



SUPPLEMENT

TO THE

NEW ZEALAND GAZETTE

OF

THURSDAY, FEBRUARY 15, 1912.

Published by Authority.

WELLINGTON, FRIDAY, FEBRUARY 16, 1912.

The Education Act, 1908.—Examination and Classification of Teachers.

ISLINGTON, Governor.

ORDER IN COUNCIL.

At the Government Buildings, at Wellington, this thirteenth day of February, 1912.

Present:

THE RIGHT HONOURABLE SIR J. G. WARD, BART., PRESIDING IN COUNCIL.

IN exercise and pursuance of the powers and authorities vested in him by the Education Act, 1908, His Excellency the Governor of the Dominion of New Zealand, with the advice and consent of the Executive Council of the said Dominion, doth hereby make the regulations for the examination and classification of teachers set forth in the Schedule hereto; and, with the like advice and consent, doth prescribe that this Order shall come into force on the first day of June, one thousand nine hundred and twelve; and that on the same date the regulations for the examination and classification of teachers made by Order in Council of the twenty-sixth day of November, one thousand nine hundred and six, shall be revoked.

SCHEDULE.

REGULATIONS.

CERTIFICATES: GENERAL CONDITIONS.

1. CERTIFICATES shall be of five classes, based respectively on evidence of mental training and attainment, and distinguished, from the highest to the lowest, by the letters A, B, C, D, and E; but no certificates of Class E shall hereafter be issued except to teachers that have already passed the examination in Class E under former regulations, or obtained an equivalent.

2. The division of a certificate within the class shall, subject to the provisions of clauses 5 and 6 hereof, depend—first, on the number of years during which the teacher has been actually engaged in school-teaching, one mark being assigned for two years' service, two marks for five years, three marks for eight years, and four marks for eleven years and upwards; and, secondly, on the judgment of an Inspector, such judgment being expressed by marks numbering 2, 4, 6, 8, or 10, according to the Inspector's estimate of less or greater efficiency; and, the marks of both series being added together, fourteen marks shall qualify for the first division, eleven marks for the second, eight marks for the third, five marks for the fourth, and three marks for the fifth. In assigning marks for efficiency the Inspector will use the number "2" as a substitute for the lowest, and the number "10" as a substitute for the highest, term in a series of terms beginning with "tolerable" and ending with "excellent"; and an Inspector may put "0" in the place of a number to indicate that he considers the candidate to be incompetent.

3. Marks for efficiency shall be given only by the Inspector in whose district the teacher is at work, provided that the Inspector-General of Schools may assign marks for efficiency, not exceeding four, to teachers whose practical skill is sufficiently attested by certificates granted by authorities acting outside the Dominion of New Zealand, and that he or any other Inspector of the Education Department may also assign marks to teachers in schools inspected by him.

4. On the thirtieth day of June in each year teachers who by length of service, or upon a more favourable judgment expressed by the Inspector before the thirty-first day of May, shall have become entitled to promotion to a higher division shall receive such promotion.

5. Except as hereinafter provided, no teacher shall be classified until he has taught for two years in a school or schools subject to inspection under the Education Act, and having an average attendance not lower than that of a public school of Grade 1, nor until he has been assigned at least two marks for practical skill in teaching. No teacher shall be placed in Division 2 until he has had an experience of at least eight years as a teacher in such a school, and no teacher shall be placed in Division 1 until he has shown, to the satisfaction of the Inspector, ability to take charge, as head teacher, of a school with more than 150 children in average attendance; and the mark "10" shall not be given unless the Inspector is satisfied that such ability has been shown; but the teacher need not have been actually in charge of such a school. For the purpose of this clause an approved course in a training college for teachers shall count as ordinary service of equal length, and a period of pupil-teacher service as service of half its length. Service as a probationer shall not be reckoned.

6. Notwithstanding anything in the preceding clause, the Inspector-General of Schools, on the production of sufficient evidence, may, to a more or less limited extent, grant recognition to a period of service in schools other than those indicated therein; and the value to be attached to such service shall be determined by him, in his discretion, as occasion may arise.

EXAMINATION REQUIREMENTS.

7. (1.) The requirements for Class D are set forth in clauses 22 to 33 and in clause 59 hereof.

(2.) The requirements for Class C are set forth in clauses 34 to 48 and in clause 60 hereof.

8. The examination requirements for Class B shall be held to be satisfied as follows:—

(i.) In the case of a candidate who is not the holder of a Class C certificate, if he passes the examination for a Bachelor's degree in the University of New Zealand, together with an examination as required for Class C in Drawing, Elementary Hygiene, Methods of Teaching, and the Principles and History of Education;

Provided that a candidate shall not be required to sit again for examination in any of the subjects herein mentioned if it has formed a subject of his degree course;

Provided further that exemption from the condition of additional examination in such subjects may be conceded to a graduate who holds the status of a

professor or lecturer in a college affiliated to the University of New Zealand, or who has for not less than three consecutive years held the position of principal of a secondary school in the Dominion:

(ii.) In the case of a candidate who has obtained or is entitled to obtain a Class C certificate,—

(a.) If he passes the examination for a Bachelor's degree in the University of New Zealand; or

(b.) If he passes such further examination as will enable him to fulfil the following conditions—namely, that with both examinations (the Class C examination and the further examination) taken together, he—

(1.) Shall have satisfied the requirements in not less than six of the subjects of Part III (optional subjects) of the examination for Class C, of which one shall be either Pure Mathematics or one of the languages Latin, Greek, French, German; provided that a candidate in whose case courses of work have been recognized for a certificate of Class C in accordance with clause 15 of these regulations may be deemed to have satisfied the requirements in such of the subjects of Part III of the examination for Class C as the Inspector-General of Schools may determine; and

(2.) Shall have gained certificates of proficiency in not less than three of the subjects prescribed for the Bachelor of Arts or Bachelor of Science degree (Pure Mathematics and Applied Mathematics being for this purpose reckoned separately), or in lieu thereof shall have satisfied the pass requirements of such degree subjects of the University, being not not less than three, as shall in the opinion of the Inspector-General of Schools be deemed a fair equivalent therefor.

9. The holder of a Class C certificate who at any time, with a view to the ultimate promotion to Class B, produces evidence of having satisfied the University requirements in any of the degree subjects accepted under the foregoing clause shall, on making due application to the Inspector-General of Schools, be entitled to have a record of his success endorsed upon his certificate.

10. The examination requirements for Class A shall be the same as for Class B, with the addition of such success at an honours examination of the University of New Zealand as is required for first-class or second-class honours, but with no limit as to the time of passing such honours examination, and without the obligation of having first to obtain the diploma for a degree.

OTHER QUALIFICATIONS OF CANDIDATES.

11. Before a certificate can be issued to a candidate he must produce evidence—

- (a.) That he has attained the age of twenty-one years;
- (b.) That he is of good moral character;
- (c.) That he is of sound health and good constitution, and that he is free from all such physical defects as are incompatible with efficiency in teaching.

The evidence of age submitted shall, if possible, be a Registrar's certificate of birth. In the case of a candidate by whom a Registrar's certificate of birth is not procurable, it shall be for the Minister of Education to decide what other documentary evidence of age and identity may be accepted instead of such certificate.

As evidence of good character, testimonials of recent date must be presented from not less than two persons of approved standing and repute.

In proof of health and freedom from physical defects under this clause, no medical certificate shall be regarded as sufficient unless it is on the form provided for the purpose and is signed by the medical officer appointed thereto by the Minister.

For the purpose of the issue of a teacher's certificate or of a license to teach, a candidate shall be regarded as having attained the age of twenty-one years on the first day of the month nearest to his twenty-first birthday.

EQUIVALENT STATUS.

12. A certificate shall not be granted except after examination held in accordance with these regulations, or after proof of the passing of an equivalent examination held by some sufficient public authority; provided that a partially equivalent examination may be recognized *pro tanto*, and supplemented by such further examination as may be deemed necessary by the Inspector-General of Schools, who shall be the judge of the value to be assigned to examinations proposed for acceptance as equivalent or partially equivalent.

13. Anything in the preceding clause notwithstanding, a teacher holding a teacher's certificate issued by a recognized public authority outside the Dominion may, subject to the provisions of clause 11, be granted an equivalent status, if the Inspector-General of Schools is satisfied of the sufficiency of the qualification. In any such case, until the evidence submitted is confirmed, on reference to the public authority concerned, a classification so granted shall be deemed to be provisional only, and may at any time be revoked.

14. For a certificate granted under either of the two last preceding clauses, on the ground of having passed an examination of equivalent value, or of holding an equivalent certificate elsewhere obtained, a fee of one pound sterling is payable in the manner notified in clause 18 hereof for the payment of examination entrance fees.

TRAINING COLLEGE CERTIFICATE.

15. Nothing in these regulations shall be taken to forbid the issue of a teacher's certificate at the close of an approved course in a training college to a duly qualified person who, being regularly admitted as a student of Division A or of Division B in accordance with the regulations relating to training colleges for the time being in force, has satisfied all the requirements of the course of training prescribed, and has served as a teacher for the necessary period as required for classification under clauses 5 and 6 hereof.

On the issue of any such certificate a fee of one pound shall be payable in the manner prescribed in clause 18 hereof.

DATE OF EXAMINATION.

16. An examination for the two Classes D and C shall be held every year in the month of January, beginning not earlier than the fifth day of the month, and ending, if possible, not later than the eighteenth day of the month.

EXAMINATION CENTRES.

17. The examination shall be held at the chief town of each education district, and at such other places in the Dominion as the Inspector-General shall from year to year recognize as suitable and desirable as centres of examination.

Any place at which there are ten or more candidates to be examined may be made an examination centre, and a place where there are fewer than ten candidates may be made a centre, if the candidates by additional payments make up the total payments to a sum of ten pounds: Provided that no place shall be recognized as a centre unless it is found that thoroughly satisfactory arrangements can be made thereat for the conduct of the examination.

NOTICE OF CANDIDATURE: ENTRANCE FEE AND LATE FEE.

18. Every candidate must give notice of his wish to be examined, the notice being given on a form of application provided for that purpose, and procurable at the office of any Education Board. The notice must be sent so as to reach the office of the Education Department, Wellington, not later than the fifteenth day of October next before the examination, and must be accompanied by a receipt for the payment of the amount of the entrance fee as hereinafter prescribed to the Public Account of some branch of the Bank of New Zealand. (See clauses 33, 48.)

19. Candidates shall, at the time of making application to be examined, say at which centre they wish to present themselves. They may afterwards, up to the thirty-first day of October, elect to be examined at some other centre upon payment of an additional fee of ten shillings.

20. Notwithstanding anything contained in clause 18 hereof, a candidate's notice and application to be examined may be received between the fifteenth and the thirty-first day of October, if it is

accompanied by a bank receipt for a late fee of one pound sterling in addition to the entrance fee.

NOTIFICATION OF RESULTS, AND SPECIAL MENTION.

21. Notification of the successes of candidates at any certificate examination shall, as soon as possible after the close of the examination, be given by publication in the *New Zealand Gazette*. In addition to such general notification, information will be given to each candidate individually of his success or failure in the several subjects. With the report of every examination lists will be published containing the names of candidates who pass in any subject with sufficient distinction to warrant special mention.

EXAMINATION FOR CLASS D.

22. The examination for Class D shall be in the subjects of the following schedule :—

Group I (*Compulsory*).

- (1.) Reading and Elocution.
- (2.) English Language and Composition.
- (3.) Elementary Mathematics I—Arithmetic.
- (4.) Elementary Mathematics II (*compulsory for men only*)
—Algebra and Geometry.

Group II (*Compulsory*).

- (5.) Geography. (300 marks.)
- (6.) History and Civics. (200 marks.)
- (7.) Drawing I—Free Drawing with Pencil or Brush. (100 marks.)
- (8.) Drawing II—Drawing with Instruments. (100 marks.)
- (9.) Writing. (100 marks.)

