SUPPLEMENT

TO THE

Ceylon Government Gazette

PART I.

No. 7,133 — FRIDAY, OCTOBER 8, 1920.

REGULATIONS FOR THE CAMBRIDGE JUNIOR AND SENIOR SCHOOL CERTIFICATE EXAMINATIONS, DECEMBER, 1921.

AN Examination will be held at Batticaloa, Colombo,* Galle, Jaffna, Kandy, Mount Lavinia†, and Panadure on December 12, 1921, and following days, for the purpose of awarding Junior and Senior School Certificates, under the conditions set forth below, to candidates who are presented for examination from schools accepted for this purpose.

2. In order to be accepted, a school must be inspected by the Ceylon Education Department, and the report of such inspection must be approved by the Syndicate as satisfactory.

3. Government and grant-in-aid schools will not be accepted unless they have been registered by the Department as secondary schools or elementary schools with secondary departments with courses of work leading up to the examination offered. Schools which are not Government or grant-in-aid schools will not be accepted, unless the Department is satisfied that their staff and equipment enables them to prepare classes for the examination offered.

4. Only those candidates will be admitted to the examination who are members of a class which is going through the course of work prescribed for it; and it will be expected that all the eligible members of such classes will be presented. If it is desired not to present any individual pupil, the reasons for this must be approved by the Inspector. A complete list of the pupils in the Junior or Senior Certificate Classes, giving the dates at which each pupil joined the class and the school, will be required. If any member of the class has attended another recognized school since January, 1919 (in the case of Juniors since January, 1920), dates of admission to and departure from such schools should also be given. Pupils who were born after December 14, 1907, will not be accepted for the Junior School Examination, nor those born after December 14, 1905, for the Senior School Examination.

5. A Junior School Certificate will be awarded to any candidate who (*a*) shall have attended one or more schools accepted for the purpose of that certificate for at least *two* years *continuously* up to the time of the examination; and (*b*) shall have passed the Junior Examination under the conditions which are set forth below.

6. A Senior School Certificate will be awarded to any candidate who (*a*) shall have attended one or more schools accepted for the purpose of that Certificate for at least *three* years *continuously* up to the time of the examination; and (*b*) shall have passed the Senior Examination under the conditions which are set forth below.

7. Students *who already hold a Junior (or Senior) Certificate* and desire to pass in one or more additional subjects may enter at a subsequent Junior (or Senior) Examination for less than the minimum number of subjects necessary for a certificate, provided they continue to attend at an accepted school. The names of such students will not appear in the Class Lists, but if, being Juniors, they pass in any subject, or, being Seniors, they obtain a Pass with Credit in any subject, they will receive Supplementary Certificates. The entrance fee for Junior candidates will be Rs. 21; for Senior candidates it will be Rs. 12·50, provided that not more than six papers in all are taken. Supplementary Certificates will not be awarded to candidates who have not stated in their forms of entry that they are candidates for Supplementary Certificates only.

8. Applications for the acceptance of a school for the School Certificate Examinations of December, 1921, must be made to the Director of Education not later than October 15, 1920.

9. Forms of entry may be had from the Director of Education in the first week in June. It is requested that Principals of schools will apply only for such number of forms of each kind (C, D, E, or F) as they *actually* require.

The names of candidates must be sent by the Principal of the school on these forms to the Director of Education so as to reach him not later than June 30, 1921. The forms must be accompanied by—

(1) Bank receipt for the fees credited to the account of the Director of Education in the Mercantile Bank of India, Ltd., Colombo, at the rate of Rs. 21 for each Junior and Rs. 25 for each Senior candidate entered. No separate fee is charged for detailed results.

N.B.—This amount should not, under any circumstances, be remitted to this office; only bank receipts will be accepted.

(2) The complete list of pupils in the Junior and Senior Certificate Classes referred to in paragraph 4 above.

(3) A certificate of birth or of baptism for every candidate. Affidavits or certificates from the Register of Past Births will not be accepted *under any circumstances*.

If the name appearing in the Register of Births differs, either by alteration or addition, from the name by which the candidate is known, the parent or guardian should, before obtaining a certificate, apply to the Registrar-General for such alterations in the manner set forth in section 7 of Ordinance No. 23 of 1900.

A certificate of baptism should be a proper extract of the Baptismal Register, *i.e.*, an exact copy of the entry of the register with a certificate at the foot of the copy as to its correctness by the incumbent of the church issuing it. Baptismal certificates will only be accepted if the candidate's baptism was within four months of his date of birth.

It is requested that the Principals of schools will see that the instructions with regard to the filling up of the forms are complied with. The candidate's full name must be given; initials are not sufficient.

Principals should also examine carefully all certificates of birth or baptism, and should not forward any certificate which is not a proper and reliable document.

Note.—All letters and parcels should be addressed: "The Director of Education, Colombo."

* At Colombo there will be centres at Ananda College, Royal College, St. Benedict's College, St. Joseph's College, and Wesley College, mainly for the convenience of boys from those schools. Girls and adult private candidates will be accommodated at other centres.

† For boys only.

10. Candidates are recommended to enter for the examination at the centre nearest to their schools. Schools presenting pupils for practical science examinations must provide themselves with properly equipped laboratories sufficient for all their candidates, who should not be entered at any other centre. Private candidates offering such subjects must satisfy themselves beforehand that satisfactory laboratory accommodation is available at the centre at which they propose to sit for the examination.

A candidate entered for examination at one centre will, under no circumstances, be allowed to sit at another centre.

11. Forms of entry will be accepted from July 1 to July 7, inclusive, on the Director's account being credited with an additional fee of Rs. 5 for each candidate so entered.

All entry forms received at the Education Office not accompanied by the Bank receipt and other necessary documents (*vide* paragraph 9) will be rejected.

12. Fees cannot be returned. If notice of withdrawal is received by the Director of Education more than sixteen days before the commencement of the examination, a voucher will be sent, which will be accepted in lieu of a part of the fee for another year. The Syndicate do not undertake to grant a similar voucher in any case in which the full sixteen days' notice has not been given. Applications made within sixteen days of the examination will, however, be considered if accompanied by a certificate from a qualified doctor stating that the candidate is physically unfit to take the examination. No applications received after the commencement of the examination can be considered. Students holding vouchers* must apply for fresh forms of entry and return them to the Director of Education on or before June 30, together with the Bank receipt and other necessary documents.

13. Candidates from schools which are suffering from any infectious disorder cannot be allowed to present themselves for examination.

14. Students are desired to observe that in cases where any of the regulations made for the conduct of the examination are disobeyed the certificate may be refused.

Education Office,
Colombo, August 20, 1920.

A. S. HARRISON,
Acting Director of Education.

JUNIOR SCHOOL CERTIFICATE EXAMINATION.

No one born before December 15, 1905, can be admitted to the examination for Junior Students under the ordinary conditions. Those born before December 15, 1905, may be admitted to the examination, but they can obtain a pass certificate only, and are not eligible for marks of distinction.

A candidate must satisfy the Examiners in—

(1) Writing from Dictation.

(2) Arithmetic. The use of algebraical symbols and processes is permitted. Questions will not be set on recurring decimals, on the process of obtaining G. C. M. by alternate division or of extracting cube root, on present worth or true discount. Questions will be set on elementary mensuration; these may involve the use of formulæ for the right-angled triangle, circle, cylinder, cone, sphere, right prism, pyramid. Candidates will be expected to give from memory only the formulæ for the triangle and the circle.†

(3) English Language and Literature (see section 2), together with at least (*a*) *three* of the twenty-four following subdivisions, *one of which must be from Groups III. or IV.*, or (*b*) *four* of the twenty-four subdivisions selected from groups I. to V., provided that not more than *two* are from any one group :—

I.—(*a*) Section 1 : Religious Knowledge.
(*b*) Section 3 : History of England, or History of the British Empire, or Roman History.
(*c*) Section 3 : Geography.

II.—(*d*) Section 4 : Latin.
(*e*) Section 5 : Greek.
(*f*) Section 6 : French.
(*g*) Section 7 : German.
(*h*) Section 8 : Spanish.
(*i*) Section 9 : Dutch.
(*j*) Section 9 (*a*) : Sinhalese.
(*k*) Section 9 (*b*) : Tamil.

III.—(*l*) Section 10 : Geometry and Algebra.
(*m*) Section 10 : Plane Trigonometry.
(*n*) Section 10 : Elementary Mechanics.

IV.—(*o*) Section 11 : Elementary Experimental Science.
(*p*) Section 12 : Chemistry (Theoretical and Practical).
(*q*) Section 13 : Physics (Theoretical and Practical).
(*r*) Section 14 : Botany.
(*s*) Section 14 : Natural History of Animals.

V.—(*t*) Section 15 : Bookkeeping.
(*u*) Section 15 : Hygiene.
(*v*) Section 16 : Drawing.
(*w*) Section 17 : Music.
(*x*) Section 18 : Needlework.

No student may enter for subjects in more than six sections, in addition to Writing, Arithmetic, and English, together with one subject from a seventh section, subject to the condition that this additional subject does not suffice for a pass in the section.

No candidate can take two papers set at the same time in the Time Table.

A certain number of marks will be assigned to Handwriting. Composition will be taken into account.

Section 1.—RELIGIOUS KNOWLEDGE : (N.B.—In and after 1921 the Revised Version of the Bible will be used instead of the Authorized Version).

Questions will be set on (*a*) the Gospel of *St. Matthew*, credit being given for a satisfactory knowledge of the original Greek ; (*b*) *II. Kings* ; (*c*) Old Testament History from the election of Saul to the death of Solomon ; (*d*) the *Acts of the Apostles*, i.–xv. ; (*e*) the Church Catechism, and the offices for Baptism and Confirmation in the Book of Common Prayer. In New Testament subjects special papers in which the Douay version is used will be prepared for those who have been accustomed to the use of that version.‡

To pass in this section, students must satisfy the Examiners in (*a*), and in one of the subjects (*b*), (*c*), (*d*), (*e*), to each of which the same credit is given. No student will be examined in more than one of the subjects (*b*), (*c*), (*d*), (*e*).

Section 2.—ENGLISH LANGUAGE AND LITERATURE :

(*a*) *Essay.*—A choice of not less than three subjects will be allowed.

(*b*) *English Language.*—A special paper of questions on grammar and idiom, framed mainly so as to test the candidate's power to use the language correctly.

(*c*) *English Literature.*—Questions of a general, not a detailed, character on the following :—(i.) *Shakespeare, Merchant of Venice* or *Scott, Quentin Durward*, (ii.) *Woodward's Second Book of English Poetry*, pages 44–101 (Pitt Press).

To pass in this section, students must satisfy the Examiners in all the three subjects (*a*), (*b*), and (*c*). Throughout the section importance will be attached to clearness and correctness of style.

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* Private candidates holding vouchers must obtain permission of the Director of Education on or before May 1, 1921 (*vide* page 19).

† Candidates will be expected to know the following tables of weights and measures, namely, avoirdupois, linear measure, square measure, capacity (pints, quarts, gallons) ; and in the metric system, the metre, the gramme, and the litre, with their multiples and submultiples. Questions may be set involving the franc and the centime, the dollar and the cent.

‡ Candidates wishing to avail themselves of this arrangement must make a statement to that effect in their forms of entry, if they omit to do so, they cannot be allowed to take the special papers.

Section 3.—HISTORY AND GEOGRAPHY :

(*a*) Outlines of the HISTORY OF ENGLAND. The paper will consist of three divisions on the periods (i.) 1066–1485, (ii.) 1485–1688, (iii.) 1688–1832 respectively. Candidates may, if they wish, select questions from all three of the divisions, or may confine themselves to two or one of them.

(*b*) Outlines of the HISTORY OF THE BRITISH EMPIRE from 1784 A.D. to 1878 A.D.

(*c*) Outlines of ROMAN HISTORY from 37 A.D. to 117 A.D.

(*d*) GEOGRAPHY (see page 7).

To pass in this section, students must satisfy the Examiners in either (*a*), (*b*), or (*c*), and also in (*d*). No student will be examined in more than one of the three subjects (*a*), (*b*), (*c*).

Section 4.—LATIN :

Two papers will be set. Paper I. will include (1) questions on grammar and parsing; (2) one or more easy unprepared passages for translation into English, a vocabulary of the less familiar words being given; (3) simple sentences for translation into Latin; (4) an easy continuous passage for translation into Latin.

Paper II. will contain (*a*) passages for translation from selected books, with questions, and (*b*) *as alternatives*, to either or both of the portions of set books, unprepared passages for translation into English, with questions.

