prime vertical.

To find the time and azimuth by the altitude of the sun or a star.

To find the meridian line by an observation of a circumpolar star at its greatest elongation, by observation of the pole star at any time, use of the tables given in the Nautical Almanac.

Different methods of finding time, latitude, longitude and azimuth.

Use of the transit instrument and the zenith telescope.

Text Book :— Chauvenet's Spherical and Practical Astronomy, Green's Spherical and Practical astronomy, Galbraith & Houghton's Astronomy,— Franceour.

Differential Calculus

First principles.

Differentiation of functions of one variable.

Differentiation of functions of two or more variables

Differentiation of implicit functions.

Application of the above principles to the most usual functions.

Successive differentiation of functions.

Development of functions.— Taylor's and MacLaurin's theorem.

Analytical applications.—Maxima and minima.

Geometrical applications.—Tangents and normals to plane curves.

Asymptotes.—Envelopes.—Convexity and concavity.—Radius of curvature. — Evolute and Involute.—Osculating circle.—Singular points.—Curvature.

Text Books.—Sonnet, Calcul différentiel.—Williamson's Differential Calculus.

Land Surveying

Surveying with chain and with theodolite.

Establishment and prolongation of lines with and without obstacles, with and without instruments.

Measurement of regular and irregular fields,— of inaccessible lands.

Different methods of surveying.

Dividing up land.

Division of triangles, trapezoids, parallelograms, and of any irregular rectilineal figures.

Calculating the content of any piece of land.
Latitudes and Departures,— their use.
Subdividing and laying out town lots.
Levelling, measuring rods.
Field book.
Platting the survey,—making the plans and maps.
Drawing and drawing instruments.
Magnetic and astronomical bearings. — Magnetic declination,
variation of the magnetic needle and changes in the variation.
Measures of length. English, French and Metric.
Tachymetry—Stadia-rods.

Text-Books :—Gillespie's Land Surveying and Higher Surveying.
—Johnson's. Theory and Practice of Surveying.

Surveying instruments

Construction, adjustment and use of the principal surveying
instruments:— Surveyor's Compass, —Theodolite, Dumpy and Y
levels,—Aneroid barometer,—Sextant,—Tacheometer.

Text-Books :—Gillespie, Johnson.

Laws, Procès-Verbaux, Boundaries

Laws respecting the survey of land, Revised statutes of the pro-
vince of Quebec.—Cadastration.—Division of township, seigniories.
—Settling of boundaries and how to operate.—Examination of
deeds of ownership.—Expert surveys.— " Procès-verbaux ".—Pres-
cription.

Text-Books :—Laws respecting Land Surveyors.—Civil Code.—
Revised Statutes. P. Q., 1909, and amendements.

Inorganic Chemistry

Chemical changes.—Physical changes.
The Air.
Oxygen
Combining Weights.
Nitrogen.
Water.
Hydrogen.
Compounds of Nitrogen with Hydrogen and Oxygen.
Chlorine and its Compounds with Hydrogen and Oxygen.
Acids.—Bases.—Neutralisation.—Salts.
Carbon.
Compounds of Carbon with Hydrogen, Oxygen and with Nitrogen.
Atomic Theory.— Atomic Weights.— Molecular Weights.— Val-
ence.
Classification of the Elements.
The Chlorine family : Chlorine, Bromine, Iodine.—Fluorine.

The Sulphur family : Sulphur, Selenium, Tellurium.
The Nitrogen family : Nitrogen, Phosphorus, Arsenic and Antimony.—Boron and Silicon.
Base forming Elements.—General considerations.
The Potassium family : Potassium, Sodium, Strontium.
The Magnesium family : Magnesium, Zinc, Cadmium.
The Copper family : Copper, Mercury, Silver.
The Aluminium family :—
The Iron family : Iron, Cobalt, Nickel.
Manganese.—Chromium.—Uranium.—Bismuth.
Lead.—Tin.—Platinum.—Gold.

Text Books : *Traité de Chimie des Frères*.—*Reimsen's Elements of Chemistry*.

Physics

Preliminary definitions : Matter.—State and properties of bodies.
Elements of Mechanics.
Motion.—Force.—Energy.

Gravity : Direction and nature of gravity.—Laws of falling bodies.—Center of gravity.—Intensity of gravity.—The Pendulum
Determination of units.—Units of length, time and mass, and derived units.—Dimensions of derived units.—Instruments of precision.

Pneumatics : Atmospheric pressure and barometers.—Principle of Archimedes.—Mariotte's law.—Compressibility of gases.—Manometer.—Expansion of gases.—Diffusion and absorption.—Air pumps.—Elasticity of gases.—Compression and rarefaction of air.—Pumps.