Group III (*Compulsory*).

- (10.) Methods of Teaching. (300 marks.)
- (11.) Elementary Hygiene. (200 marks.)
- (12.) Vocal Music. (200 marks.)
- (13.) Drawing III—Blackboard Drawing. (100 marks.)
- (14.) Needlework (*compulsory for women only*). (200 marks.)

Group IV (*Optional Subjects*).

Division I—

- (15.) Elementary Experimental Physics.
- (16.) Elementary Botany, or (17) Elementary Zoology.
- (18.) Elementary Practical Agriculture.
- (19.) Elementary Dairy Science.
- (20.) Elementary Home Science, or (21) Elementary Chemistry.

Division II—

- (22.) Latin.
- (23.) Greek.
- (24.) French.
- (25.) German.
- (26.) Italian.
- (27.) Spanish.
- (28.) Maori.

Division III—

- (29.) Book-keeping and Commercial Correspondence.
- (30.) Elementary Handwork I—Modelling in Plasticine or Clay, Paper-work, and Brick-laying.
- (31.) Elementary Handwork II—Cardboard-work.
- (32.) Woodwork.
- (33.) Ironwork.
- (34.) Military Drill.

(NOTE.—“Elementary Mathematics II—Algebra and Geometry,” as defined under “Group I, Compulsory Subjects,” may be taken by women as an optional subject in lieu of one of those included in Divisions II and III of Group IV.)

23. To pass the examination for Class D candidates will be required—

- (a.) To show a good standard of attainment in each of the subjects Reading, English, and Elementary Mathematics of Group I;

- (b.) To obtain a satisfactory aggregate of marks in each of the Groups II and III; and
- (c.) To satisfy the pass requirements in not less than two subjects selected from Group IV, of which at least one subject shall be taken from the first division of the group (Group IV, Division I):

Provided that no candidate shall be permitted to obtain credit for any of the compulsory groups whose marks in any subject of the group fall below 35 per cent. of the maximum marks allotted to that subject.

24. Candidates for Class D may take the examination as an undivided whole, or they may elect to take it in two sections, of which the subjects of Group I and two other groups of subjects shall form the First Section, and the Second Section shall include the remaining subjects. Candidates complying with the requirements of the First Section will be given credit for the section, and will be at liberty thereafter to complete the examination by passing in the Second Section.

Partial success towards the completion of the First Section may also be recorded in favour of a candidate—

If, failing to pass in the section, he passes in two of the compulsory groups of subjects; or

If he passes in one of the compulsory groups and so nearly fulfils the requirements of the two other groups required to form the First Section as to leave altogether a deficiency in one or two subjects only in question.

In any such case the candidate will be permitted to complete the First Section at the next ensuing examination by passing further in the group of subjects constituting the deficiency. If he does not then complete the First Section he must take in any subsequent examination all the subjects still required to complete the Class D examination.

25. Where partial success has been recorded towards the First Section the candidate may elect either to complete the section at the next ensuing examination, or he may then enter for the Second Section, which shall in such circumstances include any group or subjects of the First Section in which he has not already passed. No candidate can be permitted to enter for the Second Section until he has obtained a complete or partial pass in the First Section.

26. A candidate will be regarded as having obtained a "partial pass" for Class D if he passes in the First Section.

27. No further partial success towards the requirements of a section or of the examination as a whole can be recognized for record; provided that if on being examined for the Second Section, or as a candidate in the undivided schedule of subjects, a candidate is shown to be deficient by one subject only, he may be permitted to complete the examination by taking any such subject at a subsequent examination, and showing satisfactory attainments therein. Except as thus or otherwise specially provided, the group is to be regarded as the unit of examination, and not the individual subjects of any group.

28. In the examination for subjects of the optional group no candidate shall be permitted to take more than three subjects at any one examination, or more than four subjects if one is an additional subject required to be taken by a candidate to whom permission has been given to omit vocal music in terms of clause 32 hereof.

29. Any candidate that passes the Matriculation Examination of the University of New Zealand shall be entitled to exemption from further examination for Class D in the subjects of corresponding character in which he has passed, provided that, where in the Class D examination a certificate of practical work or a practical test is prescribed, the candidate may be required further to satisfy the necessary condition.

Candidates who desire to obtain exemptions under this clause are required to make application to the Education Department on a form specially provided for the purpose.

30. A candidate who has obtained a partial pass for Class D under earlier regulations may complete the examination by passing under the present regulations in the subjects corresponding in character to those in which he previously failed to pass.

31. Candidates who hold certificates of Class E may be granted exemption for Class D in subjects in which the examination already passed can be accepted as of an equivalent standard.

32. To satisfy the requirements in Vocal Music for Class D candidates will be required to attain a minimum standard in both paper-work and practical tests, but if a candidate from natural defects is not prepared to fulfil this condition he may obtain from the Inspector-General of Schools permission to omit the subject. In any such case the candidate will, however, still be required to obtain on the remaining subjects of the group an undiminished aggregate of marks to satisfy the pass conditions of the group, and must pass in addition in some optional subject not otherwise chosen as for Class D or for Class C. Any such additional subject so selected the candidate will not be allowed to reckon either at the same time or afterwards as an ordinary subject for Class D or any higher class.

EXAMINATION FEES FOR CLASS D.

33. With every application to be examined for Class D as a whole, or to be examined for the First Section of Class D, an entrance fee of one pound is payable by the candidate in the manner specified in clause 18 of these regulations. For examination in the Second Section or for completion of the First Section the entrance fee is ten shillings, unless a single subject only is required, in which case, and for any subsequent entry permitted by the regulations in a single subject, a fee of five shillings is payable.

EXAMINATION FOR CLASS C.

34. To qualify for a certificate of Class C candidates are required to pass—

- (i.) In the Class D compulsory groups of subjects (Groups I, II, and III of the Class D schedule—clause 22) as for the First Section of Class D, and under the same conditions;
- (ii.) In the two special compulsory subjects of the Class C schedule forming Part II of the Class C examination; and
- (iii.) In a sufficient number of optional subjects (Part III) as prescribed in clause 36 hereof.

35. The following is the schedule of examination for Class C:—

Part I (Compulsory).

Groups I, II, and III of the Class D schedule, as prescribed in clause 22 hereof, for the First Section of the Class D examination.

Group I.

- (1.) Reading and Elocution.
- (2.) English Language and Composition.
- (3.) Elementary Mathematics I—Arithmetic.
- (4.) Elementary Mathematics II (*compulsory for men only*)
—Algebra and Geometry.

Group II.

- (5.) Geography. (300 marks.)
- (6.) History and Civics. (200 marks.)
- (7.) Drawing I—Free Drawing with Pencil or Brush. (100 marks.)
- (8.) Drawing II—Drawing with Instruments. (100 marks.)
- (9.) Writing. (100 marks.)

Group III.

- (10.) Methods of Teaching. (300 marks.)
- (11.) Elementary Hygiene. (200 marks.)
- (12.) Vocal Music. (200 marks.)
- (13.) Drawing III—Blackboard Drawing. (100 marks.)
- (14.) Needlework (*compulsory for women only*). (200 marks.)

Part II (Compulsory).

- (15.) Principles and History of Education.
- (16.) English Language and Literature.

Part III (Optional Subjects).

Division I—

- (17.) Mechanics and Hydrostatics.
- (18.) Heat and Light.

- (19.) Magnetism and Electricity.
- (20.) Chemistry.
- (21.) Physiography.
- (22.) Geology.
- (23.) Botany.
- (24.) Zoology.
- (25.) Physiology and the Structure of the Body.
- (26.) Domestic Science I.
- (27.) Domestic Science II.
- (28.) Domestic Science III.
- (29.) General Agriculture.
- (30.) Dairy Science (including the Economics of Dairying).
- (31.) Agricultural Chemistry.*
- (32.) Agricultural Botany and Zoology.*
- (33.) General Hygiene.*

[*A candidate cannot receive credit for Chemistry (20) together with Agricultural Chemistry (31), nor for Botany (23) or Zoology (24) together with Agricultural Botany and Zoology (32), nor can General Hygiene (33) be reckoned as a separate subject in addition to Domestic Science III (28).]

Division II—

- (34.) Latin.
- (35.) Greek.
- (36.) French.
- (37.) German.
- (38.) Italian.
- (39.) Spanish.
- (40.) Maori.
- (41.) Pure Mathematics.
- (42.) Economics.

Division III—

- (43.) General History.
- (44.) English Constitutional History.
- (45.) Economic History.
- (46.) Logic.
- (47.) Psychology.
- (48.) Economic Geography.
- (49.) Accounting.
- (50.) Woodwork.
- (51.) Ironwork.
- (52.) Military Science.
- (53.) One or more subjects each consisting of any two of the following :—
 - (a.) Dressmaking.
 - (b.) Elementary Handwork I—Modelling in Plasticine or Clay, Paper-work, and Brick-laying.
 - (c.) Elementary Handwork II—Card-board-work.
 - (d.) Woodwork.*
 - (e.) Ironwork.*
 - (f.) Military Drill.*

As for Class D.

[*Not to be reckoned if (50) Woodwork, (51) Ironwork, or (52) Military Science, respectively, is taken.]

36. Of the optional subjects included in Part III of the Class C schedule, candidates must satisfy the pass requirements—

- (a.) In four subjects, of which one must be taken from Division I; or
- (b.) In three subjects, if one is taken from Division I and another from either Division I or Division II.

37. No record of success towards Class C can be made that does not include two of the subjects comprised in Parts II and III; otherwise no restriction is placed on the order in which Parts I, II, and III may be taken by a candidate, or on the order and grouping of the subjects of Parts II and III, or on the time of completion of Part I, provided that of the subjects of Part III (optional) no candidate shall be allowed to take more than five at any one examination.

38. A candidate entering for Class C and either wholly or partially successful in Part I of the examination only may be credited with the First Section of Class D or with partial success towards the First Section of Class D, as the case may be. In the latter case, if he does not complete the section at the next ensuing examination,

he can be permitted to do so later only as part of the Second Section of Class D, or in association with two Class C subjects from Part II or Part III as required in the preceding clause for Class C candidates.

39. Candidates who have qualified for Class D, or who have obtained the First Section of Class D in the groups prescribed for Part I of the Class C examination, are exempt from further examination in the subjects comprised in Part I.

40. A candidate for Class C who is credited with the subject of English Language and Literature of Part II of the schedule, or with the subject of Pure Mathematics of Part III, shall be deemed to be exempt from examination in the corresponding subject of Part I, Group I.

41. Candidates may receive exemption from examination in any subject of Division I or Division III of Part III by producing the certificate of the Board of Education, London, of the Second or any higher stage, or the certificate of the City and Guilds of London Institute, for that subject or for a subject of cognate character that in the judgment of the Inspector-General of Schools is a fair equivalent; provided that for a Second Stage subject of the Board of Education a certificate of the first class in the stage may be required; provided further that in cases where in the corresponding subject a certificate of practical work is prescribed by the regulations the candidate may be required in addition to furnish similar evidence.

42. Exemption from examination in any subject for Class C may be obtained by passing in that subject at a degree examination of the University of New Zealand.

43. Candidates that at the Junior Scholarship Examination of the University of New Zealand have obtained "credit" shall not be required to take at the examination for Class C the subjects in which they may be shown to have gained not less than 45 per cent. of the possible marks at the Scholarship Examination, subject to the production of a certificate of practical work as prescribed by clause 41 hereof.

44. Subject to a similar proviso, candidates that have passed the Civil Service Senior Examination shall not be required to pass again for Class C in the subjects in which they have already passed at the Senior Examination.