The selected books for 1921 are: *Caesar, de Bello Gallico II.* and *III.*, and *Virgil, Aeneid II.* Candidates may take any two, but not more than two, of the following portions of these books :—(i.) *de Bello Gallico II.*; (ii.) *de Bello Gallico III*; (iii.) *Aeneid II.*, 1–401; (iv.) *Aeneid II.*, 402–804.

Students must reach a certain standard in the subject as a whole, and must also satisfy the Examiners separately in Paper I. To gain the mark of distinction they must reach a higher standard both in the subject as a whole and in Paper I.

Section 5.—GREEK :

Two papers will be set. Paper I. will include (1) questions on grammar and parsing; (2) one or more easy unprepared passages for translation into English, a vocabulary of the less familiar words being given; (3) simple sentences for translation into Greek.

Paper II. will contain (*a*) passages for translation from selected books, with questions, and (*b*) *as alternatives*, to either or both of the portions of set books, unprepared passages for translation into English, with questions.

The selected books for 1921 are: *Xenophon, Anabasis II.*, and *Scenes from Sophocles' Ajax.* Candidates may take any two, but not more than two, of the following portions of these books :—(i.) *Anabasis II.*, 1–3; (ii.) *Anabasis II.*, 4–6; (iii.) *Scenes from Sophocles' Ajax*, 1–419; (iv.) *Scenes from Sophocles' Ajax*, 348–785.

Students must reach a certain standard in the subject as a whole, and must also satisfy the Examiners separately in Paper I. To gain the mark of distinction they must reach a higher standard both in the subject as a whole and in Paper I.

Section 6.—FRENCH. Section 7.—GERMAN :*

In sections 6 and 7 the paper will include (1) questions on grammar; (2) unprepared passages for translation into English, a vocabulary of the less familiar words being given; (3) easy English sentences for translation into the language; (4*a*) one or more continuous passages for translation into the language, and (4*b*) *as an alternative*, subjects on one of which candidates are to write a short composition in the language.

No candidate may take both (4*a*) and (4*b*).

In order to pass in French or German, candidates must reach a certain standard in the subject as a whole. In order to gain the mark of distinction they must reach a higher standard in the subject as a whole, and must also reach a certain standard in (2) and in (4*a*) or (*b*).

For the examination in Spoken French and Spoken German, see page 7.

Section 8.—SPANISH. Section 9.—DUTCH.

The paper will include (1) questions on grammar; (2) passages for translation into English; (3) passages for translation into the language.

Section 9 (*a*).—SINHALESE :

Two papers will be set. Paper I. will include questions on the set books.

Paper II. will include questions in grammar, unprepared translation from Sinhalese into English and translation into Sinhalese (composition).

The selected books for 1921 are: (1) Ummagga Jatakaya to the end of Sirimanda Prasnaya and (2) Loweda Sangarawa or Buduguna Alankaraya verses 10–186.

Students must reach a certain minimum in Paper II. taken as a whole, and a higher minimum in Papers I. and II. taken together. To gain the mark of distinction, they must reach a higher standard in the subject as a whole, and must also reach a certain standard in translation and composition.

Section 9 (*b*).—TAMIL :

Two papers will be set. Paper I. will include questions on the set books.

Paper II. will include questions in grammar, unprepared translation from Tamil into English and translation into Tamil (composition).

The selected books for 1921 are: (1) Sakuntala, published by Longman's Green & Co. and (2) Nalavenbakalitodar Kandam.

Students must reach a certain minimum in Paper II. taken as a whole, and a higher minimum in Papers I. and II. taken together. To gain the mark of distinction they must reach a higher standard in the subject as a whole, and must also reach a certain standard in translation and composition.

Section 10.—MATHEMATICS :

For all the subjects in this section, except Geometry, candidates will be provided in the examination with four-figure tables of logarithms.†

(*a*) GEOMETRY (see page 8).

(*b*) ALGEBRA.—The paper will consist of two parts. Candidates can pass in Algebra by doing sufficiently well in Part I.

PART I.—Questions may be set on elementary algebraic operations; simple equations; simple simultaneous equations containing not more than two unknown quantities; easy problems leading to such equations; fractions with numerical denominators, resolution into factors; quadratic equations containing only one unknown quantity, problems leading to such equations, easy fractions. Simple questions may be set on fractional and negative indices (formal proofs not being required), and on logarithms to base 10, with the use of four-figure tables. Questions will be set on graphs and their applications. Questions of an arithmetical character, capable of solution by algebraical processes, but not necessarily requiring the aid of such processes, may be set.

PART II.—Questions may be set on the solution of two simultaneous equations, one being linear and one being quadratic; variation; the gradient of a graph; arithmetical progression and finite geometrical progression.

Candidates will be provided in the examination room with squared paper. They should bring graduated rulers.

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* In writing German in the examination candidates will not be required to use German characters, but credit will be given for the use of German characters, provided that the writing is well formed and legible.

† The tables which will be provided are the Cambridge Four-Figure Mathematical Tables containing logarithms of numbers, of sines and cosines, of tangents and cotangents; sines and cosines, tangents and cotangents. Copies can be obtained from Syndicate Buildings, Cambridge, price four pence, post free.

(*c*) PLANE TRIGONOMETRY, including the solution of triangles and the use of logarithms. Addition theorems. Questions will not be set involving angles greater than 360 degrees. Some of the questions will be limited to easy numerical Trigonometry. Candidates should bring graduated rulers and protractors.

(*d*) ELEMENTARY MECHANICS.—Questions may be set on the composition and resolution of forces acting in one plane at a point, including graphical representation of the same; parallel forces; moments of forces about a point; the properties of the centre of gravity; simple applications to the lever, the common balance, the inclined plane, and the block-and-tackle; the composition and resolution of velocities and accelerations in one plane; rectilinear motion with uniform acceleration, including gravity; mass, momentum, dynamical measure of force. Candidates should bring graduated rulers and protractors. Formal proofs of the parallelogram of forces and of velocities and of the method of obtaining the resultant of two parallel forces will not be required.

To pass in this section, students must satisfy the Examiners in (*a*) and in (*b*).

*Section 11.—ELEMENTARY EXPERIMENTAL SCIENCE (see page 10).†

Students will be expected to show that they have acquired a practical acquaintance with the elements of physical and chemical measurement, and with the properties of common substance as ascertained by simple experiments. Three papers will be set, one of which (Paper III.) will be a practical examination.

*Section 12.—CHEMISTRY (see page 11).†

(*a*) THEORETICAL CHEMISTRY.

(*b*) PRACTICAL CHEMISTRY. *Alternative papers will be set (see the Time Table).*

To pass in this section, students must satisfy the Examiners in the two papers taken together, provided that a certain standard is attained on the written work.

*Section 13.—PHYSICS (see page 11).†

(*a*) HEAT. *Alternative papers will be set (see the Time Table).*

(*b*) SOUND AND LIGHT.

(*c*) ELECTRICITY AND MAGNETISM. *Alternative papers will be set (see the Time Table).*

(*d*) PRACTICAL PHYSICS.

In this section the questions will be principally such as will test the candidates' knowledge of the subject as gained from a course of experimental instruction.

To pass in this section, students must satisfy the Examiners in two of the three subjects (*a*), (*b*), (*c*), and in (*d*).

*Section 14.—(*a*) BOTANY (see page 13).

(*b*) NATURAL HISTORY OF ANIMALS (see page 15).

To pass in this section, students must satisfy the Examiners in one of the two subjects. They may not take both.

Section 15.—(*a*) BOOKKEEPING. Questions will be set on Bookkeeping by double entry. Ruled forms will be provided for the candidates. *Alternative papers will be set (see the Time Table).*

(*b*) HYGIENE (see page 16).

To pass in this section, students must satisfy the Examiners in one of the two subjects. They may take both.

Section 16.—DRAWING:

(*a*) FREEHAND DRAWING, from a photograph or print. The examination will be designed to test the power of the candidates to draw accurately and intelligently. The drawings are to be executed in pencil.

(*b*) MODEL DRAWING.—The group will consist of one or two of the following solids, namely, the cube, square prism, cylinder, cone, triangular prism, square pyramid, hexagonal prism, and ring, together with some common object and a drawing board. The group is to be drawn in outline with pencil, and may be lightly shaded in pencil.

(*c*) GEOMETRICAL DRAWING.—Construction of triangles, quadrilaterals, polygons, and circles from given data. Division of the circle and measurement of angles. Proportional division of lines, including third, fourth, and mean proportionals. Construction of scales. Problems relating to areas. Construction of the ellipse, drawing of its tangents and normals. Drawing of curves defined by simple conditions and forms of arches. Inscribing and describing rectilinear figures and circles within and about others. Application of geometrical construction to patterns drawn to scale. Plans and elevations of simple right solids, such as cube, cone, cylinder, prism, sphere, square and hexagonal pyramid in easy positions. *Alternative papers will be set (see the Time Table).*

(*d*) ELEMENTARY DESIGN OR SPACE FILLING.—Candidates will be supplied with a photograph or print of some characteristic portion of a plant, and will be required to fill a given space with a coloured design based thereon.

(*e*) MEMORY DRAWING.—Candidates will be required to draw simple objects from memory, the drawing to be executed in any medium. *Alternative papers will be set (see the Time Table).*

(*f*) MECHANICAL DRAWING.—Drawing to scale, from given data, in plan, elevation, and section, tools and simple parts of machinery, such as hammerheads, spanners, callipers, rivets, and riveted joints, nuts and bolts, pipes and pipe joints, lubricators, shaft couplings, bearings, and connecting rods.

To pass in this section, students must satisfy the Examiners in two of the six subjects, of which (*a*) or (*b*) must be one. They may not take more than two of the four subjects (*c*), (*d*), (*e*), (*f*).

Section 17.—MUSIC:

(*a*) Questions will be set on Notation; on Scales, Clefs, Keys, Intervals, Time; on the Marks and Terms generally employed in Music; on Cadences. (*b*) Exercises will be set, in not more than four parts, on Triads and their Inversions, and the Dominant Seventh without Inversions; in these exercises the lowest part, with or without figuring, will be given, and passing notes may be used. Candidates cannot pass by answering questions on (*a*) only. *Alternative papers will be set (see the Time Table).*

Section 18.—NEEDLEWORK (see page 18).

SENIOR SCHOOL CERTIFICATE EXAMINATION.

The examination will comprise the subjects included in the following four groups. Every student will be required to reach a certain minimum standard in each of the three Groups, I., II., III., and in two additional subjects from among those included in these three groups, and also to attain a satisfactory standard in the examination as a whole. Towards the attainment of this standard subjects in Group IV. will be counted if the student reaches a pass with credit in them.

No subjects will be specified on the certificate except those in which the student reaches the Pass with Credit,‡ *i.e.*, a standard higher than the minimum standard required for the group.

Students may be admitted as candidates for a pass certificate without limitation as to age, but those born before December 15, 1903, will not be eligible for inclusion in an Honours class or for marks of distinction.

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* To pass in any Science section, candidates must satisfy the Examiners in both the theoretical and practical parts of the subject. The Science subjects can be taken at those centres only at which a suitable laboratory and apparatus can be provided. A special local fee may be charged.

† Candidates will be provided with mathematical tables in all papers in Chemistry and Physics; they may bring their slide rules in the practical examination in Chemistry and Experimental Science.

‡ In the regulations for 1917 and 1918 this standard was described as the Standard of Recognition.

No student may enter for more than 10 subjects. For the award of Honours, marks gained in not more than 8 subjects in which a Pass with Credit has been reached will be counted. Except in subject 1, no student may take two papers set at the same time in the Time Table.

In subjects 1, 13, 14, 27, students may enter for a single paper.* In subjects 5, 6, 11, 12, 16, 17, 20, 28, they may not enter for a single paper.

GROUP I.

(Candidates must satisfy Examiners in the whole of the English section.)

1. RELIGIOUS KNOWLEDGE: † (N.B.—In and after 1921 the Revised Version of the Bible will be used instead of the Authorized Version.)

