tion ; Permutations and Combinations ; Introduction to Binomial Theorem ; Simple and Quadratic Equations, with relations between Roots and Coefficients , Problems.

Arithmetic and Mensuration —To know the subject in theory and practice. To be able to solve problems with accuracy, neatness, and despatch To be familiar with rules for Mensuration of Surfaces and Solids.

Geometry.—Euclid Books I. to IV. (inclusive), Book VI., and definitions of Book V. Exercises

Elementary Mechanics.

Statics.—Equilibrium of Forces acting in one Plano ; Parallelogram of Forces, Parallel Forces, Moments, Couples, Centre of Gravity, Virtual Work, Machines, Friction, Experimental Verifications.

Dynamics.—Measurement of Velocities and of Accelerations ; Laws of Motion, Energy, Momentum. Uniform and Uniformly Accelerated Motion, Falling Bodies, Experimental Verifications.

Hydrostatics — Pressure of Fluids, Specific Gravities, Floating Bodies, Density of Gases as depending on Pressure and Temperature, Construction and use of the more simple Instruments and Machines.

Physical Science.

Chemistry.—Definition of Chemistry and of chemical action. Indestructibility of matter. Simple and compound substances. Laws of chemical nomenclature. Symbolic and graphic notations. Classification of elements into metals and non-metals, into positive and negative elements.

Theory of atoms and molecules. Empirical, molecular, and constitutional formulæ. Absolute, latent, and active atomicity. Classification according to atomicity. Atomic and molecular combination Graphic formulæ. Definition of simple and compound radicals. Chemical equations.

French and English systems of weights and measures. Their convertibility. Expansion of gases by heat. Reduction of gaseous volume to standard pressure and temperature. Calculation of the weight and volumes of gases. Calculation of chemical quantities by weight. The crith and its uses. Calculation of empirical formulæ from per centage composition.

The preparation and properties of hydrogen, oxygen, nitrogen, carbon chlorine, bromine, iodine, fluorine, sulphur, silicon, boron, phosphorus, and arsenic.

The allotropic modifications of oxygen, carbon, sulphur, boron, and phosphorus.

The preparation, properties, and composition of water, hydrogen, peroxide, the compounds of nitrogen with oxygen and with hydroxyl, ammonia and the ammonic salts, carbon monoxide, carbon dioxide, carbonic acid, the carbonaces, light carburetted hydrogen, acetylene, heavy carburetted hydrogen, hydrochloric acid, the oxides and oxyacids of chlorine, bromine, and iodine, hydrobromic, hydriolic, and hydrofluoric acids, the oxides and oxyacids of sulphur, hydrogen sulphide, hydrogen disulphide, carbon disulphide, silica, silicic acid, silicic hydride, boron trioxide, boric acid, ph sphuretted hydrogen, the oxides and oxyacids of phosphorus, arseniretted hydrogen, arsenious and arsenic acids, and the arsenic sulphides.

Manufacture of hydrochloric nitric and sulphuric acids. Composition and manufacture of bleaching powder. Theory of bleaching. Structure of flame. Suitability of water for domestic purposes. Causes of temporary and of permanent hardness of water. The atmosphere, its constitution ; effects of animal and vegetable life upon its constitution. Names and formulæ of some of the more important silicious minerals.

The chief properties of the following named metals ; their reduction from their ores ; and the preparation, properties, and composition of their more important compounds :—The monad metals, especially potassium, sodium, and silver ; the dyad metals, barium strontium, calcium, magnesium, zinc, cadmium, mercury, and copper; and gold, aluminium, lead, platinum, nickel, cobalt, iron, manganese, and chromium. Manufacture of soda-ash, glass, porcelain and earthenware.