45. Teachers that already hold certificates of a lower grade shall, upon passing any part of the further examination required for Class C, be entitled, on making due application to the Inspector-General of Schools, to have a record of their success endorsed upon their certificates.

46. Any exemptions from examination granted to candidates in respect of subjects for the Class D examination shall apply equally to the corresponding subjects of Part I in the examination for Class C.

47. A candidate who has been granted a partial pass for Class C under earlier regulations on a similar principle to that governing a partial pass for Class D shall be at liberty to complete the examination by passing in the subjects corresponding in character to those previously required for completion.

EXAMINATION FEES FOR CLASS C.

48. The entrance fees payable by candidates for Class C in respect of Part I of the examination are the same as those payable under clause 33 hereof on entry for the First Section of Class D or for the completion thereof. For subjects of Parts II and III an entrance fee of one pound is payable for two or more subjects taken at the same examination, or of ten shillings for entry in a single subject. For the whole examination for Class C taken at any one time, or for any continuation in the same examination of Part I with Parts II and III, or with either of these parts, the entrance fee payable is thirty shillings, unless for the same subjects or parts taken separately a less sum would be payable.

EXAMINATION IN ELEMENTARY HANDWORK: SPECIAL CERTIFICATES.

49. The examination in subjects of Elementary Handwork: namely—

- (I.) Modelling in Plasticine or Clay, Paper-work, and Brick-laying
- (II.) Cardboard-work.

will be conducted at such times and places as may from time to time be arranged with the Education Board of the district, and

those who desire to be examined in either branch must be prepared on receiving due notice to present themselves accordingly.

50. Candidates who take Elementary Handwork as part of the ordinary certificate examination are required to include the subject or subjects selected in the application to be examined for which provision is made in clause 18 of the regulations, but the examination may also be taken independently either by candidates for teachers' certificates or by others. In the latter case applications, accompanied by the amount of the entrance fee, should be lodged in good time with the Secretary of the Education Board. For the examination so taken an entrance fee of five shillings for each subject or subject-group is payable by the candidate, except in the case of pupil-teachers or probationers at the time of examination in actual employment by an Education Board, for whom no entrance fee for a subject of Elementary Handwork is required.

51. Candidates who satisfy the requirements in both branches of Elementary Handwork as defined in clause 59, paragraphs (30) and (31) for the Class D (or Class C) examination shall be entitled to receive a special certificate therein, whether their attainments in the subjects included be reckoned among the grounds on which a teacher's certificate is issued to them or not. In lieu of such special certificate candidates may, however, if they so desire, have their success in Elementary Handwork specially endorsed on the teacher's certificate already held by them.

SPECIAL CERTIFICATES FOR TEACHERS OF DEAF-MUTE, BLIND, OR MENTALLY DEFECTIVE CHILDREN.

52. On such terms as the Minister of Education may from time to time determine, special certificates of competency in the method and practice of teaching deaf-mute, blind, or mentally defective children may also be granted to properly trained persons in the service of the Dominion whether a general teacher's certificate is held by them or not, or in lieu thereof an endorsement of the special training received may be made on a teacher's certificate already held.

LICENSE TO TEACH.

53. A candidate that falls not far short of the examination requirements for a teacher's certificate may, on the recommendation of an Inspector of Schools, and subject to the conditions of clause 11 hereof as to evidence of character and health, receive a license to teach, provided that he has attained the age of twenty-one years, and has had not less than two years' experience in teaching as defined in clauses 5 and 6 hereof. Such license shall be in force for a period of two years, to be regarded as expiring on the last day of June or the last day of December, as the case may be, next following the date on which the two years are completed, and shall during its currency have the force of a temporary certificate.

54. A candidate for a teacher's certificate who has not yet attained the age of twenty-one years, but who satisfies in all other respects the requirements for a certificate under these regulations, may, if he has already attained the age of eighteen years, receive a license to teach, which license shall be renewable until he has attained the age of twenty-one years, and shall then, upon the production of such further evidence of continued good character as may be required, be convertible into a full certificate.

55. In the discretion of the Minister of Education, licenses to teach may, on further consideration of the circumstances in each case, be renewed at the close of the period for which they were originally granted; but a renewal will not, as a rule, be conceded unless a recommendation for a renewal has been made by an Inspector of Schools who has good means of forming an opinion of the holder's services as a teacher. Candidates for the renewal of licenses to teach may be required to show that material progress has, since the issue of the license, been made by the holder towards the acquirement of a full certificate qualification. Any renewal of a license may be for the full term of two years or for any shorter term.

56. Upon the issue of a license to teach, and upon every renewal of a license, excepting such issue or renewal as may be made in accordance with the provisions of clause 54 hereof, a fee of ten shillings is payable to the Public Account in the manner specified in clause 18 of these regulations for the payment of examination entrance fees.

LIST OF CERTIFICATED TEACHERS.

57. In the month of June in each year a list of teachers holding certificates and licenses shall be issued by the Minister of Education, and such list shall set forth in every case of promotion to a higher class or division the reason of such promotion; and after the publication of such list every teacher that has been so promoted shall be entitled, upon making due application to the Inspector-General of Schools, to have a record of his promotion endorsed upon his certificate. The name of any teacher that is not known to have been actively engaged in the work of education at any time during the previous five years shall be omitted from the list, unless he shall have made application since the publication of the previous list to have his name retained on the list or restored to it.

CANCELLATION OR SUSPENSION OF CERTIFICATES.

58. The Minister of Education shall have power to cancel any certificate or license to teach if the holder of the certificate or license shall at any time be proved guilty of immoral conduct or gross misbehaviour within the meaning of the Education Act, 1908. He shall also have power for sufficient cause shown to suspend any certificate or license to teach for such period as he thinks fit.

PROGRAMME OF SUBJECTS—CLASS D.

59. The scope of the examination in the several subjects of Class D is here set forth.

N.B.—In any subject presented for a teacher's certificate questions may be set in examination bearing upon the method of teaching the subject.

Group I.

- (1.) *Reading and Elocution.*—The candidate may be required to read, without time for preparation, a passage from some well-known prose work, or from the leading article of a newspaper, and also a passage of verse. He will also be required to present for a test in recitation not less than two hundred lines of poetry and one hundred lines of prose selected by him from standard English authors. The prose selected for recitation should be taken in general from the works of some noted historian or essayist, or from the speeches of a celebrated orator, and should not be in the form of dialogue. Special note will be taken of enunciation and articulation, correct pronunciation, fluency, phrasing, inflection, tone, expression, and intelligence. The character of the selections made by the candidate for recitation in poetry and prose will also be taken into account.
- (2.) *English Language and Composition.*—The principles and practice of composition, including exercises in such divisions of composition as the explanation or reproduction in précis or outline of prose or verse passages from the best-known plays of Shakespere, and from modern standard authors; conversion of direct into reported speech and *vice versa*; punctuation, sentence-structure; arrangement of the paragraph; uses and misuses of words, and the detection and correction of errors and ambiguities of expression; essays on topics of common interest.

Grammar (not including historical grammar) so far as it may be taken as bearing directly on or as subsidiary to the teaching of composition in public elementary schools; the nature and classification of modern English sounds in relation to their bearing on the spoken language and on orthography.

- (3.) *Elementary Mathematics I.*—Arithmetic: Fundamental rules, vulgar and decimal fractions, approximations, proportion, percentages (including interest, profit, and loss), stocks, square root, cube root of numbers reducible to prime factors not greater than eleven, metric system, areas of plane rectilinear figures and of circles, mensuration of the prism, pyramid, sphere, circular cylinder, and circular cone.

The use of algebraical symbols and processes and of graphical methods will be permitted.

(4.) *Elementary Mathematics II.*—(a.) Algebra: Fundamental operations, factors, fractions, simple equations involving one or two unknown quantities, and easy quadratic equations involving one unknown quantity; easy problems; graphs of simple rational integral algebraic functions; and graphical methods of solving equations.

(b.) Geometry: The paper 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 centimeters and millimeters, set-squares, a protractor, compasses, and a fine pencil. All figures should be drawn accurately. Questions may be set in which the use of the set-square or of the protractor is forbidden.

The questions in 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 the sequence of their treatment.

In the proof of theorems and deductions from them, the use of hypothetical constructions will be permitted. Proofs which are applicable only to commensurable magnitudes will be accepted.

SCHEDULE A (PRACTICAL).

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.

Divisions of straight lines into a given number of equal parts or into parts in any given proportions.

Construction of a triangle equal in area to a given polygon.

Construction of tangents to a circle and of common tangents to two circles.

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 three, four, six, or eight sides in or about a given circle.

Construction of a square equal in area to a given polygon.

Determination by measurement of the ratio of the circumference of a circle to its diameter.

Approximate determination of the area of a circle.

SCHEDULE B (THEORETICAL).

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.

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.

Triangles and other 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 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.

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.

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

$$\begin{aligned}
 k(a + b + c + \dots) &= ka + kb + kc + \dots \\
 (a + b)^2 &= a^2 + 2ab + b^2 \\
 (a - b)^2 &= a^2 - 2ab + b^2 \\
 a^2 - b^2 &= (a + b)(a - b).
 \end{aligned}$$

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

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.

The Circle.

A straight line, drawn from the centre of the 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.

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.

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.

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.

Group II.

- (5.) *Geography.*—The requirements will be based on the programme of work prescribed for geography in the regulations governing the course of instruction in public elementary schools, but will be more advanced in character. Special stress will be laid on physical geography. Special attention should also be given to the geography of New Zealand and of the British Empire generally with reference to salient facts of their physical and social geography, or in illustration of geographical principles.
- (6.) *History and Civics.*—The requirements will be based on the work prescribed for history and civic instruction in the regulations governing the courses of instruction in public elementary schools, but will have special reference to the history of British Empire extension, the rights and duties of the citizen, the principal facts of local and general government in New Zealand, and the principal social and industrial improvements made since the accession of Queen Victoria.
- (7.) *Drawing I.*—Free drawing with pencil or brush: The candidate shall be required to draw on a half imperial sheet of paper (i) a natural object, or (ii) a fashioned or artificial object or a group of such objects placed before him either above or below the line of sight. In the case of (i) the candidate may also be required to show that he is able to adapt the form of the object placed before him to decorative purposes. The object or objects are to be represented as seen from the point of view at which the candidate may be seated. The candidate may use the pencil or brush to estimate the apparent relative sizes of the objects or parts of the objects to be drawn, but only by holding it between the eye and the objects. No other form of measuring and no ruling or other mechanical means of execution are allowed. The drawing, which should be as complete as possible, may be

made in outline or in light and shade, and must fairly fill the sheet of drawing-paper.

- (8.) *Drawing II.*—Drawing with instruments: The candidate will be expected to be familiar with the geometrical operations and constructions set out in Schedule A of the subject Elementary Mathematics II (Group I (4)). The measurement of straight lines and of angles. The construction of plain scales. Drawing to scale from dimensioned sketches. The method of enlarging and of reducing a given diagram. Plans and elevations of straight lines and of plane figures lying in, standing vertically on, or inclined to the horizontal plane (but not in the latter case inclined also to the vertical plane). Plans and elevations and conventional isometric views of the following solids and of simple objects based thereon: the cube, the rectangular block, the triangular and the square prism, and the triangular, the square, and the hexagonal pyramid, the solid or object as the case may be having its base in the horizontal plane, and one edge of the base parallel to the vertical plane.

Candidates may obtain exemption from examination in Drawing I or Drawing II by producing a second-class certificate of the Board of Education, London, in a subject of corresponding character.

- (9.) *Writing.*—Exercises in text hand, half-text, and small hand, or of varied form, in such style as the candidate would adopt in setting copies for children. In the text-hand exercise the height of the smaller letters is to be the same as the space between two lines on an ordinary sheet of ruled foolscap, say, one-third of an inch. The tests given may also include an exercise in current hand of an informal character.