The examination will consist of questions on (*a*) the Gospel of *St. Matthew*, credit being given for a satisfactory knowledge of the original Greek; (*b*) the *Acts of the Apostles*, i.–xv.; (*c*) *II. Kings*; (*d*) Old Testament History from the birth of Samuel to the death of David, with reference to *I.* and *II. Samuel* and *I. Kings*, i., ii.; (*e*) Galations (*alternative papers will be set*); (*f*) The Preface to the Book of Common Prayer, "Concerning the Service of the Church," "Of Ceremonies," and the Order for Morning and Evening Prayer; questions will be set on the history of these portions of the Prayer Book (special attention should be paid to the Apostles' Creed); (*g*) The Church Catechism and the Office for Holy Communion in the Book of Common Prayer. In New Testament subjects special papers in which the Douay version is used will be prepared; see footnote ‡ on page 2.

Students must satisfy the Examiners in two of these papers taken together. They may offer three papers, but they will not be required to take more than two papers in order to obtain the mark of distinction. No student can take both (*c*) and (*d*), or both (*f*) and (*g*).

2. ENGLISH LANGUAGE AND LITERATURE:

(*a*) *Essay.*—A choice of not less than three subjects will be allowed.

(*b*) *English Language.*—A special paper of questions testing the candidate's knowledge and command of English. These may include questions on précis writing, paraphrase, and analysis of sentences.

(*c*) *Literature.*—Questions of a general, and not a detailed, nature on the following books:—

(i.) Shakespeare, *Merchant of Venice.*

(ii.) Bacon, *Essays I.—XXVIII.* or *Lamb's Essays of Elia* (First Series).

(iii.) Palgrave's, *Golden Treasury, Book IV.* (Macmillan).

3. HISTORY:

(*a*) HISTORY OF ENGLAND.—The paper will consist of four sections on the periods (i.) 1066 to 1485, (ii.) 1485 to 1688, (iii.) 1688 to 1815, (iv.) 1815 to 1914 respectively. Candidates may select questions from one or two of the sections.

(*b*) HISTORY OF THE BRITISH EMPIRE, 1784 A.D to 1878 A.D.

(*c*) Outlines of MODERN EUROPEAN HISTORY, 1815 A.D. to 1878 A.D., with questions on the most important events in the periods 1789 to 1814 and 1879 to 1910.

(*d*) ROMAN HISTORY, from 37 A.D. to 117 A.D.

(*e*) GREEK HISTORY, 433 B.C. to 359 B.C.

Only one of the above five papers may be taken.

4. GEOGRAPHY (see page 7).

Geography may be taken either in Group I. or in Group III.

GROUP II.

(Candidates must satisfy the Examiners in one of the subjects 5 to 12.)

5. LATIN:

Two papers will be set. Paper I. will include (1) questions on grammar; (2) one or more easy unprepared passages for translation into English, a vocabulary of unfamiliar words being given; (3) easy sentences for translation into Latin; (4) a continuous passage for translation into Latin.

Paper II. will contain (*a*) passages for translation from selected books, with questions, and (*b*) *as alternatives*, for either or both of the set books, unprepared passages for translation into English, with questions.

The selected books for 1921 are either *Livy XXI.*, 1–46, or *Cicero, in Catilinam I.–IV.*; and either *Virgil, Aeneid II.*, or *Horace, Epistles I.*, 1, 2, 6, 7, 10, 13–17.

Students must reach a certain standard in the subject as a whole, and must also satisfy the Examiners separately in Paper I. To gain the mark of distinction they must reach a higher standard both in the subject as a whole and in Paper I.

6. GREEK:

Two papers will be set. Paper I. will include (1) questions on grammar; (2) one or more easy unprepared passages for translation into English, a vocabulary of unfamiliar words being given; (3) easy sentences for translation into Greek.

Paper II. will contain (*a*) passages for translation from selected books, with questions, and (*b*) *as alternatives*, for either or both of the set books, unprepared passages for translation into English, with questions.

The selected books for 1921 are either *Thucydides VI.*, 1–41, or *Plato, Apolgia Socratis*; and either *Homer, Odyssey V., VI.*, or *Sophocles, Ajax.*

Students must reach a certain standard in the subject as a whole, and must also satisfy the Examiners separately in Paper I. To gain the mark of distinction they must reach a higher standard both in the subjects as a whole and in Paper I. *Alternative Greek II. papers will be set.*

7. FRENCH.

Candidates may enter for either of the following syllabuses:—

A.—The paper will consist of (1) passages for translation into English; (2) two passages of English for translation into French: as an alternative to the harder passage, subjects will be given, on one of which candidates may write a short

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* No statement of the standard reached in a single paper in any of these subjects will be made in the Detailed Report, except in subject 27, or on the certificate except in subject 14. See note † on page 6.

† Papers on the following subjects will be included in the Senior Syllabus for 1922 and 1923 respectively:—

1922: (*a*) *St. Mark*; (*b*) *The Acts of the Apostles* xiii.–xxviii.; (*c*) *Ezra, Nehemiah*, and *Haggai*; (*d*) History of the Nothern and Southern Kingdoms from the death of David to the death of Jeroboam II., with reference to *I. Kings, II. Kings* i.–xiv., *Hosea, Amos*; (*e*) *I. Corinthians.* Students may not take both (*c*) and (*d*).

1923: (*a*) *St. Luke*; (*b*) *The Acts of the Apostles*, i.–xv.; (*c*) *Genesis* xii.–xxiv., xxvii.–xxxv., xxxvii., xxxix.–end, *Exodus* i.–xx.; (*d*) History of the Northern and Southern Kingdoms from the death of Jeroboam II. to the Captivity of Judah, with reference to *II. Kings* xv.–end, *Isaiah* i.–xi. and xxviii.–xxxi., *Jeremiah* i.–ix. and xviii.–xxxix.; (*e*) *Phillippians* and *I. Peter.* Students may take both (*c*) and (*d*).

composition in French. Students must reach a certain standard in the subject as a whole. To gain the mark of distinction they must reach a higher standard in the subject as a whole, and must also reach a certain standard in (1) and in (2). (For Spoken French, see page 7).

B.—Candidates will be required to reach a certain standard both in Spoken French and in a paper consisting of (1) passages of French for translation into English ; (2) free composition in French. To gain the mark of distinction they must reach a higher standard in the subject as a whole, and must also reach a certain standard in (1) and in (2). (For Spoken French, see page 7).

8. GERMAN :*

The paper will consist of (1) passages for translation into English ; (2) two passages of English for translation into German : as an alternative to the harder passage, subjects will be given, on one of which they may write a short composition in German.

Students must reach a certain standard in the subject as a whole. To gain the mark of distinction they must reach a higher standard in the subject as a whole, and must also reach a certain standard in (1) and in (2).

For the examination in Spoken German, see page 7.

9. SPANISH. 10. DUTCH :

The paper will include (1) passages for translation into English ; (2) passages for translation into the language.

Students must reach a certain standard in either subject as a whole. To gain the mark of distinction they must reach a higher standard in the subject as a whole, and must also reach a certain standard in (1) and in (2).

Section 11.—SINHALESE :

Two papers will be set. Paper I. will include questions on the set books.

Paper II. will include questions in grammar, unprepared translation from Sinhalese into English and translation into Sinhalese (composition).

The selected books for 1921 are : (1) Nikaya Sangrahaya and (2) Guttila Kavyaya verses 101–200.

Students must reach a certain minimum in Paper II. taken as a whole, and a higher minimum in Papers I. and II. taken together. To gain the mark of distinction they must reach a higher standard in the subject as a whole, and must also reach a certain standard in translation and composition.

Section 12.—TAMIL :

Two papers will be set. Paper I. will include questions on the set books.

Paper II. will include questions in grammar, unprepared translation from Tamil into English and translation into Tamil (composition).

The selected books for 1921 are : (1) Tamil Essays by Chelvakasavaraya Mudaliyar and (2) Kural, Chapters XV.-XXIV., *or* Villi-Bharatam : Krishnam Tootu Charukkam.

Students must reach a certain minimum in Paper II. taken as a whole, and a higher minimum in Papers I. and II taken together. To gain the mark of distinction they must reach a higher standard in the subject as a whole, and must also reach a certain standard in translation and composition.

GROUP III.

(*Candidates must satisfy the Examiners either in one of the subjects 13 to 17, or in Arithmetic, together with one of the subjects 18 to 21, or with Geography.*)

Except in Arithmetic, candidates taking mathematical papers will be provided in the examination room with mathematical tables (see footnote † on page 3) ; they should bring graduated rulers and protractors for all papers in which they are likely to be required.

13. MATHEMATICS :

(*a*) ARITHMETIC (see the Junior Syllabus for Arithmetic on page 2).

(*b*) GEOMETRY (see page 8), with a few easy questions on numerical Trigonometry.

(*c*) ALGEBRA.—Questions will be set on elementary algebra including the solution of two simultaneous equations, one being linear and one being quadratic ; variation ; the gradient of a graph ; arithmetical progression and finite geometrical progression. Candidates will be provided in the examination room with squared paper. They should bring graduated rulers.

Students must satisfy the Examiners in the three papers taken together.

14. MORE ADVANCED MATHEMATICS.† Two papers will be set :

Paper I.—(*a*) Algebra : harder questions on the syllabus for subject 13 (*c*), and easy questions on more advanced work, including permutations and combinations and the use of the binomial, exponential, and logarithmic expansions. Geometry : harder questions on the syllabus for subject 13 (*b*), on other properties of triangles and circles, and on the elementary geometry of the plane and sphere. Trigonometry : to solution of triangles. Graphs of trigonometrical function ; addition theorems ; problems in two and three dimensions.

Paper II.—(*b*) Elements of Analytical Geometry. Easy questions on the straight line, the circle, and conic sections referred to principal rectangular axes. (*c*) Elements of Differential Calculus, including the differentiation of simple functions, turning values, tangents and normals ; easy physical applications.

Students must satisfy the Examiners in (*a*) and in either (*b*) or (*c*). They may take all three.

15. APPLIED MATHEMATICS, including the equilibrium of forces acting in one plane ; the properties of the centre of gravity ; friction ; the lever, the common balance, the inclined plane, and the block-and-tackle ; the composition and resolution of velocities and accelerations in one plane ; rectilinear motion with uniform acceleration ; mass, momentum, dynamical measure of force ; work, energy, power ; the time of flight, greatest height and horizontal range of a projectile. In some simple questions candidates may be required to use graphical methods.

16. CHEMISTRY ‡ (see page 11) : Theoretical Chemistry ; Practical Chemistry.—Students must satisfy the Examiners in the subject as a whole, reaching a certain standard in the written work.

17. PHYSICS ‡ (see page 11) : Experimental Mechanics ; Heat ; Sound and Light ; Electricity and Magnetism.—Questions will be set on fundamental laws and the experiments that illustrate them.

Two papers will be set in addition to a practical paper. Each of the three papers will contain questions on all the four branches of the subject.

Students must show a knowledge of more than one branch of the subject and satisfy the Examiners in the three papers taken together, reaching a certain standard in the written work.

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* See note * on page 3.

† If a candidate passes with credit in a single paper of subject 14 this will be stated on the certificate, provided that the candidate also passes with credit in subject 13.

‡ To pass in this section, candidates must satisfy the Examiners in both the theoretical and practical parts of the subject. These subjects can be taken at those centres only at which a suitable laboratory and apparatus can be provided. A special local fee may be charged. Candidates will be provided with mathematical tables in all papers in Chemistry and Physics ; they may bring their slide rules in the practical examinations in both subjects.

18. BOTANY (see page 13).—The examination will include a practical test.

19. NATURAL HISTORY OF ANIMALS (see page 15).—The examination will include a practical test.

20. AGRICULTURAL SCIENCE (see page 16).—Two papers will be set. Students must satisfy the Examiners in both papers taken together.

21. DOMESTIC SCIENCE (for girls only) (see page 17).—Candidates cannot enter for this subject unless they either have passed in Elementary Experimental Science in the Junior Examination, or produce evidence that they have taken a practical course in Elementary Physics and Chemistry.

GEOGRAPHY (see page 5).

GROUP IV.

22. LOGIC.—The Elements of Logic.

23. BOOKKEEPING.—Questions will be set on Bookkeeping by double entry. Ruled forms will be provided for the candidates. *Alternative papers will be set.*

24. MENSURATION AND SURVEYING.—Questions will be set on Mensuration and on the Elements of Land Surveying and Levelling. Candidates will be provided in the examination room with tables of logarithms (see footnote † on page 3). They should provide themselves with rulers, scales, &c.

25. SHORTHAND.—Students will be required to take down passages read aloud, and afterwards to transcribe them. Passages will be dictated at the rates of seventy words and ninety words per minute.

No student may take both subject 24 and subject 25.

26. DRAWING:

(*a*) FREEHAND DRAWING, from a photograph or print.—The examination will be designed to test the power of the candidates to draw accurately and intelligently. The drawings may be executed in any medium.