Heat ·—General effect of heat upon the volumes of bodies. Experiments illustrative of the expansion of solids by heat. Coefficients of expansion, linear, superficial, and cubical. Illustrations of precautions which changes of volume by heat and cold render necessary in the arts. The gridiron pendulum. Construction and use of the mercurial thermometer. Centigrade and Fahrenheit scales and the conversion of the readings of either into those of the other. Dependence of the boiling point of water upon external pressure, and illustrations of this dependence. The temperature at which the maximum density of water occurs, and the effects of this in nature. Change of volume when water passes from the liquid to the solid state, and the effects of this in nature. Bursting of water-pipes in frosty weather. Other substances which expand on solidification. Experiments illustrating the expansion of gases. Principle and action of the fire-balloon. Principles of ventilation. The Sun's action in the generation of winds. Explanation of the Trade Winds. Constancy of the coefficient of expansion of gases. The small deviations from the general rule exhibited by carbonic and sulphurous acid gases, and the chemical and physical character of these gases. The

chemical and physical constitution of aqueous vapor and its diffusion through the atmosphere. Meaning of the term *saturated* as applied to air charged with vapour. The effect of expansion in chilling air, and the consequent condensation of the aqueous vapor diffused through the air. Application of this knowledge to the explanation of clouds and rain. Meaning of specific heat or capacity for heat. Description and use of the calorimeters of Lavoisier, Laplace, and Bunson. The facts covered by the term *latent heat.* The latent heat of water and of aqueous vapour expressed in the centigrade and Fahrenheit scales. Conduction and convection, and the distinction between them. The low power of conduction of organic substances. Effect of mechanical texture on the transmission of heat, and the function of the clothes in preserving the body from cold. Character and phenomena of combustion. Chemical actions which occur in the combustion of coal and of ordinary gas. Explanation of the manner in which a candle flame receives its supply of combustible matter. The cause of animal heat. Structure of an ordinary gas flame, and the cause of the difference between this flame and that of a Bunsen's burner. General phenomena of radiant heat. Reflection and refraction. Different powers possessed by different substances to radiate heat. Explanation of how it is that under certain circumstances the cooling of a vessel may be hastened by surrounding it with flannel. Reciprocity of radiation and absorption. Meaning of the term *diathermancy.* Manifestation of this property by different bodies.

II.—FOR GRADES A AND B.

When first class Grade C has been obtained, the candidate who desires to proceed to I. B, or I. A, may take options. There are three optional Departments, viz.:—

The Department of English Language and Literature, with History and Geography.

The Department of Mathematics.

The Department of Physical Science.*

* The Optional Department of Physical Science will not take effect till after July, 1880

DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE, WITH HISTORY AND GEOGRAPHY.

The English Language.

Composition.

History and Etymology of the English Language.

Rhetorical Forms.

Prosody.

BOOKS OF REFERENCE.—Earle's Philology of the English Tongue, Abbott and Seeley's English for English People, Bain's Composition and Rhetoric, Marsh's English Language and Literature, Lectures VI. to XI. inclusive.

English Literature.

1 History of English Literature from Chaucer to the end of the reign of James I

2 Specified works of standard authors to be prescribed from time to time by the Department.*

BOOKS OF REFERENCE.—Craik's History of the English Literature and Language, Marsh's English Language and Literature, Lectures VI. to XI. inclusive.

History.

Greece.—The Persian to the Peloponnesian War inclusive —Cox's History of Greece.

Rome —From the beginning of the second Punic War to the death of Augustus.—Mommsen's History of Rome.

England.—The Tudor and Stuart periods, as presented in Green's Short History of the English People, Macaulay's History of England, and Hallam's Constitutional History.

Canada.—Parkman's Old Regime in Canada.

Geography.

So much Ancient Geography as is necessary for the proper understanding of the portions of the Histories of Greece and Rome prescribed.

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* The following are prescribed for 1880:
CHAUCER —The Prologue to the Canterbury Tales. The Nonne Prestos Tale.
SHAKESPEARE.— Romeo and Juliet.
MILTON.—Areopagitica.
POPE.—The Essay on Man.
JOHNSON.—The Lives of Milton and Pope.
MATTHEW ARNOLD.— The Preface to Johnson's Chief Lives of the Poets.
N. B.—Candidates who take other departments will be required to show by passing an examination in Romeo and Juliet that they have read the play carefully and that they are in the habit of writing the English language correctly.
☞ No particular editions of these texts are prescribed, but the following good ones are mentioned in order to assist candidates:
Morris's edition of Chaucer's Prologue to the Canterbury Tales and the Nonne Prestes Tale in the Clarendo Press Series.
Hunter's Romeo and Juliet.
Arber's edition of the Areopagitica.
The edition of the Essay on Man in the Clarendon Press series.
Matthew Arnold's Johnson's Chief Lives of the Poets.