Group III.

- (10.) *Methods of Teaching.*—The methods of teaching the subjects taught in public schools, including the methods of physical education; the methods and principles of infant-teaching; class-management; brief notes of lessons; registers and returns. Candidates will also be required to possess a knowledge of the courses of instruction prescribed by regulation for public schools, and should be prepared to outline therefrom a scheme of instruction suitable for a specified class or class-group in any subject.

- (11.) *Elementary Hygiene.*—Elementary hygiene, physiology, and "first aid" as follows: General idea of the cell as a unit of tissues and organs of the body; division of labour.

The general form and external characters of the body; the form and relative position of the parts of the skeleton and of the chief muscles, organs, great blood-vessels, and nerve-trunks, with special reference to those parts which can be recognized externally.

The mode of attachment and action of muscles. The structure and mechanics of the principal joints. The structure, as revealed by a hand magnifier, of cartilage, bone, tendon, ligament, and muscle, and of the walls or substance, as the case may be, of the chief organs of the body.

Importance of attitudes and postures; spinal curvature; signs of fracture, and first aid to be rendered in such accidents; treatment of bruises and sprains; bandaging.

The arrangement of the alimentary canal. The chief foodstuffs and the chemical elements they contain. Examples of the occurrence of proteids, gelatin, starch, sugar, and fat in articles of food. The form in which nitrogen, hydrogen, and carbon enter and leave the body. Changes produced in foods during their passage through the alimentary canal; the scene of and the agents causing these changes. How and where the products of digestion are absorbed, and how they are distributed through the body; waste products; excretion.

Care of the mouth and teeth. General composition, relative value and digestibility of the more important

food substances and beverages; standard diets; daily and balanced rations; importance of good habits of eating and drinking; effects of exercise on digestion. The effect of stimulants; harmful effects of alcohol; putrefactive changes in food and the signs of such changes; food-poisoning. The mechanics of respiration and circulation; differences between inspired and expired air, between venous and arterial blood, and between blood and lymph.

The physical composition and functions of blood. The general differences between arteries, capillaries, and veins, and in the flow of blood therein.

The factors influencing the amount of the expiratory output of carbonic acid. The chief sources of heat-production in the body; the mean temperature of the body in man, and the chief agents keeping it uniform. The general structure and functions of the skin. The importance of cleanliness and of sanitary habits; washing and bathing; materials of clothing; body and bed clothing. The general structure and action of the vocal organs. Composition and impurities of air; breathing-exercises; artificial respiration and its application in cases of drowning or suffocation. Treatment of cuts and wounds; points where the main blood-vessels may be compressed. Treatment of faints, burns, scalds, bites, stings, and poisoning. Prevention of epidemic and endemic diseases. Antiseptics and disinfectants, their selection and application. First aid in cases of insensibility, sudden illness, or collapse; methods of lifting and the conveyance of the sick or injured. A general knowledge of the nervous system as a whole; an elementary knowledge of the general structure and functions of the brain and spinal cord; brain centres; co-ordination and association; the distinction between motor and sensory nerves as regards the parts to which they go and the results produced by nervous impulses through them; the structures concerned in reflex action.

Requirements of a healthy nervous system (nourishment, regular habits, exercise, manual and intellectual work, periods of rest and change of occupation). Evil effects of malnutrition, overstrain, impure air, bad habits. Physical and mental fatigue; sleep. The different kinds of sensations; the megascopic structure of the eye-ball so far as can be observed by ordinary dissection; the parts of the eye traversed by rays of light and the alteration thus produced in the direction of the rays; the blind spot; accommodation. Eye-strain and its common causes; long and short sight; removal of foreign bodies from the eye.

A knowledge of the megascopic structure of the ear so far as is necessary to explain how sound-waves are conveyed to the nerves of hearing.

Elementary principles of school hygiene. Measurement of height, weight, and chest of school-children. Detection of early signs and symptoms of common infectious diseases, and of physical and mental defects.

Candidates will be expected to be familiar with the more important steps to be taken in dissecting, say, a rabbit, and they may be required to recognize and describe parts of the animal body from specimens or photographs.

Candidates will be required to produce evidence of having satisfactorily attended an approved course in First Aid and Ambulance.

- (12.) *Vocal Music*.—(a.) Paper-work: The notation of time, tune, &c. Candidates will be expected to show an acquaintance with both the tonic sol-fa and the staff notations. The order and manner of teaching, to include the subjects of breathing, voice-training (with suitable exercises for class use), time, tune, ear-training, &c. The diatonic (major and minor) and chromatic scales. The common terms and signs used in music. The writing of one or more simple tunes from memory, also of suitable blackboard exercises for specific objects.

(b.) Practical tests: A simple ear-test, to consist of phrases to be imitated by the candidate from the examiner's pattern, or of short passages to be written down from dictation. A time-test, consisting of a few measures to be sung on one note to the examiner's counting. A tune-test, consisting of a short melody in a major or minor key, and introducing the common accidentals of the sharpened fourth or flattened seventh (fe and ta), or modulation (transition) to the next sharp or flat key; the melody to be sung to the sol-fa syllabus or to "lah," the examiner giving the keynote. A simple standard song selected by the candidate to be sung in the presence of the examiner.

Viva voce questions on the notation, &c., of the above tests may be asked at the discretion of the examiner.

[For conditions of exemption, where necessary, in *Vocal Music*, see clause 32.]

- (13.) *Drawing III.*—Drawing on the blackboard: The examination in this branch of drawing is intended to test the capacity of candidates to execute rapid and direct drawings in chalk (white or coloured) on the blackboard. Highly finished drawings are not required, but the sketches should express the ideas they are intended to convey simply and clearly. Candidates will be required to make, with or without instruments, drawings in outline or in mass, as may be most suitable, from memory, knowledge, and imagination, as illustrations of lessons in various subjects of the public-school syllabus—*e.g.*, English, History, Geography, Science, Nature-study, Drawing, and other branches of handwork—all of which afford ample and suitable material for practice.

Candidates will do well to remember, on the one hand, that speed in execution is of no utility unless combined with truth and accuracy, as a drawing which gives an erroneous impression of an object is worse than useless; and, on the other hand, that slowness in delineating an object tends to make drawing a hindrance instead of an aid to a lesson; and, more than all, that speed with accuracy and truth of expression can only be acquired by steady and adequate practice and by attentive observation.

- (14.) *Needlework.*—The repairing of any plain article of under-clothing; the drawing of diagrams of such a plain article, and the cutting-out and making of it. The answering of questions on needlework as required in the public-school syllabus.

Candidates holding certificates in Plain Needlework or in Dressmaking granted by the City and Guilds of London Institute are entitled to exemption from further examination in this subject for the Class D and Class C certificates.

Group IV.

DIVISION I.

- (15.) *Elementary Experimental Physics.*—The candidate will be expected to show that he has acquired his knowledge of the matters set forth in the subjoined syllabus by actual experiment, observation, and measurement; but he will not be expected to show that he is familiar with other than the simple apparatus and appliances commonly used in connection with elementary instruction in practical physics in primary or secondary schools.

British and metric systems of measurement. Plotting curves. Measurement of lines and of areas of simple plane and curved surfaces; measurement of the volume of regular and irregular solids; indirect measurements (*e.g.*, thickness of thin, uniform plates, wires, &c.). The vernier, slide callipers, and micrometer. The balance; tests of accuracy; methods of weighing; rules to be observed in weighing.

Density of solids and liquids; principle of Archimedes; specific gravity; flotation; the hydrometer and lactometer; the U tube. Transmission of fluid pressure; water-level; artesian wells. The barometer; verification of Boyle's law. Centre of gravity; methods of finding

its position in simple cases; stable, unstable, and neutral equilibrium.

The representation of force; the spring balance; composition and resolution of concurrent forces; determination of the resultant of parallel forces; moments of force. Simple machines. Simple measurement of frictional forces. Simple experiments illustrating elasticity; comparison of the flexure produced by a given weight in rods of different size and material. The simple pendulum.

Measurement of expansion by heat of solids, liquids, and gases; transference of heat; application to hot-water circulation systems and ventilation. Thermometers; experiments on melting and solidifying points, on boiling-points, and on evaporation and condensation with the following substances—paraffin-wax, butter, water, salt-solution, methylated spirits. Measurement of heat; specific and latent heats treated very simply. Dew-point.

Propagation of light; pin-hole images; shadows; photometry. Laws of reflection and refraction of light with reference to plane surfaces; transmission of light through a plate, a prism, and a lens; formation of images by single convex lenses; the simple magnifying-glass; the spectrum.

Properties of magnets; methods of making magnets. Induction. Elementary notions of the magnetic field and lines of force. The earth as a magnet; dip; declination.

Electrification by friction and by induction. Conductors and non-conductors; the gold-leaf electroscope and its use; distribution of electrification on conductors; hollow conductors; the electrophorus.

Elementary notions of the electric current, of the means of procuring it, of its magnetic, heating, and chemical effects, of electromotive force and resistance. Ohm's law. The galvanoscope, its use in detecting changes in the strength of a current and in comparing (roughly) the strengths of different currents and the resistances of different conductors. The voltameter. The glow lamp.

The candidate will be required to forward, before the date of examination, a certificate in the prescribed form that he has carried out satisfactorily a course of practical work based on the above syllabus.

(16.) *Elementary Botany* (alternative with *Elementary Zoology*).

—The candidate will be required to show that he has acquired his knowledge of the following topics by observation, investigation, and experiment:—

The organs of flowering-plants, their arrangement and principal modifications; their functions, so far as can be ascertained by observation and simple experiments.

The general arrangement, distribution, and structure of plant-tissues, so far as they can be studied with the aid of a good hand lens. The structure of fruits; the various kinds of fruits.

The main phenomena of the life-history (excluding microscopic processes) of common flowering-plants; germination; establishment and growth; comparison of different types of germination; the mechanism of pollination; fruit and seed dispersal.

Structure of garden-soil, different types of soil and their air and water contents; rough methods of mechanical analysis of soils.

Elementary knowledge of the chemical constituents of plants and of the sources from which the plant obtains them.

Simple qualitative and quantitative experiments illustrating the nutrition of plants, the conduction of water and food substances in the plant, storage of reserve material, respiration, transpiration, irritability.

The struggle for existence; adaptation of plants to their surroundings and to cold and drought, protection against animals; comparison of creeping-plants, rosette-forming plants, grasslike plants, shrubs, trees, and climbing-plants; the shapes of leaves and the causes to which they are due; plant societies.

The identification of common trees at different seasons by means of various parts and organs, such as buds, bark, leaves, &c.

The description and dissection of commonly occurring flowering-plants (technical descriptions will not be demanded).

A general knowledge of the following natural orders—Liliaceae, Ranunculaceae, Cruciferae, Umbelliferae, Leguminosae, Myrtaceae, Rosaceae, Compositae, Gramineae—with a special knowledge of at least one indigenous and one exotic typical member of each order.

The candidate will be required to forward, before the date of examination, a certificate in the prescribed form that he has carried out satisfactorily a course of practical work based on the above syllabus.

(17.) *Elementary Zoology* (alternative with *Elementary Botany*).

—The candidate will be expected to show that he has as far as possible acquired his knowledge of the following topics by observation and investigation: A general knowledge and comparison of the external features (*e.g.*, head, limbs, hair, feathers, teeth, beaks, hoofs, claws, &c.), the skeleton (with special reference to adaptations to support, locomotion, and prehension of food), and mode of life (*e.g.*, habitation, locomotion, food, self-protection, adaptation to surroundings) of commonly occurring mammals (*e.g.*, cat, dog, rabbit, horse, &c.), birds (*e.g.*, gull, sparrow, hawk, &c.), and fishes (*e.g.*, blue-cod, dogfish, flounder, &c.).