(*b*) MODEL DRAWING.—The group will consist of common objects together with one or more of the following solids: the cube, square prism, cylinder, cone, triangular prism, square pyramid, equilateral triangular pyramid (regular tetrahedron), hexagonal prism, skeleton cube, and ring; it is to be drawn and shaded with pencil, chalk, or wash of any one colour.

(*c*) PERSPECTIVE DRAWING.—Geometrical and common objects in parallel and angular perspective, above and below the horizon.

(*d*) DESIGN.—Candidates will be supplied with a photograph or print of some characteristic portion of a plant and will be required to fill a given space with a design based thereon. They will be asked to state the purpose for which their designs are intended; if the purpose stated precludes the use of colour, a design in black and white will be accepted; otherwise the design must be coloured.

(*e*) MEMORY DRAWING.—Candidates will be required to draw from memory a group of simple objects, which may include figures or plants, the drawing to be executed in any medium. *Alternative papers will be set (see the Time Table).*

(*f*) MECHANICAL DRAWING.—The syllabus is the same as for Juniors (page 4), with the addition of pulley wheels, eccentrics, cranks, pistons, cylinders, &c.

Students must satisfy the Examiners in two of the above, of which (*a*) or (*b*) must be one. They may not take more than two of the four papers (*c*), (*d*), (*e*), (*f*).

27. MUSIC.—Questions will be set on Notation; Scales, Clefs, Keys, Intervals, Time; the Marks and Terms generally employed in Music; Cadences; Triads and Chords of the Dominant Seventh and their Inversions; Single Suspensions. On the above Chords exercises (in not more than four parts) will be set, in which the highest or the lowest part will be given, the latter being either figured or unfigured. Passing notes may be used. Questions will also be set on Parry's *Studies of the Great Composers* (Routledge), Chapters 8–10.

28. NEEDLEWORK (see page 18). There will be a theoretical and a practical paper. Candidates must pass in both.

29. HYGIENE (see page 17).

EXAMINATION IN SPOKEN FRENCH AND GERMAN.

Candidates entering for the spoken examination in either language must also enter for the paper in the same language at the same examination,* and if they reach the required standard therein and also in the spoken examination, the fact of their having satisfied the Examiners in the spoken examination will be entered on their certificate.

The spoken examination will not be necessary for passing in the language (except for Seniors offering the French Syllabus B) or for the mark of distinction; it will, however, be taken into account in determining the position of candidates in the general Class List, and it will be counted towards the mark of distinction in cases where the mark of distinction would not be obtained without it.

In the Junior and Senior Examinations candidates will be required (1) to read aloud a passage of French, or German; (2) to write a passage of French, or German, from dictation; (3) to hold a short conversation in French, or German, with the Examiner.

For the Junior and Senior Examinations candidates may, but are not obliged to, offer a portion of a French or German author, on which, if approved by the Syndicate, the conversation may be partly based. A book or a portion of a book containing less than 6,000 words will not be approved. A list of certain books already approved may be obtained from the General Secretary. Application with regard to books not already approved must be received by the Director of Education not later than May 12, and must be accompanied by a copy of the book.

The oral examination can be held in Colombo only. The fee is Rs. 5 per candidate (the minimum payable by any school or by a private candidate being Rs. 15 for each language).

GEOGRAPHY SYLLABUS.

Questions will be set on the assumption that the principles of Physical Geography form the basis of the teaching. Special attention should be directed to the inter-relations between the activities of man and his physical environment. Therefore, in each region studied, attention should be drawn to such physical data as position and size, relief, coastlines,

* Senior candidates, however, who have already obtained a certificate upon which the Written Examination in either of the languages is recorded, may enter at a subsequent examination for the spoken examination in the same language, and, if successful, they will receive a supplementary certificate to that effect. The fee, as stated above, together with a share of the Examiner's expenses, must be paid. The date with index number when such senior students gained the certificates must be given on the oral entry forms, and the full name and address must in addition be given on the back of the form.

annual and seasonal distribution of temperature and rainfall, natural vegetation, mineral wealth, &c. The human and economic geography should be taught in close relationship with this physical basis, and such topics as leading occupations, distribution of population, means of communication, town sites, political boundaries, modes of living, &c., should receive special attention. At the Senior stage the work will naturally be of a more advanced character.

Pupils should be trained to draw sections showing the relief of the regions they study. They should be able to draw sketch maps or diagrams to explain or illustrate the written parts of their answers. They may be required to insert certain geographical features or to indicate distributions (*e.g.*, rainfall, coalfields, population) on outline maps.

Juniors.

(A reasonable choice of Questions will be given.)

(i.) *General World Geography, including Map-work.*—Study of the globe. Size, shape, and movements of the earth. Latitude and longitude. The continents and oceans. The narrower seas and straits. Simple studies of the principal highland and lowland regions. Elementary studies of climate. Prevailing winds. The distribution of rainfall and temperature. The distribution of natural forest land, grass land, and desert. Different types of regions, such as tropical forests, hot deserts, tundra, temperate grass lands, &c., with special reference to the life of man.

Map Study: The use and reading of maps, *e.g.*, the one-inch sheet of the local Ordinance Map.

(ii.) *The British Isles.*

(iii.) *The Geography of one of the following*:—(*a*) Europe, (*b*) Asia, (*c*) America (North of Mexico), and the West Indies

(ii.) and (iii.) are to be treated along the lines broadly indicated in the Introduction to this Syllabus.

Seniors.

(A reasonable choice of Questions will be given.)

(i.) *General, Physical, and World Geography, including Map-work.*—The size, shape, and movements of the earth. Latitude and longitude. Longitude and time. Standard time. Distribution of land and water. Ocean currents, and a description (not the causes) of tidal phenomena. The general relief of the land. Mountains, plateaus, plains, river systems, lakes, &c. Costlines and continental shelves. The distribution of atmospheric pressure. The wind sytems. Annual and seasonal distribution of rainfall and temperature. Types of climate. The distribution of natural vegetation. The chief types of natural occupations. The major natural regions of the world.

Map Work.—Outlines of methods used in the construction of maps. The reading of topographical maps and the preparation, from furnished data, of statistical, climatic, contour, and other similar maps. The variation of the compass.

(ii.) The outlines of the regional and political geography of the world. The methods of treatment will be those broadly indicated in the Introduction to the Syllabus. The same amount of detail will, however, not be required in all parts of the world. Most attention should be given to the British Isles. The more important regions of Europe and North America will be required in somewhat less detail. The rest of the world in decreasing detail, but certain areas, *e.g.*, the major parts of the British Empire, China, Japan, and the most important of the South American States, should receive more attention than the rest of the continents of which they form a part.

N.B.—It is realized that the whole of the work set out above for the Senior Examination cannot be taught in one year. It is therefore strongly recommended that schools should frame their geographical courses so that the whole of the work leads up to the World Geography now required by the Senior Syllabus.

In the Regulations for 1920 the Syndicate have already announced for Senior Geography in 1921 the following areas:—(*a*) Europe (including the British Isles), (*b*) Asia, (*c*) America (North of Mexico), and the West Indies. A paper will be set for candidates who wish to be examined on one of these areas, as an alternative to the paper on the Syllabus given above.

SYLLABUS IN GEOMETRY.

General Instructions applicable to the Junior and Senior Examinations.

The papers in Geometry will contain questions on Practical and on Theoretical Geometry. Every candidate will be expected to answer questions in both branches of the subject.

The questions on Practical Geometry will be set on the constructions contained in the annexed Schedule A, together with easy extensions of them. In cases where the validity of a construction is not obvious, the reasoning by which it is justified may be required. Every candidate must provide himself with a ruler graduated in inches and tenths of an inch, and in centimetres and millimetres, a set square, a protractor, compasses, and a fairly hard pencil. All figures must be drawn accurately and distinctly. Questions may be set in which the use of the set square or of the protractor is forbidden.

The questions on Theoretical Geometry will consist of theorems contained in the annexed Schedule B, together with questions upon these theorems, easy deductions from them, and arithmetical illustrations. Any proof of a proposition will be accepted which appears to the Examiners to form part of a systematic treatment of the subject; the order in which the theorems are stated in Schedule B is not imposed as a sequence of their treatment. In the proof of theorems and deductions from them, the use of hypothetical constructions will be permitted.

Junior Examination.

Attention is called to the General Instructions above.

The paper will consist of two parts, each containing questions on Practical and on Theoretical Geometry. Candidates can pass in Geometry by doing sufficiently well in Part I. The use of algebraical symbols is permitted.

Part I.—Questions will be set on Schedules A (i.), A (ii.), and B (i.), B (ii.).

Candidates will also be expected to be acquainted with the forms of the simpler solid bodies, namely, the cube, the rectangular block, the tetrahedron, the sphere, the cylinder, the wedge, the pyramid, and the cone.

Part II.—Questions will be set on Schedules A (iii.) and B (iii.).

Senior Examination.

Attention is called to the General Instructions above.

Questions will be set on Schedules A (i.), A (ii.), A (iii.), and B (i.), B (ii.), B (iii.). The use of algebraical symbols and (in the solution of riders) of trigonometrical ratios is permitted.

SCHEDULES.

Schedule A. (Practical.)

A (i.).

Bisection of angles and of straight lines.
Construction of perpendiculars to straight lines.
Construction of an angle equal to a given angle.
Construction of parallels to a given straight line.
Simple cases of the construction from sufficient data of triangles and quadrilaterals.
Division of straight lines into a given number of equal parts or into parts in any given proportions.

A (ii.).

Construction of a triangle equal in area to a given polygon.
Construction of tangents to a circle and of common tangents to two circles.
Construction of circumscribed, inscribed, and escribed circles of a triangle.

A (iii.).

Simple cases of the construction of circles from sufficient data.
Construction of a fourth proportional to three given straight lines and a mean proportional to two given straight lines.
Construction of regular figures of 3, 4, 6, or 8 sides in or about a given circle.
Construction of a square equal in area to a given polygon.

Schedule B. (Theoretical.)

B (i.).

Angles at a Point.

*If a straight line stands on another straight line, the sum of the two angles so formed is equal to two right angles and *the converse.

*If two straight lines intersect, the vertically opposite angles are equal.

Parallel Straight Lines.

When a straight line cuts two other straight lines, if (i.) a pair of alternate angles are equal, or (ii.) a pair of corresponding angles are equal, or (iii.) a pair of interior angles on the same side of the cutting line are together equal to two right angles, then the two straight lines are parallel ; and *the converse.

Straight lines which are parallel to the same straight line are parallel to one another.

Triangles and Rectilinear Figures.

The sum of the angles of a triangle is equal to two right angles.

If the sides of a convex polygon are produced in order, the sum of the angles so formed is equal to four right angles.

If two triangles have two sides of the one equal to two sides of the other, each to each, and also the angles contained by those sides equal, the triangles are congruent.

If two triangles have two angles of the one equal to two angles of the other, each to each, and also one side of the one equal to the corresponding side of the other, the triangles are congruent.

If two sides of a triangle are equal, the angles opposite to these sides are equal ; and the converse.

If two triangles have the three sides of the one equal to the three sides of the other, each to each, the triangles are congruent.

If two right-angled triangles have their hypotenuses equal, and one side of the one equal to one side of the other, the triangles are congruent.

If two sides of a triangle are unequal, the greater side has the greater angle opposite to it ; and the converse.

Of all the straight lines that can be drawn to a given straight line from a given point outside it, the perpendicular is the shortest.

The opposite sides and angles of a parallelogram are equal, each diagonal bisects the parallelogram, and the diagonals bisect one another.

If there are three or more parallel straight lines, and the intercepts made by them on any straight line that cuts them are equal, then the corresponding intercepts on any other straight line that cuts them are also equal.

Loci.

The locus of a point which is equidistant from two fixed points is the perpendicular bisector of the straight line joining the two fixed points.

The locus of a point which is equidistant from two intersecting straight lines consists of the pair of straight lines which bisect the angles between the two given lines.

B (ii.).

Areas.

Parallelograms on the same or equal bases and of the same altitude are equal in area.

Triangles on the same or equal bases and of the same altitude are equal in area.

Equal triangles on the same or equal bases are of the same altitude.

* In a right-angled triangle, the square described on the hypotenuse is equal to the sum of the squares described on the sides containing the right angle ; and the converse.

* Proofs of these theorems will not be required.

The Circle.