Hydrostatics : Properties of liquids.—Equilibrium of liquids.—Applications of the above principles.—Density and specific gravity.—Levels. Artesian wells.—Hydraulic press.—Hydrometer.

Hydrodynamics : Compression of liquids.—Laws of capillarity.—Torricellian vacuum.—Pumps and Syphons.

Sound : Production, propagation and reflection of sound.—Wave motion.—Musical sound.—Determination of number of vibrations.—Vibrations of sounding bodies.—Vibration of strings.—Wind instruments.—Analysis and synthesis of sounds.—Timbre.—Perception of sounds.

Optics :—General phenomena of light.—Reflection of light, and laws.—Refraction and decomposition of light.—Optical instruments

Heat :—Temperature.—Expansion of solids, liquids and gases.—Density of gases.—Condition of change of state.—Melting points and solidification.—Vaporisation of liquids.—Ebullition and evaporation.—Liquefaction and solidification of gases and vapors.—

Hygrometers.—Specific heat of solids, liquids and gases.—Conduction in solids, conductivity of liquids and gases.—Expansion of heat.—Applications: Heating.—Ventilation.—Steam engine.

Magnetism :—Properties of a magnet.—Terrestrial magnetism.—The magnetic needle.—Declination and inclination or dip.—Distribution of magnetism.—Methods of magnetisation.

Electricity : Static Electricity.—General phenomena.—Development of electricity.—Measurement of electricity.—Coulomb's law. Distribution of electricity.—Surface density.—Electrical potential.—Electrostatic induction.—Condensers of electricity.—Electrical Machines.—Effects produced by electrical machines and condensers.—Electroscopes.—Electrometers.

Dynamic Electricity :—Voltaic battery.—Electric conductivity.—Constant current batteries.—Different effects of constant current.—Physiological. Chemical. Mechanical. Physical effects of the electric current.—Terrestrial current.—Heat.—Electric lighting.—Electro-magnets.—Galvanometers.—Storage batteries.—Electric motors.—Telegraph.—Telephone.—Electrotyping, etc.

Elements of Meteorology.

Text Books :—Ganot, "Traité de Physique".—Lessons in elementary physics.—Stewart.—Jones.—Simard.

Botany

Histology :—Cells and cellular tissue of plants, transformation of cellular tissue.

Organography :—Roots and stems, ligneous stems, buds and ramification,—structure and conformation of the leaves, their arrangement on the stem and branches.—Inflorescence,—structure of the flower, fruit and seed.

Physiology :—Nutrition and growth of plants, absorption, circulation, assimilation and secretion.—Fertilization and germination.—General principles of classification.

Principal species of forest trees in Canada and especially in the province of Quebec.

Text Books :—Mgr Laflamme, Elements de Minéralogie, Géologie et Botanique.—Moyen, Cours élémentaire de botanique.—Penhallow.

Mineralogy

Physical properties of minerals.—Crystallography, structure of minerals.

Crystals, fundamental forms, secondary forms, compound crystals, measuring angles, cleavage, fracture, hardness, specific gravity, tenacity, fusibility.

Magnetic and organoleptic properties. — Optical properties: Luster, color, diaphaneity, refraction, polarization, phosphorescence.

Chemical properties of minerals.—Qualitative analysis with the blowpipe and with acids.

Classification.—Characters of the principal species of minerals in Canada and especially in the province of Quebec.

Mineral deposits, their use.

Text-Books.—Elements de minéralogie, géologie et botanique de Mgr Laflamme.—Dana's Manual of Mineralogy.

Geology

Physiographic Geology.—Astronomical conditions of the globe,—earth's general contour and surface, subdivisions,—systems in the reliefs of the land. Plains,—Mountains.—Oceans.

Lithological Geology.—Elements constituting rocks,—minerals constituting rocks,—kinds of rocks, — condition, structure and arrangement of rock masses.

Dynamical Geology.—Origin, disturbances and transformations of rocks.—origin of mountains,—principal agents which contributed to the formation and modification of rock beds: Life, atmosphere, water and oscillations of the earth's crust.

Historical Geology.—General divisions.—Epochs, Ages, Periods.

Text-Books.—Element de Minéralogie, Géologie et Botanique de Mgr Laflamme, Dawson, Handbook of Geology, Dana, Manual of Geology.

Topography and drawing of plans

Topography,—Sketches,—Lettering,—Free-hand drawing.

Practical Surveying

Every candidate for practice shall make, to the satisfaction of the Board of Management, a survey on the ground and produce a plan with his field notes.