The general anatomy as revealed by very simple dissections only of the rabbit (as an example of a vertebrate). The form, uses, and relations to other organs of the component parts of the skeleton. The megasopic structure; the arrangement, uses, and mode of action of the nervous, circulatory, respiratory, digestive, and excretory organs.

A general knowledge of the external structure of the bony skeleton, where present, and of the mode of life, of an earthworm, a crayfish, a spider, a beetle, a honey-bee, a butterfly, a garden snail, a frog, a fish, and a bird. Comparisons should be made wherever possible. A knowledge of the chief characters of the classes to which the first seven of these animals belong and of the classes of vertebrate animals. The reference to these classes of commonly occurring members thereof.

A knowledge of the life-history subsequent to hatching of a butterfly and a frog.

Candidates may be required to recognize or describe from actual specimens or photographs any of the above-mentioned animals or typical parts of them.

The candidate will be required to forward, before the date of examination, a certificate in the prescribed form that he has carried out satisfactorily a course of practical work based on the above syllabus.

(18.) *Elementary Practical Agriculture*.—The candidate will be expected to show (*a*) that he has a practical knowledge of the operations incident to the work of a school garden, and (*b*) that he has conducted experiments and observations bearing on the life and growth of plants, on the lines indicated below under the head of experimental and observational work:—

(*a*.) Work in the garden.—General: Preparation of the land; digging, trenching, hoeing, raking, and surface cultivation. Drawing drills. Sowing. Thinning, pricking off, hardening, and planting out seedlings. Methods of treating light and heavy soils. Fertilizers; the time of year and the condition in which to apply fertilizers. The selection of fertilizers for particular purposes. Use of lime, soot, clay, road-sweepings, ashes, leaf-mould, &c., as soil-improvers. Arrangement of the garden to the best advantage from the points of view of space, succession of crops, and weeding. The application of preventives and remedies for garden pests and diseases.

Special: Methods of plant-cultivation. Cultivation and management of plants selected from one or more of the following groups:—

- (i.) Green, pod-bearing, and tap-rooted vegetables, potatoes, onions, vegetable marrows, tomatoes. Gathering and storing of vegetables.
- (ii.) Flowering-plants (annuals, perennials, and bulbs). Method of propagating flowering-plants. Succession of crops.
- (iii.) Tree and bush fruits. The care of fruit-trees. The operations of pruning, budding, and grafting.
- (iv.) Cereals and other grasses, and fodder-plants generally.

(b.) Experimental and observational work. The seed: Parts of the seed. Conditions necessary for germination and growth. Testing the vitality of seeds. The collection and preservation of seed. Experiments illustrating the phenomena of germination and the establishment of the young plant (*e.g.*, absorption of moisture by seeds; temperature of and pressure exerted by germinating seeds; how seeds escape from their covers; how seeds get buried in the soil; how young plants get above the ground, and how they deal with obstacles met with during the process; how seeds on the surface get their roots into the ground; proof that germinating seeds take in oxygen and give out carbonic acid, &c.).

The root: The function of the root. Root systems. The use of root-hairs and root-caps. Effect of injury to these parts. How roots grow. Experiments illustrating the work of roots (*e.g.*, relation between root-hairs and soil-particles; exploration of soil by roots in search of moisture; the quantity of water required by roots; use made by roots of mineral matters dissolved out of soil by water; the use of culture-solutions; proof that roots require air and give out carbonic acid, &c.).

The leaf: The general structure, forms, and functions of leaves. Seed leaves and foliage leaves compared. Transpiration. Respiration. Formation of starch. Experiments illustrating the work of leaves (*e.g.*, demonstration of the occurrence of water, air, and starch in leaves; behaviour of green leaves in sunlight and in the dark; how the rate of transpiration is controlled; the functions of the upper and lower surfaces of leaves compared, &c.).

The stem and buds: General structure and functions of stems. The "habit" of a plant. The habits of different plants compared. Twining and climbing plants. Peculiar forms of stems (*e.g.*, potato, crocus, &c.). General structure of buds. Winter buds. Bud-scales. How the growing point is protected. Influence of temperature, moisture, and light on growth. Experiments on the work of stems (*e.g.*, effect on a plant of "ringing" the stem; how the sap circulates; demonstration of the presence of starch and sugar in stems, &c.).

The flower and fruit: The parts of the flower and their functions. Causes influencing the opening and closing of flowers. Pollination. Devices for the protection of pollen, for the prevention of self-pollination, and the promotion of cross-pollination. The formation of fruits. Different types of fruits. Devices for the protection of seeds from foes. Dissemination of seeds. Experiments on cross-fertilization.

The soil: How soil is made. The mechanical analysis of soil. The texture of soil. The soil as a sponge from which a plant may obtain water, as a storehouse of plant-food, and as a laboratory in which plant-food is prepared and dissolved. Experiments with soils (*e.g.*, how moisture is held in the soil; how the moisture-holding capacity of a soil may be increased; conservation of moisture; rate of evaporation at surface of different soils; how the texture of a soil may be improved; the selection and testing of fertilizers).

The care of plants. The principles of pruning. The enemies of plants. The life-histories of the commoner animal pests. How to preserve specimens of plants.

The candidate will be required to forward before the date of examination a certificate in the prescribed form

that he has carried out satisfactorily a course of practical work based on the above syllabus.

- (19.) *Elementary Dairy Science*.—The examination will include the general properties of solids, liquids, and gases; solution; precipitation; emulsification; weighing and measuring; the balance; graduated measures; specific gravity; measurement of the specific gravity of liquids; fluid-pressure; pumps and siphons; the hydrometer and the lactometer; the effect of heat on liquids; evaporation and condensation; measurement of temperature; thermometers; the unit of heat; specific heat; latent heat; refrigeration; fermentation.

The constituents of milk; causes of variations and of defects in the composition of milk; the physical and chemical properties of milk; the coagulation of milk; the composition of skimmed milk, separated milk, buttermilk, and cream; the uses and value of separated milk, buttermilk, and whey; methods of determining the fat in milk and in its products; acidity and the estimation of acidity; sampling; the care of milk; influence of temperature on milk; pasteurizing and sterilizing milk; objections to the use of chemical preservatives; conveyance of milk; experimental proof that souring of milk is due to bacterial activity; sources of bacterial contamination; injurious bacteria of milk; milk as a medium of conveying disease.

Methods of raising and separating cream; the ripening of cream; use of starters; the process of churning; composition of butter; washing, working, and salting butter; common faults in butter.

Rennet—how prepared, its action on milk, and the determination of its strength; composition of whey; process of cheddar-cheese making; ripening of cheese, with the changes that occur and the agents at work.

The examination may include also practical work based on the foregoing syllabus.

The candidate will be required to forward before the date of examination a certificate in the prescribed form that he has carried out satisfactorily a course of practical work based on the above syllabus.

- (20.) *Elementary Home Science* (alternative with *Elementary Chemistry*).—British and metric systems of measurement. Use of squared paper. Exercises in measurements of length, area, and volume. The balance; rules for and methods of weighing. Use of measuring-glass, pipette, and U tube; how to find the relative density of solids and liquids. Flotation; principle of Archimedes; use of hydrometer and lactometer.

Expansion by heat of solids, liquids, and gases. Thermometers; conductors and non-conductors; examples of these in every-day use. How to find the melting-points of solids and the boiling-points of liquids, with special reference to materials in every-day use. Transference of heat; absorption of heat; ventilation; hot-water circulation systems. Simple experiments illustrating chemical action, the conditions that promote, check, or otherwise modify chemical action, and the difference between chemical compounds and mixtures and between physical and chemical change. Solution and the more common solvents; emulsion; crystallization.

The atmosphere; Boyle's law; the barometer; simple experiments involving air and the light thrown on its properties and composition thereby.

Simple experiments illustrating slow and rapid oxidation and the formation of oxides. A general knowledge of the occurrence in nature of carbon and its oxides.

Water; simple experiments to show the properties and composition of water. Simple experiments illustrating the preparation and properties of oxygen and hydrogen. Natural waters; hard and soft water; chief impurities of water; filters; distillation; ice and steam.

An elementary study of the properties of sulphuric and hydrochloric acids and of caustic soda and ammonia as examples of acids and alkalis respectively; simple experiments on neutralization.

The formation of salts; an elementary study of the properties of soda, borax, salt, cream of tartar, and the sulphates of copper and zinc as examples of salts.

Burning; fire and flame; smoke and soot; incandescence; elementary chemistry of a coal fire. Appliances for heating rooms, their advantages and disadvantages; why coal gas explodes; the Bunsen burner and its application to gas-stoves, &c.; oil-lamps, devices for complete combustion; electric glow lamps; wax and safety matches; the gas-meter and how to read it.

Simple experiments illustrating (a) the properties (1) on which the use for domestic purposes of the under-mentioned materials is based, (2) which render the use of them under certain conditions objectionable or dangerous: Iron (cast iron, malleable iron, steel; tinned, galvanized, and enamelled plate), copper, brass, aluminium, silver, lead, and cleansing agents in common use (soap, whitening, soda, ammonia, benzine, emery, &c.); (b) the properties of the more important materials of organic origin in common use for domestic purposes, such as fats, oils, glycerine, cane-sugar, starch, gluten, albumen, alcohol, acetic acid, and yeast. Saponification, fermentation, coagulation. Simple experiments and investigations bearing on the following topics: (1.) The composition and action of baking-powder. (2.) Changes in foods as the result (a) of the application of heat, (b) of the action of the agents of digestion. (3.) Principles on which the various methods of cooking food are based. (4.) The temperatures at which the various culinary processes are best carried out. (5.) The proportion of water in different foods. (6.) Comparison of the weight of foods before and after cooking.

The candidate will be required to forward before the date of examination a certificate in the prescribed form that he has carried out satisfactorily a course of practical work based on the above syllabus.

- (21.) *Elementary Chemistry* (alternative with *Elementary Home Science*).—Candidates will be expected to show that they have an experimental as well as a theoretical knowledge of the matters set forth in the subjoined syllabus. The three states of matter; indestructibility of matter. Physical changes compared with chemical changes. Difference between mechanical mixtures and chemical compounds. Phenomena of chemical action; conditions that promote or check or otherwise modify chemical action. The metric system; units of volume and weight and their relation; the liter. Air, its properties; the various chemical processes involving air, and the light thrown on its composition thereby. Water, its properties; solution and crystallization; purification of water; decomposition of water; elements and compounds. Production and properties of oxygen, hydrogen, and nitrogen. Slow and rapid oxidation; reduction. Estimation of the weight of an element in a given weight of one of its compounds, and of the weight of one element required to displace another from a given weight of a given compound. Modes of chemical action; direct union, displacement, mutual exchange, decomposition; combining weights; combination of elements in definite proportions by weight; combination of gases by volume. The atomic theory used to explain chemical combination; the meaning and use of symbols; formulæ and equations; simple calculations. Definitions and general properties of oxides, acids, alkalies, and bases; production and properties of chlorine and hydrochloric acid, of ammonia and nitric acid. The various forms of carbon, sulphur, and phosphorus; the production and properties of their oxides, of sulphuretted hydrogen, and of sulphuric acid (manufacture not required). The classes of salts; the properties of sodium-chloride, calcium-chloride, potassium-nitrate, sodium-nitrate, silver-nitrate, Epsom and Glauber's salts; blue, white, and green vitriol; soda crystals, bicarbonate of soda, chalk, white-lead. General properties of metals and non-metals. The preparation and properties of lime, caustic

soda, zinc-oxide, black-copper oxide, litharge, mercuric oxide.

The candidate will be required to forward before the date of examination a certificate in the prescribed form that he has carried out satisfactorily a course of practical work based on the above syllabus.

DIVISION II.