A straight line drawn from the centre of a circle to bisect a chord which is not a diameter, is at right angles to the chord ; conversely, the perpendicular to a chord from the centre bisects the chord.

There is one circle, and one only, which passes through three given points not in a straight line.

Equal chords of a circle are equidistant from the centre; and the converse.

The tangent at any point of a circle and the radius through the point are perpendicular to one another.

If two circles touch, the point of contact lies on the straight line through the centres.

The angle which an arc of a circle subtends at the centre is double that which it subtends at any point on the remaining part of the circumference.

Angles in the same segment of a circle are equal; and, if the line joining two points subtends equal angles at two other points on the same side of it, the four points lie on a circle.

The angle in a semicircle is a right angle; the angle in a segment greater than a semicircle is less than a right angle and the angle in a segment less than a semicircle is greater than a right angle.

The opposite angles of any quadrilateral inscribed in a circle are supplementary; and the converse.

B (iii.).

Areas.

Illustrations and explanations of the geometrical theorems corresponding to the following algebraical identities :—

$$k(a + b + c + \ldots) = ka + kb + kc + \ldots,$$
$$(a + b)^2 = a^2 + 2ab + b^2,$$
$$(a - b)^2 = a^2 - 2ab + b^2,$$
$$a^2 - b^2 = (a + b)(a - b).$$

The square on a side of a triangle is greater or less than the sum of the squares on the other two sides, according as the angle contained by those sides is obtuse or acute. The difference is twice the rectangle contained by one of the two sides and the projection on it of the other.

The Circle.

In equal circles (or, in the same circle) *(i.) if two arcs subtend equal angles at the centres, they are equal ; *(ii.) conversely, if two arcs are equal, they subtend equal angles at the centre.

In equal circles (or, in the same circle) *(i.) if two chords are equal, they cut off equal arcs ; *(ii.) conversely, if two arcs are equal, the chords of the arcs are equal.

If a straight line touch a circle, and from the point of contact a chord be drawn, the angles which this chord makes with the tangent are equal to the angles in the alternate segments.

If two chords of a circle intersect either inside or outside the circle, the rectangle contained by the parts of the one is equal to the rectangle contained by the parts of the other.

Proportion : Similar Triangles.

(Proofs which are only applicable to commensurable magnitudes will be accepted.)

If a straight line is drawn parallel to one side of a triangle, the other two sides are divided proportionally; and the converse.

If two triangles are equiangular, their corresponding sides are proportional ; and the converse.

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 similar.

The internal bisector of an angle of a triangle divides the opposite side internally in the ratio of the sides containing the angle, and likewise the external bisector externally.

The ratio of the areas of similar triangles is equal to the ratio of the squares on corresponding sides.

ELEMENTARY EXPERIMENTAL SCIENCE SYLLABUS FOR JUNIORS.

PART I.

The general properties of matter. Cohesion. States of matter—solid, liquid, and gaseous.

The distinctive properties of solids, including simple experiments on elasticity.

The distinctive properties of liquids. The water level. The characteristic properties of a gas.

The methods of measuring length, area, volume, and time. Experiments with the simple pendulum.

The principle of the lever and of the balance.

Determination of densities and specific gravities.

Experiments on flotation. Hydrometers.

The pressure of the atmosphere. The mercury barometer. The aneroid barometer. The action of a pump. The siphon.

The effects of heat on matter. Expansion. Temperature and its measurement. The use of various kinds of thermometers. Change of state. Fusion. Evaporation and boiling. Conduction of heat. Experiments on good and bad conductors. Heating by convection and radiation.

The simple laws of light. The formation of shadows. Reflexion of light. The properties of plane mirrors.

Refraction through a glass plate and through water. The bending of light through a prism. The properties of a convex lens. The dispersion and recomposition of white light. Colour.

Electrification by friction. The properties of magnets and of the electric current.

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* Proof of these theorems will not be required.

PART II.

Common laboratory operations, such as evaporation, crystallization, filtration, and distillation.

The changes that occur when substances are heated. The chemistry of air. Oxygen and nitrogen. Rusting and burning.

Qualitative examination of simple chemical changes.

The physical and chemical properties of water. Properties of hydrogen.

Properties of acids and alkalis. Neutralization, common salt, and saltpetre.

Carbon. Carbon dioxide, chalk, and lime.

At the practical part of the examination candidates will be asked to perform easy experiments on the above subjects.

CHEMISTRY SYLLABUS FOR JUNIORS.

Questions will be set requiring an elementary knowledge of the following subjects:—

The distinction between elements, compounds, and mixtures. Equivalent weights. The meaning of chemical equations. The law of definite proportions. The laws of Boyle and Charles. Crystallization and distillation, precipitation and filtration, and the use of these processes in the preparation of pure substances.

The air, its chief constituents; the effects of plants and animals on the air. Combustion. Oxidation and reduction.

Water, its evaporation and distillation; spring water, river water, sea water, hard water, soft water, rain water. The composition of water by volume.

The preparation and properties of hydrogen, oxygen, nitrogen, ammonia, nitrous oxide, nitrogen peroxide, nitric acid; chlorine, hydrochloric acid; carbon, carbon monoxide, carbon dioxide; sulphur, hydrogen sulphide, sulphur dioxide, sulphur trioxide, sulphuric acid.

The properties of sodium hydroxide, sodium chloride, sodium carbonate; calcium oxide, calcium hydroxide, calcium carbonate; lead, lead oxide, lead peroxide, red lead.

The characteristic properties of acids, alkalies, bases, and salts as illustrated by the substances mentioned above.

NOTE.—Candidates will be expected to perform simple calculations concerning the weights and gas volumes of reacting substances, but a knowledge of the atomic and molecular theories will only be required in so far as these theories are needed for the comprehension of chemical symbols, formulæ, and equations.

Practical Examination.

Candidates may be asked to observe the effect of heat and of reagents on substances supplied to them, to recognize the substances referred to in the above schedule, and to identify the solid or gaseous products of a reaction, so far as these products are amongst the substances mentioned in the above schedule. They may be asked to perform simple experiments illustrating the preparation, purification, and properties of these substances. They may also be asked to perform quantitative experiments such as the estimation of the loss or gain in weight of a substance on being heated in air, or the determination of the volume of a gas given off when a carbonate or a given weight of a metal is treated with an acid. Acidimetry and alkalimetry as involved in the use of standard solutions of sulphuric acid, nitric acid, sodium hydroxide, sodium carbonate.

[*The examination in Junior Practical Chemistry can be held only at centres at which a properly equipped laboratory is available for the purpose. Alternative questions will be set.*]

CHEMISTRY* SYLLABUS FOR SENIORS.

The distinction between elements, compounds, and mixtures. The laws of Boyle, Charles, Gay-Lussac, and Avogadro. The law of definite proportions. The meaning of chemical equations. Equivalent and atomic weights and the methods for their determination in simple cases only. Solution, crystallization, distillation, precipitation, and filtration, and the use of these processes in the preparation of pure substances.

The study of air and water. Oxidation and reduction. Combustion; the study of coal gas.

B. The chemistry of the following elements and of their chief compounds: hydrogen; oxygen; chlorine (and its relation to bromine and iodine); sulphur; nitrogen; carbon (including methane, ethylene, acetylene); sodium; calcium; iron; copper. (The details of the metallurgical processes will not be required.) The characteristic properties of acids, alkalies, bases, and salts as illustrated by the above substances.

Practical Examination.

The determination of equivalent weights. Preparations of the simpler substances mentioned in the above schedule. The study of the qualitative and quantitative results of the effect of heat on substances supplied. Qualitative analysis of simple salts of the commoner metals and acids.

Simple problems in volumetric analysis involving the use of standard solutions of acids, alkalies, and silver nitrate.

Alternative questions will be set, so that candidates will not necessarily be required to take the qualitative analysis.

PHYSICS SYLLABUS FOR JUNIORS.

The questions will be principally such as will test the Candidates' knowledge of the subject as gained from a course of experimental instruction.

HEAT.

Construction and use of common thermometers. The measurement of quantities of heat, of the specific heat of solids and liquids, of the latent heat of fusion of ice, and of the latent heat of steam. Coefficients of expansion, relations between the pressure, volume, and temperature of a gas. The dew-points, measurement of the saturation-pressure of aqueous vapour. Qualitative observations on the transmission of heat by conduction, convection, and radiation. The methods of production of heat. Transformation of work into heat.

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* This subject can be taken at those centres only at which a properly equipped laboratory is available.

Sound and Light.

The propagation, reflexion, and refraction of light; the formation of images by a plane, convex, or concave reflecting surface, or by two plane mirrors at an angle. Graphic methods of determining the position and the size of an image. The combination of two convex lenses to form a microscope or telescope. Dispersion, the combination of lenses and a prism to form a spectroscope.

The propagation and reflexion of sound, the experimental determination of the velocity of sound in air; the use of the tuning-fork, the determination of pitch. Experiments on the vibration of strings and of columns of air.

N.B.—Candidates should bring drawing instruments and a scale graduated in centimetres and millimetres.

Electricity and Magnetism.

Simple experiments on the magnetic properties of iron and steel, magnetic induction, comparison of the moments of magnets, comparison of field strength by means of a vibrating magnet.

The behaviour of electrified bodies, electrostatic induction. The electroscope and electrophorus.

Daniell and Leclanche cells. The magnetic, thermal, and chemical effects of currents. The tangent galvanometer, voltameters. Electromotive force, current, resistance. Ohm's Law.

Practical Examination.

Candidates will not be required to answer questions in more than two of the three subjects numbered (i.), (ii.), (iii.) *below.*

(i.) *Heat.*—Comparison of Fahrenheit and Centigrade scales, and testing the fixed points of a thermometer. Determination of specific heats by the method of mixture. Determination of latent heat of fusion of ice. Simple qualitative experiments to illustrate the laws of heat.

(ii.) *Sound and Light.*—Velocity of sound by resonace column. Experiments on tones emitted by stretched wires or strings. Experimental verification of the laws of reflexion and refraction. The use of prisms. Experiments with concave mirrors and convex lenses.

(iii.) *Electricity and Magnetism.*—Distinction between magnetized and magnetic substances. Mapping fields of magnetic force. Comparison of pole-strength. The use of the electroscope and electrophorus. Setting up simple cells. Comparison of currents, electromotive forces, and resistances by use of the tangent galvanometer. Deposition of copper by electrolysis.

PHYSICS SYLLABUS FOR SENIORS.

The questions will be principally such as will test the Candidates' knowledge of the subject as gained from a course of experimental instruction.

Experimental Mechanics.

Methods of measurement, the use of graphical methods.
Velocity, acceleration, resolution, and composition of velocities and accelerations.
Mass, momentum, the ballistic balance. Force. Motion under the action of a single force.
Weight, motion of falling bodies.
Work, energy, conservation of energy, power.
Composition and resolution of forces in one plane. Conditions for equilibrium of three forces.
Centre of gravity, equilibrium.
Moments of forces; couples.
Simple machines, velocity ratio of a machine, the principle of work.
Experiments on friction.
Distinction between solids, liquids, gases.
Pressure in liquids; floating bodies.
Determination of density and specific gravity.
Pumps, hydraulic press.
Pressure of gases, Boyle's law, atmospheric pressure.
Barometer, air pumps.

Heat.

Temperature and its measurement.
Calorimetry, specific heat of solids and liquids, latent heat.
Expansion of solids and liquids.
Relations between the volume, pressure, and temperature of a gas.
Change of state; fusion, determination of melting and boiling points, evaporation, ebullition, vapour pressure, dew-point, hygrometry.
Transmission of heat by conduction and convection.
Radiation, its propagation, its relation to light.
Mechanical equivalent of heat, its determination.

Sound and Light.

The propagation, reflexion, and refraction of light; photometry.
Measurement of index of refraction of solids and liquids.
Total reflexion.
Graphic methods of determining the position and size of an image formed by reflexion or refraction.
Measurement of local lengths of mirrors and lenses.
Deviation and dispersion produced by a prism. The spectrum. The colour of natural objects.
Optical properties of the eye; long-sight and short-sight, their correction.
Combination of two lenses to form a telescope or a microscope.
Production, propagation, and reflexion of sound.
Relation between the sound produced and the character of the vibrations.
Determination of pitch of tuning-forks, beats, experiments on the vibrations of strings and columns of air; resonance.
Experimental determination of velocity of sound in gases.
N.B.—Candidates should bring drawing instruments and a scale graduated in centimetres and millimetres.

Electricty and Magnetism.

Simple phenomena of magnetism. The earth as a magnet.
Experimental verification of laws of magnetic force.
Mapping of magnetic fields, comparison of moments of magnets, comparison of strength of field.
Simple phenomena of electrostatics, electrostatic induction.
Meaning of potential, distribution of charge, capacity.
The electroscope and electrophorus.
Production of electric currents, primary cells.
Magnetic effects of a current, galvanometers.
Chemical effect of a current, laws of electrolysis, secondary cells.
Ohm's Law. Resistance.
Comparisons of currents, electromotive forces, resistances.
Practical units of current, electromotive force, resistance ; specific resistance.
Heating effect of a current, Joule's Law.
Experiments to illustrate electromagnetic induction.

*Practical Examination in Physics.**

The examination will consist of simple experiments, chiefly of a quantitative character. Its scope will be as follows:—

Experimental Mechanics.—The measurement of lengths, areas and volumes ; the spherometer ; experiments on moving bodies ; the ballistic balance ; the simple pendulum ; experiments involving the graphical treatment of systems of forces ; the use of the balance ; machines ; the determination of coefficient of friction ; centre of gravity ; experiments involving the principle of Archimedes ; the determination of specific gravity and density ; the measurement of fluid pressure ; the barometer.

Heat.—The use of thermometers and the testing of their fixed points ; the determination of melting points and boiling points ; the determination of specific heat, capacity for heat and latent heat ; hygrometers ; the measurement of vapour pressure ; the expansion of solids, liquids, and gases ; gas thermomoters ; the rate of cooling of hot bodies.

Sound and Light.—Experiments on the reflexion of light at plane and spherical surfaces ; the measurement of refractive index ; thin lenses ; prisms ; the construction of the telescope, compound microscope and spectroscope. The velocity of sound in gases ; the notes emitted by stretched strings and wires.

Electricity and Magnetism.—The measurement of magnetic pole strengths and magnetic moments ; magnetic fields, and the measurement of field strength ; the use of the electroscope, electrophorus, and condenser ; galvanometers ; measurement of current strength and resistance ; the comparison of electromotive forces.

BOTANY SYLLABUS.

Introductory Observations.

The following biological principles which underlie the accompanying schedules may prove useful to teachers in their presentation of the subject to students:—

(i.) Any single plant growing in its natural habitat may be regarded as an efficient machine. It is made up of different parts performing different functions, thus exhibiting division of physiological labour.
(ii.) There may be many efficient types of plants growing in the same habitat. These may differ strikingly from one another in regard to single biological advantages, and yet be equally successful in regard to the sum total of their equipment for the struggle for existence.†
(iii.) Plants are efficient for life in very various habitats, and survive through wide ranges of seasonal change. In accomplishing this plants exhibit more or less striking adaptations to the external conditions in which they exist.

It is essential that the teacher should constantly keep in mind the importance of naked-eye work and of experiments performed by the students themselves on living plants. A simple lens and dissecting instruments will be found sufficient to enable the student to recognize such anatomical features as are essential for the appreciation of physiological processes.

The schedule prescribes the use of the microscope for Senior students, but it is not intended to discourage the use of the microscope for *demonstration* purposes in the case of Junior students when it is difficult for them to form a conception of structural features (*e.g.*, stomata, chloroplasts, &c.) which are too small to be seen satisfactorily under a simple lens.

It is very important that students should be taught to make, from specimens, drawings much larger in scale than the actual objects, and diagrammatic in treatment.

With a view to avoiding the danger, consequent on limitation of time, of attempting to hurry students through the longer courses of instruction, a choice of questions will be allowed in the Junior and Senior examinations.

In the examinations on the Junior and Senior schedules specimens (not necessarily confined to the families mentioned in the schedules) will be provided for description, and special weight will be given to this part of the examination. Students should bring a pocket lens and a dissecting instrument.

JUNIOR.

I.—The Morphology and Functions of Herbaceous Plants.

The examination of a common herbaceous Dicotyledon to illustrate the structure and functions of the root and shoot systems ; the distribution of vascular and mechanical tissues ; the origin and position of new members on roots and shoots ; and a comparison of the growing points of stems and roots. The root and shoot systems should be treated also from a biological point of view, showing how each is adapted in its mode of growth and arrangement of parts to carry out its physiological functions in the medium in which it lives.

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* This subject can be taken at those centres only at which a suitable laboratory and apparatus can be provided.

† It is a matter of common experience that a student finds it difficult to realize, on being taught that a plant has certain advantages—say, in possessing winged fruits—why other plants are not provided with the same efficient mechanism. This and similar difficulties may be met by an application of the ideas expressed in the principle stated above.

Students should take part in the performance of simple experiments illustrating the more important physiological functions of plants; respiration; transpiration; absorption; nutrition; etiolation, heliotropism, and geotropism, their biological importance.

Students should have an *elementary* knowledge of the chemical and physical properties of the atmosphere, soil and water.

II.—Arborescent Plants.

Comparison of the mode of growth, habit, and bark-characters of a few common trees: the examination of twigs of some common trees, including (for deciduous trees) comparison of their leafy and leafless stages and relation of latter to dry season. Knowledge of annual history of common trees, including time of producing young foliage, colour and habit of young foliage, time of flowering, and of ripening fruit. Observation of cauliflory of hanging roots (banyan tree), stilt roots, buttress roots, of the production of latex and useful fibre.

General characteristics of palms and bamboos contrasted with dicotyledonous trees.

III.—Comparative Morphology and Biology.

A comparison of a few selected plants to illustrate the principal forms of leaves and stems.

Examination of the distinctive characters and of the adaptations to different modes of life of the following series of biological types: grass, dicotyledonous herb, tree.

Adaptation to special habitats as illustrated by water plants and climbing plants.

Comparison of the different parts of plants in which food reserves are stored.

IV.—Flowers and Reproductions.

The student should not begin the study of flowers by learning the characteristics of various families. Flowers should, in the first place, be considered, like vegetative organs, from a biological point of view. Attention should be paid to features of biological interest in some common types of inflorescences, as well as to the functions and special morphology of the parts of the flower in relation to pollination and seed production. Attention should be paid to the importance of dichogany and other methods of insuring cross-pollination. Flowers of the following families* should be examined: Dilleniaceæ, Malvaceæ, Leguminosæ including Mimoseæ and Cæsalpineæ, Myrtaceæ, Rubiaceæ, Compositæ, Convolvulaceæ, Scrophulariaceæ, Amaryllidaceæ, Commelinaceæ.

Different types of seeds and fruits should be examined with special reference to seed dispersal.

V.—Biological Types and Life Histories.

Knowledge of characteristics of the following biological types:—

Epiphytes.—Including Orchids, Ferns, Araceæ, Ficus, Clusia, their various adaptations for their habitat.

Parasites and Semi-parasites, e.g., Cuscuta, Cassytha, Loranthaceæ, Rhipsalis.

Xerophytes, e.g., Euphorbia, Sansevieria, Casuarina, Prosopis, Cactaceæ.

Insectivorous plants, e.g., Nepenthes, Drosera, Utricularia.

Hydrophyles, e.g., Nymphæa, Eichhornia, Heteranthera, Trapa, Sagittaria, Pistia.

The part played in the life of the plant by seeds, bulbs, tubers, and other structures adapted for food storage and for vegetative reproduction.

Students should themselves grow suitable seeds in order to study the germination of different types of seedlings.

It is desirable, when circumstances permit, that excursions into the country should be arranged to enable students to observe the plants of different classes of habitats.

SENIOR.

I.—The Morphology and Functions of Herbaceous Flowering Plants.

The microscope should be used, at the discretion of the teacher, for the examination of organs the function of which it is difficult to understand without some knowledge of their microscopic structure.

An examination of a Dicotyledon and Monocotyledon to illustrate the structure and functions of the root and shoot systems; the distribution of vascular and mechanical tissues; the origin and position of new members on roots and shoots; and a comparison of the growing points of stem and root. The root and shoot system should be treated also from a biological point of view, showing how each is adapted in its mode of growth and arrangement of parts to carry out its physiological functions in the medium in which it lives.

Students should themselves perform simple experiments illustrating the nature of soils and the more important physiological functions of the plant, including the simpler manifestations of irritability as exhibited by the movements of leaves, stems, and roots. Special prominence should be given to this experimental work.

II.—Arborescent Plants.

A comparative study of common trees (dicotyledons and monocotyledons, including palms, pandanus, bamboos, dracæna) as regards habit, external morphology, forms of leaves, &c.

Secondary thickening; its significance in relation to the increase in leaf-area and root development; rings in wood, whether dependent on season or not, in what trees present and in what absent, what changes in nature of wood produce them; heartwood and sapwood.

III.—Comparative Morphology and Biology.

Simple comparative morphology of leaf and stem.

Examination of the distinctive characters and of the adaptations to different modes of life of the following series of biological types: grass, dicotyledonous herb, tree.

Adaptation to special habitats as illustrated by water plants and climbing plants.

Comparison of the different parts of plants in which food reserves are stored.

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* The above list is intended to suggest suitable material for use in the study of the morphology of the flower; candidates are not expected to learn the characters of the families. If any of the orders named above cannot be obtained, teachers should use their discretion in substituting other orders, which should resemble as nearly as possible the orders for which they are substituted as regards the principal points which they illustrate.

IV.—Flowers and Reproduction.

The morphology and natural history of the flowers of the following families: Dilleniaceæ, Malvaceæ, Aurantiaceæ, Leguminosæ including Mimoseæ and Cæsalpineæ, Myrtaceæ, Cucurbitaceæ, Rubiaceæ, Compositæ, Convolvulaceæ, Acanthaceæ, Scrophulariaceæ, Amaryllidaceæ, Palmæ, Gramineæ.

The attention of the student should be drawn to the general uniformity of plan that prevails among flowers, and to the variations in the relations of parts characteristic of different families.

Students should be taught to construct floral diagrams, and to make drawings of longitudinal sections of flowers.

Cross-pollination, self-pollination, and their mechanisms.

The general morphology of fruits and seeds and the methods of dispersal.

V.—Biological Types and Life Histories.

More extended study of the characteristics of the biological types in the Junior Syllabus, with the addition of mangroves, sensitive plants, *e.g.*, mimosa, &c.

The part played in the life of a plant by seeds, bulbs, tubers, and other structures adapted for food storage and for vegetative reproduction.

Students should themselves grow suitable seeds in order to study the germination of different types of seedlings.

The seedlings studied should always include cocos or some other common palm.

NATURAL HISTORY OF ANIMALS.

Introductory Observations.

The formative value of Natural History lies (1) in encouraging a habit of observation, (2) in developing the power of comparison and the habit of looking for reasons for the differences between things. The teacher should therefore take care (1) that the animals, so far as possible, be seen, handled, and watched alive by his pupils, who should especially be warned that imagination is no substitute for observation in regard to the habits of the creatures; (2) that the connection between the bodily structure of each animal and its mode of life be pointed out. It is well to bear in mind also that things shown are more easily understood and make a more permanent impression on the mind than things merely told.

So far as possible simple English names for the objects of instruction should be used, both because they are more easily understood and remembered, and because the use of unfamiliar names, which must be committed to memory by an effort, is apt to give a distaste for the subject. Marks are often lost by misuse of the Latin names of things which have a well-known English name, as, for instance, the word *sternum*, which is sometimes misapplied, whereas "breastbone" cannot be.

(This should not preclude the learning of the Latin as well as the English names of animals, such as butterflies and birds, of which a collection is made and classified.)

It is not expected that students will cover the whole schedule. In section 1 it will be well to begin with the human skeleton and its relation to the external form of the body; instruction on the teeth should be given, but details of the skull, the wrist, and the ankle may be omitted. With the aid of pictures or diagrams an *outline* of the internal anatomy and physiology can then be given. In teaching the several mammals named in the schedule, it will be well to compare the general shape of the body, the teeth, and the bones of the hands and feet with those of Man—in many ways, physically, a primitive and generalized type. Books can be used for the foreign species, and visits to a zoological garden will be useful. British mammals should be studied alive if possible.

In section 2 the skeleton of a fowl or pigeon should be studied, but both here and in section 6 formal lessons should not be given on those parts of the subject which students will learn better by personal observation and collecting or photographing. Lectures on such subjects as warning and protective colouration will be of value. Many of the aquatic forms can be well observed in an aquarium. Insects should be reared when this is possible, and in the case of all the animals every opportunity should be taken of observation in the field.

The Syndicate are prepared to recommend text books to teachers. Application may be made to the General Secretary.