- (22) and (23). *Latin, Greek*.—Translation of easy passages, at sight, from and into the language in which the candidate is to be examined; questions in grammar limited, generally, to points arising from the passages for translation; questions involving the conversion of direct into indirect speech or *vice versa*, and the ability otherwise to vary the forms of an original passage in the language as set for translation. Generally, any passage set for translation into the language will be essentially imitative in character.
- (24) to (28). *French, German, Italian, Spanish, and Maori*.—As in Greek and Latin, but the papers not so elementary.

DIVISION III.

- (29.) *Book-keeping and Commercial Correspondence*.—The requirements will include commercial arithmetic and tots and easy précis-writing.

Book-keeping: The object and value of book-keeping. Double entry, its meaning and advantages. The form, nature, and classification of accounts. The balancing and closing of accounts. The explanation of simple commercial terms such as debit, credit, balance, profit (gross and net), interest, discount, commission, insurance, assets, liabilities, capital, bankruptcy, composition, bad debts, folio, trial-balance, company (limited and unlimited), invoice, receipt, voucher, cheque, bill of exchange. A knowledge of the transactions involved and the special terms used in connection with cheques, promissory notes, and bills of exchange. The forms and uses of the cash-book, the purchase-book or invoice-book, the sales-book or day-book, the journal, and the ledger, and methods of keeping them. Journalizing an easy set of transactions, posting the journal, taking out trial-balance, preparing profit-and-loss account, and balance-sheet. The prevention, detection, and rectification of errors.

- (30.) *Elementary Handwork I*.—Modelling in plasticine or clay, paper-work, and brick-laying.—Modelling: (a.) Modelling "balls" and "strings"; laying thin flat surfaces and cutting out various shapes therefrom; modelling simple leaves; designing, with the foregoing as elements, simple borders, patterns, and ornamental devices. The designs must show that candidates have a knowledge of the elementary principles of design, such as repetition, alternation, radiation, &c.

(b.) Modelling simple ornament in low relief from drawings, photographs, or casts. Modelling in low relief from natural objects or representations of natural objects.

(c.) Modelling in high relief, and in the round, of simple natural forms and common objects.

(d.) Modelling geographical details roughly to scale, and sample relief maps from locality plans or from photographs.

Paper-work: (a.) The use of paper-work as an aid to teaching (i) elementary geometrical notions and the elementary geometry (including areas) of the plane figures prescribed for geometrical drawing in the public-school syllabus; (ii) elementary arithmetic, including fractions.

(b.) Folding simple objects from explanatory drawings. Drawing the various stages comprised in the folding of such objects.

(c.) Designing simple geometrical borders and patterns with coloured papers either folded or cut. Elements other than those bounded by straight lines will not be required. The designs must show that candidates are acquainted with the elementary principles of design.

(d.) Preparation of courses of work and of notes of lessons suitable for classes up to and including Standard II.

Brick-laying: (a.) Describing and comparing the faces, edges, &c., of a brick and of its parts.

(b.) Describing the position of a brick, or a part of a brick, placed in various positions or forming part of a group of bricks.

(c.) Drawing on squared paper plans and elevations of bricks and parts of bricks either singly or in groups. Laying bricks and parts of bricks either singly or in groups from plans and elevations.

(d.) Designing simple borders and patterns. The designs must show that the candidates are acquainted with the elementary principles of design.

(e.) Building simple solids from drawings or from memory. Making drawings of the courses of bricks making up such solids.

(f.) Preparation of courses of work and of notes of lessons suitable for classes up to and including Standard II.

- (31.) *Elementary Handwork II.*—Cardboard-work: (a.) The use of cardboard in illustrating graphically the elementary geometry of the plane figures described for geometrical drawing in the public-school syllabus and in measuring and comparing the areas of such figures.

(b.) Cardboard parquetry, or designing simple geometrical borders and patterns with coloured cardboards. Elements other than those bounded by straight lines will not be required. The designs must show that candidates are acquainted with the elementary principles of design.

(c.) Setting out and constructing simple objects, such as trays, boxes, &c., based on the plane figures referred to in (a).

(d.) The development, construction, and mensuration of geometrical solids (including easy cases of sections of them) the surfaces of which are bounded by straight lines, or of simple objects based thereon.

Candidates may be required to draw plans, elevations, or oblique projections, and to make hand-sketches of given models or objects.

[NOTE.—For the time and other conditions of examination in the subjects of Elementary Handwork see clauses 49, 50.]

- (32) and (33).—For *Woodwork* and *Ironwork* as prescribed for the Class D certificate candidates are required to obtain a pass at the First Year's examination in these subjects as conducted in accordance with the programme of the City and Guilds of London Institute. Pamphlets containing information of the examinations held and of the programmes prescribed may be obtained on application to the Education Department.

- (34.) *Military Drill.*—For the recognition of this subject for Class D, candidates must have satisfied the examination requirements for a commission as Lieutenant in the Territorial Force as prescribed by regulations under the Defence Act, 1909, and its amendments, or have passed an equivalent examination.

PROGRAMME OF SUBJECTS—CLASS C.

60. The scope of the examination in the several subjects of Class C is here set forth.

N.B.—In any subject presented for a teacher's certificate questions may be set in examination bearing upon the method of teaching the subject.

Part I (Compulsory).

As specified in clause 59 for Groups I, II, and III of Class D.

Part II (Compulsory).

- (15.) *Principles and History of Education.*—Education as the guidance of growth; order of mental development; interdependence of the physical, mental, and moral; the nervous system; the senses and their training; training

of memory, imagination, and judgment; the muscles—their training, control, and co-ordination in relation to eye, ear, voice, hand, attention, and will; physical education in regard to health and character; interest; temperament; habit; character; child study. Physical education, aims and methods; school organization; discipline—its basis and practical aids. School hygiene: Sanitation of the school, with special reference to the disabilities and ailments of children; environment—methods and conditions of work and play essential to healthy school life; adaptation of school work and life to the physical and mental powers of the child.

The history of education, with special reference to modern tendencies and to the historical influence of the following on the formation and development of educational ideals: Plato, Aristotle, Erasmus, Ascham, Rabelais, Comenius, Milton, Locke, Rousseau, Pestalozzi, Froebel, Herbert, Bain, Spencer.

- (16.) In *English Language and Literature* a candidate will be required to give evidence of a fair knowledge of the principles of English composition, and display ability to write good English. He must also possess a knowledge of certain special books, or else of certain special books together with a period of literature. The special books and the period of literature will be chosen from time to time and duly announced.

Part III (Optional Subjects).

Division I.

- (17.) *Mechanics and Hydrostatics.*—The composition and resolution of forces acting on a point and on a rigid body on one plane; the mechanical powers; friction between two plane surfaces treated simply; the centre of gravity; the fundamental laws of motion; the laws of uniform and uniformly accelerated motion and of falling bodies; projectiles (exclusive of problems depending on the geometry of the parabola); impact; circular motion; simple pendulums; the pressure of liquids and gases; the equilibrium of floating bodies; specific gravities; the principal instruments and machines the action of which depends on the properties of fluids, with simple problems and examples.

Candidates will be expected to show an experimental as well as a theoretical knowledge of fundamental laws, but will not be expected to show any further knowledge of pure mathematics than what is demanded in subject (41), Division II, Pure Mathematics.

- (18.) *Heat and Light*—(a.) General physics: C.G.S. units, velocity, acceleration, force, weight, equilibrium, couples, energy, power, and simple pendulum. Properties of matter—Compressibility, viscosity, and diffusion of gases and liquids; absorption of gases; rigidity of solids, Hook's Law; constitution of matter, atoms, molecules.

(b.) Heat: Change of volume, measurement of temperature, specific heat, calorimetry, change of state, latent heat, hygrometry, transformation of energy, mechanical equivalent of heat; convection, conduction, radiation, and absorption.

(c.) Light: Nature, velocity; photometry; reflection and refraction at plane and spherical surfaces; thin lenses; dispersion and spectra; the principal optical instruments and vision; interference; plane polarization, and double refraction.

A candidate in Heat and Light will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (19.) *Magnetism and Electricity.*—(a.) General physics: C.G.S. units, velocity, acceleration, force, weight, equilibrium, couples, energy, power, and simple pendulum. Properties of matter—Compressibility, viscosity, and diffusion of gases and liquids; absorption of gases; rigidity of solids, Hook's Law; constitution of matter, atoms, molecules.

(b.) Magnetism and electricity: Production of charge, inverse square law, induction and distribution, electrostatic field, lines of force, potential capacity, condensers, dielectric capacity, electrometers, electrostatic machines.

Magnetic pole, inverse square law, magnetic moment, magnetic field, and lines of force, induction, permeability, terrestrial magnetism.

Magnetic force due to currents, galvanometers, Ohm's law, E.M.F., thermal effect of a current; voltaic cells and electrolysis; interaction of magnets and currents; mutual action of currents, induction coil; thermo-electricity; technical applications illustrating principles; units.

A candidate in Magnetism and Electricity will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (20.) *Chemistry.*—Candidates will be expected to show that they have an experimental as well as a theoretical knowledge of the matters set forth in the subjoined syllabus. The three states of matter; indestructibility of matter. Physical changes compared with chemical changes. Difference between mechanical mixtures and chemical compounds. Phenomena of chemical action; conditions that promote or check or otherwise modify chemical action. The metric system. Elements and compounds. Modes of chemical action; direct union, displacement, mutual exchange, decomposition. Effects of pressure and temperature on gases; Boyle's and Charles's laws. Estimation of the weight of an element in a given weight of one of its compounds, of the weight of one element required to displace another from a given compound, and of the weight of known volumes of gases. Combining weights; laws of combination of elements in definite proportions by weight; laws of gaseous combination of elements and compounds; atoms and molecules, their relative weights; the atomic theory; Avogadro's law; meaning and use of symbols, formulæ, and equations; valency; graphic formulæ; calculations of quantities by volume and by weight. Production and properties of oxygen, hydrogen, and nitrogen. Air, its properties, the exact determination of its composition; the constituents of the atmosphere; estimation of the amounts of aqueous vapour and of carbon dioxide. Water, its properties; solution and crystallization; hard and soft water; determination of the composition of water by volume and by weight; production and properties of ozone and of peroxide of hydrogen. The production and properties of chlorine, hydrochloric acid, ammonia, oxides of nitrogen, nitric acid. Definition and general properties of oxides, acids, alkalis, and bases; the basicity of acids and the classification of salts. The physical and chemical properties of the various forms of carbon, sulphur, and phosphorus; the production of the two latter on the large scale; the production and properties of the oxides of the three elements just named; the production and properties of sulphuretted hydrogen, of bisulphide of carbon, of sulphurous and sulphuric acids (manufacture not required), of phosphoretted hydrogen, and of meta-, pyro-, and ortho-phosphoric acid. Experimental determination of the composition of hydrochloric acid, ammonia, carbon dioxide, sulphuretted hydrogen. The halogens, their physical and chemical properties compared; the production of iodine on the large scale; the combinations of the halogens with hydrogen. The sources and the physical and chemical properties of arsenic, antimony, and bismuth. The more important compounds of these elements, with special reference to their relation to phosphorus. The detection of arsenic. The sources and the physical and chemical properties of boron and silicon; the more important compounds of these elements. General properties of metals and non-metals. The chief methods of isolating and the physical and chemical properties of sodium,

potassium, ammonium, silver, calcium, zinc, magnesium, copper, mercury, tin, lead, manganese, and iron; the properties of their more important compounds. The production and properties of the following carbon compounds, with special reference to processes of substitution, oxidation, and reduction, the meaning of constitutional formulæ, and the evidence on which they are constructed, and the characters of homologous series: the homologous paraffins treated as a series, ethylene, acetylene, methyl and ethyl alcohols, formic acid, acetic acid, and their relations to one another.