NATURAL HISTORY OF ANIMALS SYLLABUS FOR JUNIORS.

1. The general structure of a mammal and an elementary knowledge of the functions of its chief organs.

The more important characteristics, as regards form and habits, of the following mammals:—Monkeys, Bats, Moles, Hedgehogs, Carnivores, Ungulates, Whales, Rodents, Marsupials.

2. The external features of a Bird, and such details of anatomical structure as are connected with the power of flight.

The principal diversities in external form and habits characteristic of the main groups of Birds.

The eggs, nesting and singing habits, and migration of common British species.

3. The external features, life history, and habits of a Frog.
4. The external features and mode of life of a Fish.
5. The external features and mode of life of a Snail, a Cockroach, and an Earthworm.
6. The life history of a Moth or Butterfly.

The distribution and habits of the better known British species of Moths and Butterflies.

Elementary questions may also be asked with regard to very common insects of other orders.

Students will not be expected to cover the whole schedule, and the paper will contain more questions than the candidates are allowed to answer. Importance will be attached to evidence of personal observation on the part of the candidates.

NATURAL HISTORY OF ANIMALS SYLLABUS FOR SENIORS.

Questions of a more advanced nature on the subjects of the Junior Schedule, and in addition on the following subjects:—

7. The external form, habits, and life history of the common Indian species of Insects, Fishes, Amphibians, Reptiles, and Mammals.
8. The external form and habits of the Jellyfish *Aurelia*, a Sea Anemone, a Mussel, a Crab, a Starfish.
9. The external form and habits of *Hydra*, the Horse-leech, the Pond-mussel, the Crayfish, a Spider.

Students will not be expected to cover the whole schedule, and the paper will contain more questions than the candidates are allowed to answer. Importance will be attached to evidence of personal observation on the part of the candidates.

AGRICULTURAL SCIENCE SYLLABUS FOR SENIORS.

The schedule for this subject is divided into two parts, on each of which a paper will be set. The first part is concerned chiefly with the applications of chemistry and physics to the problems of the growth of crops, and the second part with the biology of farm crops and weeds. The schedule is written in the order in which experience has shown that the subject is most readily taught.

Part I.

Questions will be set so as to test whether the candidates have studied the subject experimentally in the Laboratory.

Plants in growing increase in weight. The substances of which this increase is made must come from the plant's surroundings, that is to say, from the air and from the soil. The decomposition of plants by heat into water, carbon dioxide, and ash. The composition of the air. The preparation and properties of oxygen and nitrogen. Elements. Mixtures. The combustion of carbon. Carbon dioxide, its preparation and properties, its presence in the air, and its relations to plant and animal life. The composition of water. The preparation and properties of hydrogen. Chemical compounds. Symbols. Formulæ. The physical properties of water, evaporation, freezing, latent heat, specific heat, and their bearing on the temperature of the soil. Water vapour in the air, rain, dew. Water as a solvent. Substances dissolved out of the soil by water and their relation to plant ash. The absorption of water by roots. Sand, clay, and humus in the soil: their physical properties, and their influence on the water content of the soil. The movement of water in the soil: how it can be controlled by such cultural operations as ploughing, harrowing, rolling, and hoeing.

The action of metallic calcium on water. Combustion of metallic calcium. Calcium oxide, hydroxide, carbonate. Quick lime, slaked lime, chalk, limestone, marble.

Sodium and potassium hydroxides. Magnesium and magnesium oxide. Iron and ferric oxide. Bases. Alkalis.

Preparation of ammonia from vegetable substances. Preparation and properties of ammonia. Composition of ammonia. Nitrogen in the plant.

Combustion of carbon, sulphur, phosphorus: carbon dioxide, sulphur dioxide, phosphorus pentoxide, their properties and relations to the corresponding acids.

Preparation and properties of sulphuric, nitric, and hydrochloric acids. Their composition and common reactions. Chlorine.

General properties of acids. Their neutralization by alkalis to form salts. Preparation of potassium nitrate and ammonium sulphate from acid and alkali, and ferrous sulphate from metal and acid. Equivalents of magnesium, zinc, aluminium, by dissolving metal in hydrochloric acid, and measuring volume of hydrogen evolved. Composition by volume of hydrochloric acid gas. Molecules. Atoms.

Monovalent, divalent, and trivalent elements. Reactions of iron, aluminium, calcium, magnesium, potassium, sodium, ammonium in simple salts. Reaction of carbonates, silicates, nitrates, chlorides, sulphates, phosphates. Formulæ and classification of the above simple salts of these metals.

Qualitative analysis of plant ash and comparison with the soil. The plant's chief requirements from the soil—nitrogen, phosphates, potash, and lime. Composition of soil water, and absorption of food salts from soil by plant. Common manures containing nitrogen, phosphates, potash, and lime. Their occurrence, manufacture, and use simply considered, their composition and availability.

The more striking effects of manures on crops. The circulation of carbon, nitrogen, phosphates, and potash from soil to plant, plant to animal, animal to soil, in the ordinary course of farm practice. Farmyard manure. The causation and importance of the changes in the state of combination of nitrogen between the time it leaves the animal and its subsequent utilization by the plant. The broad outlines of the chemistry and physics of the building up processes which go on in plants, and of the breaking down processes which go on in animals.

Part II.

Questions will be set so as to test whether the candidates have made themselves familiar with the crops and weeds of their own country, as defined in the following schedule.

Structure of seeds. Recognition of common agricultural seeds and their chief impurities. The germination of seeds of the Leguminosæ, Palmæ, and Gramineæ. Conditions necessary for the germination of seeds. Vitality of seeds. Methods for testing the purity and germinating capacity of seeds.

Buds of various kinds and their structure. Recognition of common trees by bud characters. Fruiting spurs. Pruning. Methods of grafting and budding. Propagation by means of layers and cuttings. The vegetative propagation of weeds.

The development of the shoot system: rhizomes, tubers, corms, and bulbs. Climbing stems. The development of the root system: root tubers and adventitious roots. Root range. The secondary thickening of woody stems and of fleshy roots as seen with a pocket lens.

The leaf: its structure and chief modifications.

The inflorescence.

The structure of the flower in the following families: Cucurbitaceæ, Malvaceæ, Leguminosæ, Palmæ, Compositæ, and Graminaceæ.* Pollination. Development of the chief types of fruits. The distribution of fruits and seeds as illustrated by local weeds. The weed flora of arable and pasture land. The extermination of weeds.

The essential food materials of plants. Osmosis: plasmolysis and the effects of an excess of soluble salts on the plant. The conduction of water and of salts in solution through the plant: the disposal of the excess of water. The phenomena of wilting: conservation of water supply under dry conditions. The assimilation of carbon. Composition and properties of starch, sugar, fats, oils, and proteins. Tests for these substances in plant tissues and in feeding cakes. Storage of food and its utilization during the germination of seeds, and the sprouting of tubers and bulbs. Growth; the effects of temperature, light, and food supply on the rate of growth. Respiration.

HYGIENE SYLLABUS FOR JUNIORS.

Air and Ventilation.—The composition of air; simple methods of detecting oxygen, carbon dioxide and water vapour in air; quantity of fresh air required for each person; impurities in air; sewer gas; effect of occupants on air of rooms; overcrowding; effects on air of various methods of warming and lighting; fresh air as food, bad air as poison; special importance of fresh air in connection with tuberculosis; natural and artificial methods of ventilation.

Water.—Quantity of water required for each person; sources of water supply, *e.g.*, rain-water, springs, wells, rivers, and upland surface waters; sources of impurities; filters; hard and soft waters; methods of softening hard waters; action of soft waters on lead pipes; water as a carrier of disease.

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* Colonial candidates may substitute families of special economic importance in their own countries in place of the families named above.

Foods.—Classification of foods; nature, relative values and importance of the chief constituents of foods; various foods, *e.g.*, meat, milk, bread, cheese, vegetables, fruits, cereals, fats, sugar, tea, coffee, cacao, tinned foods; the outlines of the chemistry of digestion and absorption; excretion; overfeeding and underfeeding; unwholesome and unpunctual feeding; effects on foods of roasting, boiling, stewing, and baking.

Drainage.—Removal of dry refuse; dry earth closets; flush systems; traps; influence on health of defective drains.

Personal hygiene.—Breathing; rest and exercise; washing and bathing; use and action of soap; care of teeth; relative hygienic values of cotton, linen, wool, and silk clothing; change of clothing and bedding.

Simple facts concerning common infectious diseases; mosquitoes, flies, and fleas as carriers of disease; value and use of common disinfectants, *e.g.*, Condy's fluid, bleaching powder, carbolic powders and solutions, sulphur dioxide.

Burns and scalds; cuts; sprains and fractures.

SPECIMEN PAPER IN HYGIENE (JUNIOR).—*Two hours.*

(*Only six questions may be attempted.*)

1. Into what classes are foodstuffs divisible and what are their respective functions? Compare the food values of meat, bread, and cheese.
2. Explain how you would heat and ventilate a room without causing a draught.
3. What are the precautions necessary to secure a supply of pure drinking water from a well? What diseases may be propagated by drinking bad water?
4. What materials are used for clothing? Mention the advantages and disadvantages of each kind of material.
5. Of what does house refuse usually consist? How is it generally disposed of in a town and in the country?
6. Why is cleanliness of the skin and the teeth essential to health?
7. What is the distinction between a simple and a compound fracture?

What treatment would you apply to a fractured arm until a doctor arrived?

HYGIENE SYLLABUS FOR SENIORS.

Air.—The composition of air; methods of detecting the various gases in air; impurities in air; methods of detecting impurities in air; trade processes which pollute air. Elements of hygrometry.

Ventilation.—Diffusion of gases; direction of air currents; quantity of fresh air required; natural and artificial ventilation; good and bad systems; methods of warming and lighting rooms and houses, and their influence on ventilation.

Water.—Domestic supply; quantity of water required for each person; methods of collection and distribution of water; sources of impurity; methods of detecting impurities; effects of insufficient, or impure supply; methods of purification of water; filters; hard and soft waters; estimation of hardness; action of hard and soft water on lead pipes; simple methods of estimating the organic and inorganic substances dissolved in water.

Foods.—Classification of foods; the nature and importance of their chief constituents; proteins, carbohydrates, fats, salts; the chemistry of digestion and absorption; excretion; sound and unsound foods; causes and effects of unsound food; common adulterations and methods of detection; microscopic examination of foods; action of moulds and ferments on foods; fermentation; alcohol; alcoholic liquors; simple methods of estimating the chief constituents of foods.

Drainage.—Good and bad systems of domestic drainage; traps; effects of bad systems; testing of drains (smoke test, water test); removal of dry refuse; outline of methods of sewage disposal.

Personal hygiene.—Rest and exercise; respiration; washing and bathing; care of the teeth; soaps; clothing material; microscopic examination of fibres; action of soaps, acids and alkalis on fibres.

Infection, Disinfection.—Common disinfectants and antiseptics; their use and action; simple facts concerning common infective diseases.

Geological features in relation to health; soils and subsoils; ground-air and ground-water; composition of ground-air; water and organic matter in soil.

DOMESTIC SCIENCE SYLLABUS FOR SENIORS.

Questions will be set on the following schedule, and will involve a knowledge of Elementary Physics and Chemistry:—

A.

Outline of the structure of the Human Body.
Nature of protoplasm and protein.
Physiology of the Human Body.

(1) The digestive system.
Digestion and absorption, the structure and the care of the teeth.
(2) Excretion.
The kidneys, the structure of the skin.
(3) The respiratory system.
(4) The vascular system and the heart.
Healthy and unhealthy conditions of the blood.
(5) The outlines of the muscular and nervous systems.

B.

(1) Choice of site and aspect of houses.
(2) The theory of ventilation; systems of ventilation (outlets for air in roofs, clearance of jungle, &c.); cooling and lighting of rooms and buildings; drainage (surface and underground); conservancy (water carriage, dry-earth system, cesspits).
(3) Domestic water supply; hard and soft water; the pollution and purification of water.
(4) Foods and beverages; their classification; the nature and importance of the chief constituents; the changes effected by the cooking of foods; adulteration of foods; the action on foods of moulds and ferments.
(5) Personal hygiene; rest and exercise; washing and bathing; clothing.

(6) Infection, disinfection; simple facts concerning infective diseases common in the tropics, with special attention to such disease carriers and parasites as mosquitoes, flies, fleas, and worms.

(7) The influence of climate and weather on health.

The questions will be set in such a form as to test whether the candidates have studied the subject experimentally. The answers of candidates must show knowledge of local conditions.