A candidate in Chemistry will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (21.) *Physiography*.—(a.) Forms of matter; units of length, area, volume; quantity of matter; specific gravity; law of Archimedes. Measurement of time; its relation to the earth's rotation. Velocity; force, resultant of forces. Centre of gravity. Measurement of angles; angular velocity; "centrifugal force." Energy; forms of energy. Heat and temperature; expansion by heat; thermometers; conduction and convection. Radiation; reflection and refraction; the spectrum; the rainbow; sunset effects. Chemical composition of matter; mixtures and compounds; air and water; oxygen, nitrogen, carbon, iron, mercury, carbon dioxide, lime, silica, alkalies, common salt. Rain, dew, snow, hail, ice. Magnetism; mariner's compass; variation of the needle; magnetic poles of the earth. Earth's crust; minerals; rocks, stratified and unstratified. The chief forms of animal and vegetable life; fossils; succession of geological strata.

(b.) The earth's form; the horizon; the earth's dimensions and density; rotation of the earth on its axis. Latitude and longitude as angles and as arcs. Distance of earth from sun; dimensions and density of sun. Inclination of earth's axis; variation of length of day and night; the four seasons. The north and south line; the sun-dial; altitude of the sun; methods of determining latitude and longitude; great circles, small circles. The moon; lunar and solar eclipses; tides. The solar system; planets and "fixed stars"; law of gravity. Maps, how constructed; the conical, equidistant, and Mercator's projections; scale of map, contour lines; great-circle sailing; rhumb-line sailing. The atmosphere; isothermals; rainfall; dew point; winds, land and sea breezes, steady winds, cyclones, seasonal winds; Ballot's law; isobars. Climate, circumstances affecting climate. The earth's crust, its folding, faulting, movements slow and sudden. Work of rain, ice, rivers, and the sea. Distribution of plants and animals.

N.B.—The candidate will be expected to show that, as far as possible, he has acquired his knowledge of the subject by actual experiment, observation, and measurement, but will not be expected to show any further knowledge of pure mathematics than what is demanded in subject (41), Division II, Pure Mathematics.

A candidate in Physiography will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (22.) *Geology*.—Form and size of the earth, general chemical constitution of the crust; elements of crystallography and the classification of minerals, the principal rock-forming minerals and metallic ores, macroscopic characters and minute structure of rocks; classification of rocks according to their nature, composition, and mode of origin; volcanoes and volcanic action; earthquakes, secular movements of the crust; metamorphism; the geological effects of air, water, and living organisms; stratification, joints, inclination, and curvature of rocks; cleavage; faults; unconformity; mode of occurrence of igneous and

metamorphic rocks; surface-features due to disturbance, volcanic action, and denudation.

An elementary knowledge of the chief orders of plants and the chief orders of animals that are represented in Australasian fossils. Geographical distribution of animals and plants in relation to geology, chronological classification of rocks, geological eras, and the characteristic fossils of the geological periods. The general geological structure of New Zealand, including the broader features of the chief systems of rocks, and the most characteristic genera (only) of fossils. Recognition of a well-known mineral or of a common rock from specimens or from descriptions.

A candidate in Geology will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (23.) *Botany*.—General: (1.) The general structure and life-history of the following organisms, to illustrate certain general biological phenomena and laws:—Haematococcus, Spirogyra, yeast, bacteria, Amoeba, a ciliate infusorian, a fern, a flowering-plant, Hydra or any hydroid polyp. (2.) General structure and physiology of the cell; the general facts of nuclear division and cell-division. (3.) Principles of classification. (4.) Origin of species, heredity and variation, struggle for existence, use and disuse, degeneration, rudimentary and vestigial organs, modifications for protection and aggression, natural selection, production of varieties, connection between ontogeny and phylogeny. (5.) The bearing of the main facts of geographical and geological distribution on the theory of evolution.

Special: (1.) The general morphology of the cells, tissues, and organs of plants. (2.) The physiology of plants, including the knowledge of simple experiments. (3.) The structure and life-history of the following types: Nostoc, Pleurococcus, Volvox, Vaucheria, Closterium, a stonewort, a diatom, Hormosira or any fucoid, any red Alga, Mucor, Saprolegnia, Penicillium, Peziza, Agaricus, any lichen, Marchantia, any moss, Selaginella, a conifer, liliium. (4.) The classification of plants and the characters of the chief subdivisions of the vegetable kingdom. The principal characters of the following orders: Liliaceæ, Amaryllidaceæ, Iridæ, Orchidæ, Gramineæ, Salicineæ, Polygonæ, Ranunculaceæ, Cruciferae, Geraniaceæ, Umbelliferae, Myrtaceæ, Rosaceæ, Leguminosæ, Labiatae, Scrophularineæ, Solanaceæ, Primulaceæ, Campanulaceæ, Compositæ.

A candidate in Botany will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (24.) *Zoology*.—General: (1.) The general structure and life-history of the following organisms, to illustrate the biological phenomena and laws, referred to in the succeeding sections: Haematococcus, Spirogyra, Mucor or other mould, yeast, bacteria, Amoeba, a ciliate infusorian, Hydra or any hydroid polyp, frog. (2.) General structure and physiology of the cell; the general facts of nuclear division and cell division. (3.) General structure of the simple tissues in animals; arrangement of tissues into organs and systems of organs. (4.) General phenomena of nutrition, circulation, respiration, and excretion in animals. (5.) Elementary physiology of muscle and nerve. (6.) General phenomena of reproduction, sexual and asexual, in animals. (7.) General phenomena of development in animals. (8.) Principles of classification. (9.) Origin of species, heredity and variation, struggle for existence, use and disuse, degeneration, rudimentary and vestigial organs, modifications for protection and aggression, natural selection, production of varieties, connection between ontogeny and phylogeny. (10.) The bearing of the main facts of geographi-

cal and geological distribution on the theory of evolution.

Special: (1.) The general characters of the following phyla: Protozoa, Porifera, Coelentera, Turbellaria, Trematoda, Sestoda, Annelida, Echinoderma, Anthropoda, Mollusca, Chordata. (2.) The structure and life-history of the following types: Sea-anemone or any antinozoan, starfish, fluke, tape-worm, earthworm, crayfish, cockroach or any insect, a lamellibranch, snail or any gastropod, a simple ascidian, amphioxus, a dogfish, frog, rabbit. (NOTE.—The skull of the dog may be studied in place of that of the rabbit.) (3.) The mode of formation of the germinal layers in a hydroid, starfish, earthworm, crayfish, amphioxus, frog, bird, rabbit, and the mode of formation of the embryonal membranes in the bird and rabbit. (4.) The life-history of typical insects, such as fly, bee, moth.

A candidate in zoology will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (25.) *Physiology and the Structure of the Body.*—The chief differences between animals and plants, especially as regards nutrition. The animal cell and its more important modifications. Structure of bone and of cartilage; the principal bones of the human skeleton, their arrangement and functions; structure of the principal joints. Muscles, their structure, mode of attachment, and functions, with a knowledge of the principal muscles that give form to the human body. The structure and functions of the vocal organs. The alimentary tract and the functions of alimentation. The lymphatic system. The heart and the circulatory system in general, including the physical composition and functions of the blood. Respiration and the respiratory organs. Glands, especially those concerned in alimentation; secretion in general; excretion and excretory organs. Structure and function of the kidneys. The skin and its functions. A general knowledge of the central nervous system, with a knowledge of a few of the principal nerves and of the principal forms of nerve-endings; afferent and efferent nerves; reflex action and nerve functions in general. The sympathetic nervous system. The organs of sense, especially the ear and the eye. Practical histological work will not be demanded, except in so far as the preparation, without the use of the microtome, of unstained tissue for microscopical examination is concerned. The paper will be so framed as to discover, by practical tests or otherwise, whether the candidate has actually dissected some readily available mammal, as the rabbit, dog, or sheep.

A candidate in Physiology will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (26.) *Domestic Science I.*—Household Chemistry: Study of sugars, starches, glucose, fibres, fats and oils, proteids, extractives, mineral matter or ash, water, volatile products; separation of the most commonly occurring carbohydrates, proteids, and fats; testing of flour, meal, cereals, sugar, syrup and molasses, edible oils and fats, butter, milk, meats, tea, coffee, cocoa, wines, &c., baking-powder, vinegar, spices, burning-oils, coal, water, soap, bluing, bleaches, &c.; examination of tin, galvanized, and enamelled ware for lead and arsenic; the effect of alkalies and organic acids on bright and tarnished metals such as copper, zinc, iron, &c. Certificate of practical work as prescribed under (28), Domestic Science III (last paragraph).
- (27.) *Domestic Science II.*—(a.) Food production and manufacture: Questions based upon the following course: The preparation of the various staple foods from the raw state to the finished product in marketable form, including the composition, nutritive value, and cost of the

available materials—*e.g.*, fruits, vegetables, sugars, meats, edible oils, dairy products, tea, coffee, chocolate, alcoholic beverages, spices and condiments; the processes of drying, salting, smoking, canning, and preserving, together with the question of adulteration and substitution. The laboratory work consists of physical and chemical tests to indicate the composition, purity, and availability of the product. The economic value of the material is ascertained by test.

(*b.*) Food-preparation: Questions based upon the following course: The preparation of food materials based on a knowledge of their composition and the chemical changes effected by heat and moisture, the relative value of cooking processes in retaining nutritive principles in most digestible form, (*i.*) especially the methods of preparation best suited to available forms of a given food material. (*ii.*) Study of recipes, to determine how they carry out these principles, and economize material, fuel, and labour; the adaptation of established recipes, domestic and foreign, to new-process food materials; the grouping of recipes according to their type forms. (*iii.*) Study of the psychological and physiological effect of pleasing flavours; attractiveness and variety in serving; methods of accomplishing these results with a minimum of labour and expense. (*iv.*) Cost of food and marketing. (*v.*) Discussion of materials and recipes suitable for school use. Certificate of practical work as prescribed under (28), Domestic Science III (last paragraph).

(28.) *Domestic Science III* (two papers). — (*a.*) Nutrition and Dietetics: Questions based upon the following course: The practical aspects of nutrition and the money-values of food. Diets for individuals, families, and institutions under normal and abnormal conditions of health and environment; the family dietary; the feeding of infants, children, adults, the aged; institutional and special diets for public and private institutions, college dormitories, school lunch-rooms, restaurants, hospitals, and asylums, and special diets for the sick.

(*b.*) Domestic Hygiene: The house as a factor of health—sanitation, surroundings, plan and construction, ventilation, heating, drainage, plumbing, lighting, furnishing, water-supply, cleansing, general sanitary conditions from a practical and scientific standpoint. Home art. Personal hygiene (apart from food questions); clothing, work, and rest, suitable occupations; care of the body; exercise; laundering. Home nursing and emergencies.

(*c.*) Household Economics: The organization of the home and its adaptation to modern conditions; systematic methods of housekeeping; the cost of living; household accounts; domestic service.

Candidates in each of the branches of Domestic Science will be required to forward to the Department, before the examination, a certificate on the prescribed form that they have gone through a sufficient course of practical work (or of practical work and observation) in the subject occupying not less than eighty hours if one branch is taken, not less than 160 hours if two branches are taken, and not less than 240 hours if three branches are taken.