NEEDLEWORK.

Note.—Principals of girls' schools who propose to enter pupils for examination in sewing at the Junior or Senior School Certificate Examination in December are required to send in to the Inspectress of Needlework in January of the preceding year (*i.e.*, two years beforehand) a list of the names of such pupils.

The Inspectress of Needlework will pay visits (without notice) periodically for the purpose of reporting on the progress of these pupils, and the teacher's record must be ready for inspection along with the work of each pupil. On November 30 all the finished garments must be in the hands of the Inspectress of Needlework.

Candidates must bring with them to the Practical Examination a ruler, red and blue pencils, cotton, needles, pins, a thimble, scissors, and a tape measure; and to the question paper a ruler and a pencil.

NEEDLEWORK SYLLABUS FOR JUNIORS.

Practical Examination.

(1) *Dealing with raw edges* of calico and flannel: hemming; herring-boning; binding; applying false hems.

(2) *Joining materials:* top-sewing and felling (pillowcases and longcloth under-garments); running and felling fine under-clothing); running and herring-boning (flannel shirts); running and binding (flannel outer garments); "French" seams (cotton outer garments).

(3) Tucking; gathering; buttonhole making; darning holes and thin places in stockings; patching holes in calico, print, and flannel garments (no seams to be involved, the work to be limited to the mending of holes in places where unpicking of the garments is not necessary).

(4) To make a chemise (showing gathers), a child's sleeping suit, and a child's frock (showing tucks). No candidate will be allowed to take the examination who has not completed these garments.

To know how to place the different parts of a pattern in the proper positions on the material; and to plan with a view to economy in cutting out.

NEEDLEWORK SYLLABUS FOR SENIORS.

Practical Examination.

I. *Hand Sewing.*—As for Juniors (1), (2), and (3), also—

(4) Strengthening the ends of seams with gussets and tapes; patching holes under the arms in garments, and replacing torn corners of towels; darning rents in coats or woollen dresses, thin places and diagonal cuts in table linen; making whipped frills.

(5) Cutting out exercises: a chemise; a combination garment; yokes; sleeves; cuffs and collars for shirts; yokes and sleeves for nightgowns and frocks.

II. *Machine Work.*—(*a*) To use and keep in order a sewing machine.

(*b*) To cut from given patterns and put together a girl's frock, a boy's tunic suit, a woman's blouse and skirt.

Written Examination.

A knowledge of the comparative values of cotton, linen, and wool, as materials for clothing; the uses to which each is put; prices; approximate quantities required for common articles of dress or household linen.

SPECIAL SENIOR CERTIFICATE FOR CEYLON.

A special certificate will be awarded by the Cambridge Syndicate under conditions specially approved for Ceylon open to those Senior students not offering one of the subjects 5 to 12 (languages) in the foregoing syllabus.

The examination in each subject will be identical with that for the Cambridge Senior School Certificate, but the subjects will be arranged in the following groups (I. to IV.), and to obtain the certificate a candidate must pass in two of the three subjects in Group I., in the whole of Group II., and in two subjects in Group III. If a candidate does not satisfy the Examiners in one of the subjects 13 to 17 in Group III., he must pass in Arithmetic in addition to two of the subjects 4 (Geography, if not taken under Group I.), 18, 19, 20, and 21.

For girls, the requirements in Group I. and Group II. are the same as for boys. They should also pass in one subject in Group III., and in one of the three subjects—Drawing, Needlework, and Music—in Group IV., provided that every candidate passes in Arithmetic.

Group I.

(*a*) Religious Knowledge (subject 1).

(*b*) History (subject 3).

(*c*) Geography (subject 4).

GROUP II

(*d*) English (subject 2), viz. :—(i.) Essay.
(ii.) Language.
(iii.) Literature (three prescribed books).

GROUP III.

(*e*) Mathematics (subject 13), viz. :—(i.) Arithmetic.
(ii.) Geometry.
(iii.) Algebra.

(*f*) More Advanced Mathematics (subject 14).
(*g*) Applied Mathematics (subject 15).
(*h*) Chemistry (subject 16).
(*j*) Physics (subject 17).
(*k*) Botany (subject 18).
(*l*) Natural History of Animals (subject 19).
(*m*) Geography (subject 4).
(*n*) Agricultural Science (subject 20).
(*o*) Domestic Science (subject 21).

GROUP IV.

(*p*) Logic (subject 22).
(*q*) Bookkeeping (subject 23).
(*r*) Mensuration and Surveying (subject 24).
(*s*) Shorthand (subject 25).
(*t*) Drawing (subject 26).
(*u*) Music (subject 27).
(*v*) Needlework (subject 28).
(*w*) Hygiene (subject 29).

Note.—It will be seen that the examination for this special certificate is only intended for candidates who do not wish to take any other language besides English. It should be further noted that this special certificate may not at present entitle the holder to any special exemptions, which will be a matter for subsequent decision by the bodies granting such exemptions.

SPECIAL CONDITIONS FOR ADULT PRIVATE STUDENTS.

Applications from adult private students for permission to take up the examination prescribed by the Syndicate must be received by the Director of Education not later than May 1, 1921.

Applications for entry forms from candidates who are allowed to take the examination as private students should be made during the first week in June, and these entry forms must be forwarded to the Director of Education so as to reach him not later than June 30, 1921. Each entry form must be accompanied by—

(1) Bank receipt for the fee (*vide* page 1 of this syllabus) credited to the account of the Director of Education in the Mercantile Bank of India, Ltd., Colombo.

(2) The letter granting permission to take the examination.

EXEMPTIONS.

[*The Syndicate do not hold themselves responsible for any error caused by changes in requirements with which they have not been made acquainted. Students are referred to the published regulations of the respective Institutions.*]

A.—THE UNIVERSITY OF CAMBRIDGE: PREVIOUS EXAMINATION.—A candidate in the Senior School Certificate Examination is entitled to exemption from the whole or parts of the previous examination as follows :—

(1) From the whole of the previous examination if the candidate has gained a certificate and passed with credit, either in five of the subjects 1–30, one of the five being Latin or Greek ; or in four of the subjects 1–30, including one at least from each of the Groups I., II., III., one of the four being Latin or Greek.

For the purpose of the above exemptions a Senior Certificate may be taken to include any Supplementary Senior Certificate which the candidate may obtain.

(2) From Part I., if the candidate has at one and the same examination obtained a Pass with Credit in Latin and in either Greek or French or German or Spanish.*

A candidate who qualified for exemption from the additional subjects in French or German before April 1, 1919, may be admitted to take the papers in Latin alone in Part I. of the previous examination.

(3) From the papers on Mathematics in Part II., if the candidate has at one and the same examination obtained a Pass with Credit in Arithmetic, in Geometry, and in Algebra ; and, in addition, (*a*) from the English Essay if the candidate has at the same or some subsequent examination obtained a Pass with Credit in English Composition, (*b*) from the paper on Paley's *Evidences* and its substitutes if the candidate has at the same or some subsequent examination obtained a Pass with Credit in Religious Knowledge or in Chemistry or in Physics.

Students desirous of obtaining exemption from Part I. or Part II. of the previous examination may, whether they already hold the certificate of the Syndicate or not, enter for those subjects alone that are required for the purpose.

The examination in the additional subjects has been discontinued, and candidates for a tripos are no longer required to have passed or gained exemption from that examination.

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* A student who being a native of Asia or Africa, and not of European descent, has obtained a Senior certificate, passing with credit in (*a*) English Composition and English Literature and (*b*) Latin, or Arabic, or Chinese, or Persian, or Sanskrit, or Sinhalese, or Tamil will be excused from Part I.

A student who being a native of Asia or Africa, and not of European descent, has obtained a Senior certificate, passing with credit in English Composition and English Literature will be excused from Part I. with the exception of the papers in Arabic, or Chinese, or Sanskrit, or Pali.

CAMBRIDGE SCHOOL CERTIFICATE EXAMINATIONS, 1921.—CEYLON CENTRES.

Time Table.

Except in Religious Knowledge for Seniors, no Student can take two Papers included in the same bracket.

N.B.—Students will not be allowed to bring any books, maps, manuscripts, &c., *within the precincts of any building* in use for these examinations. *This rule will be rigidly insisted on.*

Special attention is called to the following rule as to Drawing:—*In Freehand and Model Drawing no measuring is allowed, nor may Students rule any of the lines. This does not preclude holding a pencil between the eye and the model to ascertain proportions.*

Breach of either of these rules will involve immediate expulsion.

Monday, December 12.

8—9 Geom. Drawing J*

8—9½ { Trigonometry J / Memory Drawing S*

8—10 { Advanced Mathematics I. S / Greek II. S* / Music S

9½—10 Dictation J†

10—11 { English Essay J / English Essay S

12—1½ Gospel J

12—3 { (a) Gospel S / (b) Acts S / (c) II. Kings S / (d) Old Testament History S / (e) Epistles S*

Two papers may be taken, but not both (c) and (d); those taking one only must take it at 12 noon.

1½—3½ { Latin II. J / **Needlework (Prac.) J** / Electricity, &c., J*

3½—5½ { **Practical Physics S** / Sinhalese II. J / Tamil II. J

Tuesday, December 13.

8—10 { English Authors J / English Authors S

10—11½ Shorthand S

10—12 { Mensuration and Surveying S / **Needlework I. (Prac.) S**

10—12½ Latin I. S

1½—3½ { English Language J / English Language S

3½—5½ { Exp. Science I. J / Theoretical Chemistry J / Greek II. S* / Bookkeeping S*

4—6 { **Practical Chemistry S**

Wednesday, December 14.

8—10 { Arithmetic J / Arithmetic S

10—11½ { English History J / British Empire J / Roman History J

10—12 { English History S / British Empire S / European History S / Roman History S / Greek History S

1—2 { Memory Drawing J*

1—3 { Mechanical Drawing J / Latin I. J / French S / French S — alternative Syllabus (Direct Method) / Dutch S

3—5 { Logic S / Theoretical Chemistry S / Agricultural Sc. I. S

3½—5½ **Practical Physics J**

Thursday, December 15.

8—10 { Geometry J / Geometry S

10—11½ { II. Kings J / Old Testament History J / Acts J / Catechism, &c. J

10—12 { Sinhalese II. S / Tamil II. S

1—2½ Geography J

1—3½ Geography S

3—5 { Exp. Science II. J / Natural History J / Hygiene J / **Practical Chemistry J*** / Physics I. S / Natural History S / Agricultural Sc. II. S / Design S

Friday, December 16.

8—10½ Algebra J

8—10 Algebra S

10—11¼ Freehand Drawing S

12¼—1¼ { Model Drawing J‡

12¼—1¼ { Model Drawing S‡

1½—3½ { Greek I. J / Heat J* / Bookkeeping J* / Design J / Music J*

1¾—3¼ { Needlework II. S

1¾—3¾ { Latin II. S / Mechanical Drawing S

3¾—5¼ { Epistles S* / Common Prayer S / Catechism, &c. S

3¾—5¾ { Mechanics J / Physics II. S

Saturday, December 17.

8—9 Geometrical Drawing J*

8—10 { German J / Spanish J / Heat J* / Sinhalese I. J / Tamil I. J / German S / Spanish S

8—10½ Greek I. S§

10½—12½ { Botany J / Bookkeeping J* / **Practical Chemistry J*** / Electricity, &c. J* / Advanced Mathematics II. S / Botany S / Bookkeeping S*

1½—2½ Memory Drawing J*

1½—3 Memory Drawing S*

1½—3½ { Greek II. J / Sound and Light J / Music J* / Applied Mathematics S / Perspective Drawing S / Hygiene S / Domestic Science S

1½—3½ **Experimental Science III. (Prac.) J**

3½—5½ { Sinhalese I. S / Tamil I. S

4—5 Freehand Drawing J

* Alternative papers are set in these subjects; candidates must take the paper on the day for which they enter for it in their forms of entry.

† Students will not be allowed to make a fair copy of their Dictation paper; they must give to the Examiner the paper which they write from his dictation.

‡ If at any centre the number of Junior candidates entered for Model Drawing is larger than can be conveniently accommodated at one and the same time, the Presiding Examiner will be at liberty to fix some other time for certain of the candidates. Of this due notice will be given by the Presiding Examiner to the candidates concerned.

§ Candidates may take Greek and either German or Spanish, if they so desire. Application should be made to the Director of Education before May 1, 1921.

H. R. COTTLE, GOVERNMENT PRINTER, COLOMBO, CEYLON.