(29.) *General Agriculture*. — Candidates will be expected to show that they have a practical as well as a theoretical knowledge of the matters set forth in the subjoined syllabus. What agriculture is; objects of the farmer; aid given by allied sciences. The soil—how soil is made, the contents of the soil; organic and inorganic constituents; plant-food in soil; nitrifying bacteria; classification of soils; relation of the soil to the plant; transportation of soil; examination of soils; indications determining the nature of a soil and its agricultural value; the texture of soil; causes of barrenness and of exhaustion of soil; the importance of good soil and how to obtain it. Value of drainage and irrigation; method of carrying out these operations. Importance of moisture in soil; how water is held in the

soil; how the capacity for moisture in the soil may be increased; the conservation of moisture, indications that land needs draining. Tillage—its effects on soil; methods and implements for tillage. The enrichment of the soil and the object of it; farm resources, their value and management. Classification, composition, properties, and management of manures; indications determining the selection of manures; soils and crops for which manures are best suited. The plant in its relation to soil, climate, animal life, and man; how the plant lives; the factors of growth; the food of plants, how and whence plants procure food; root-distribution. How plants are propagated; importance of a good seed-bed and of good seed; seed-testing; preparation and care of the seed-bed. How plants adapt themselves to, and are influenced by, their surroundings. The chief characters, management, and care of the principal crops; selection of suitable soils and situations; rotation of crops; objects of grafting and pruning; enemies of plants, preventives and remedies; intertillage of crops; eradication of weeds. Making new kinds of plants.

A candidate in General Agriculture will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (30.) *Dairy Science*.—The constituents of milk; causes of variations and of defects in the composition of milk; the physical and chemical properties of milk; the coagulation of milk; the composition of skimmed milk, separated milk, buttermilk, and cream; the uses and value of separated milk, buttermilk, and whey; acidity and the estimation of acidity; sampling; influence of temperature on milk; pasteurizing and sterilizing milk; objections to the use of chemical preservatives; experimental proof that souring of milk is due to bacterial activity; sources of bacterial contamination; injurious bacteria of milk; milk as a medium for conveying disease. The examination will include also a knowledge of the construction, manipulation, and principles of working of the apparatus used for testing milk and its products. Methods of raising and separating cream; the ripening of cream; use of starters; the process of churning; the composition of butter; washing, working, and salting butter. Rennet—how prepared, its action on milk, and the determination of its strength; composition of whey; process of cheddar-cheese making; ripening of cheese, with the changes that occur and the agents at work. Chief breeds of dairy cows; anatomy and physiology of the cow in so far as bearing on nutrition and milk-production; principles involved in breeding dairy cattle. Care and management of dairy cows and of calves; food-crops; other animals as economic adjuncts to a dairy-farm; the commoner diseases of cows—parturient apoplexy (milk-fever), septic metritis, contagious mammitis, contagious abortion and sterility, tuberculosis, variola (cowpox); selecting and judging dairy cattle; improvement of the dairy herd; milk and butter-fat yields. General principles to be observed in the construction of buildings used in connection with dairying—farm-buildings, creameries, and butter-factories—with a knowledge of their equipment and its uses; care of milk; conveyance of milk. Dairy legislation in New Zealand; sale of milk; adulterations in milk and its products; defects in butter and cheese; an elementary knowledge of book-keeping for dairy-farms and factories.

The examination may include also practical work based on the foregoing syllabus.

A candidate in Dairy Science will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (31.) *Agricultural Chemistry*.—The atmosphere, rain, dew, and their composition.

Soils: The origin, formation, and mechanical analysis of soils; the physical properties of soils; the chemical and physical properties of the constituents of soils; the effects on soils of weathering, of vegetable and animal life, and of tillage; the oxidation of organic matter in soils; the active or available and the dormant or reserve soil-constituents; the conditions necessary for the formation of the active from the dormant constituents, or promoting this formation.

Manures: Definition of manures; the principles governing their use; the properties and composition of the chief general, artificial, and manufactured manures; fermentation.

Plants: The organic and inorganic constituents; the proportions of water and solid matter. The ash of plants; the essential, non-essential, and useful ash-constituents; differences in composition between the ash of grain and that of straw or leaf. General composition of farm crops; chemical elements in the plant obtained from the air and from the soil; chemical actions in different parts of the plant; effects of light and heat; chemical changes during germination.

Animals: Chief organic and inorganic constituents of animal bodies; ash-constituents of blood, muscle, and bone; composition of fats; the general composition and values of ordinary farm foods and their uses in the animal body. The constituents of milk, cream, butter, and cheese.

A candidate in Agricultural Chemistry will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (32.) *Agricultural Botany and Zoology.*—The elementary morphology, anatomy, and physiology of plants; the functions of the members of the plant; pollination and fertilization; formation of seed; adaptations for protection and dispersal of seed; germination and growth; storage of food; general conditions of plant-life; contention with physical environment; competition with fellows; variation. Description of gymnosperms used for timber in New Zealand, and of cryptogams that are parasitic upon higher plants and upon animals of economic value, with methods of prevention and cure. Classification of phanerogams, with special reference to those orders to which the more important trees, grasses, plants, weeds, &c., with which the agriculturist is concerned, belong. The recognition, description, reference to their orders, and uses of such trees, &c. The prevention and destruction of weeds, with a special knowledge of impurities and adulterants, and the determination of the germinating power of seeds. The chief characteristics, geographical distribution, and general conditions of existence in respect to those orders of the animal kingdom to which the animals (including those injurious to agriculture) that are of economic importance to agriculturists belong. A knowledge of the external features, general structure, and mode of life of such animals. The means of destroying animals injurious to agriculture, or of holding them in check.

A candidate in Agricultural Botany and Zoology will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

- (33.) *General Hygiene.*—Composition, characters, and classification of drinking-waters. Sources of water-supply. The collection, storage, and distribution of water; constant and intermittent systems of water-service compared. Sources of contamination, and protective precautions; the more common impurities of water. The examination of samples of water for impurities; estimation of hardness; effects of impure and insufficient supplies. Large scale and domestic methods of filtering and purifying water; construction and action of water-filters. Compo-

sition, properties, and impurities of air; chemical and microscopical examination of samples of air for impurities. Quantity of fresh air required under varying conditions; air-space around and in buildings; overcrowding. Principles and methods of ventilation; natural and artificial ventilation compared. Effects of respiration and combustion upon composition of air. Classification and relative value and digestibility of foodstuffs. General principles of diet; quantity of each class of food required; energy obtainable from food. Standard diets. Care and preservation of food; putrefaction and fermentation; parasites introduced in food. Adulteration of food; methods of detecting adulteration. Methods and appliances for cooking food; general composition and dietetic value of meat, fish, bread, vegetables, fruit, milk, butter, cheese, eggs, tea, coffee, cocoa, condiments, sugar, and fermented beverages; brewing. Origin, composition, and classification of soils; moisture, air, and heat of soils; selection of building-sites; climate, temperature, sunshine, humidity, winds; properties of materials used in construction of various parts of a building; cause and prevention of damp; floor and wall coverings; methods and appliances for heating and lighting buildings. Materials and principles of clothing for children and adults. Disposal of surface and rain water, of excreta and house-refuse; construction and laying of drains, drain-testing; effects of sewer-gas; disinfectants, antiseptics, and deodorizers. Cleanliness, and attention to action of skin and bowels; use of soap; exercise; care of eyesight; rest, sleep. Influence of temperament, habits, idiosyncrasy, and heredity. Infection and disinfection. Parasites. The bearing of vital statistics on questions of public hygiene.

A candidate in Hygiene will be required to forward to the Department, before the examination, a certificate on the prescribed form that he has gone through a sufficient course of practical work in the subject occupying at least eighty hours.

Division II.

- (34) to (40).—In *Languages other than English* candidates will be required to show reasonable proficiency in translating from and into the language chosen; to show a knowledge of certain special books; and to answer questions in grammar arising out of the special books. In each language one or more special books will be prescribed from time to time and duly announced. At least one of the passages set for translation from the language shall be taken from a special book so prescribed, and part of the work set for translation into the language shall be based upon the vocabulary and diction of one of such prescribed special books.*

Questions may also be set to test an elementary knowledge of a period in the national or literary history, as may from time to time be specified in the announcement relating to special books.

- (41.) *Pure Mathematics*.—Every candidate must be provided with a ruler graduated in inches and tenths and in centimeters and millimeters, a small set-square, a protractor or scale of chords, compasses with pencil-point, and a fine pencil. Tables of logarithms will be supplied.
- (a.) *Arithmetic*: Contracted and approximate methods of multiplying and dividing numbers, so as to omit all unnecessary figures; use of rough checks, especially with regard to the position of the decimal point; use of such expressions as 1.732×10^4 for 17320, and 1.732×10^{-3} for .001732. Meaning of a common logarithm; use of logarithmic tables of four or five figures. Calculation of numerical values from formulæ. Working of problems in practice, interest, &c., by decimals; use of squared paper, and application of graphical methods to arithmetical problems.

* The provisions relating to special books shall not, until further notice, apply to Maori.

A knowledge of the arithmetic and mensuration included in the programme of the Class D examination as set out in clause 59, Group I, paragraph (3), will be assumed.

(b.) Algebra: Definitions and explanations of algebraical signs and terms; addition, subtraction, multiplication, and division of algebraical quantities, including easy fractions and easy surds (the candidate will not be expected to show skill in the manipulation of complicated formulæ, but he may be required to ascertain accurately the numerical value of any quantity or expression given to him); square root; the elementary rules of ratio and proportion; easy equations of a degree not higher than the second, and questions producing such equations; easy arithmetical and geometrical series; graphs of simple algebraic functions within the limits of the foregoing work, and graphical methods of solving equations.)

(c.) Geometry: Schedules A and B (practical and theoretical geometry) as in the D certificate examination, clause 59, Group I, paragraph (4), together with the following:—

SCHEDULE C (PRACTICAL).

To draw a normal to a plane from an external point.

Projections of a point on three planes at right angles.

Determination of a point by means of its co-ordinates (x, y, z), referred to three rectangular axes and by means of its polar co-ordinates.

Projection of a straight line on a plane making a given angle with it.

Projection of a plane figure on a plane making a given angle with it.

Development of the right prism, and of the right pyramid.

Determination of the surface, the base being a regular polygon, of the right prism and right pyramid.

Volume of the prism and pyramid.

The generation of the right circular cylinder, right circular cone, and sphere by revolution.

Development of the right circular cylinder, and right circular cone; the surface of each.

Volume of the cylinder, cone, and sphere.

SCHEDULE D (THEORETICAL).

If a straight line is drawn parallel to one side of a triangle, the other 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 their 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.

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

In equal circles (or in the same circle) the ratio of any two angles at the centre or of any two sectors is equal to the ratio of the arcs on which they stand.

(d.) Trigonometry: Degrees and radians; use of protractor or scale of chords; trigonometrical functions and their fundamental relations; determinations of their value by graphical methods and setting-out of angles when the value of the sine, cosine, or tangent is given. Approximate solution of right-angled triangles and oblique triangles by drawing to scale; tracing of trigonometrical functions through the four quadrants; arithmetical values of the trigonometrical functions of 30° , 45° , 60° , 75° , 90° , &c. Formulæ for finding the sine, cosine, and tangent of the sum or difference of two angles

(excluding angles greater than two right angles), and easy derived formulæ; the sine rule in triangles, or $\sin A/\sin B = a/b$, and other simple properties of triangles; the area of a triangle. Use of natural and logarithmic tables of sines, cosines, and tangents of four or five figures. Solution of triangles; heights and distances.

Skill in the transformation of trigonometrical expressions or in the manipulation of formulæ will not be required except in so far as it is implied in the above syllabus.

- (42.) *Economics*.—(a.) The general economics of the production, consumption, distribution, and exchange of wealth; the law of population; emigration and immigration; problems of industrial organization; over production; monopolies and combinations; proposed remedies for low wages; trade unions; strikes; land tenures; land nationalization; land rating and taxation.

(b.) The more fundamental treatment of—Money, credit, interest, the banking functions, international trade, foreign exchange, balance of trade, freetrade and protection, preferential trade, economic functions of government, socialist theories, State and municipal socialism, State regulation of labour, and labour disputes.

Division III.

- (43.) *General History*.—Outlines of general history from 1815 to 1890, with special reference to the main lines of the social and political development of the Great Powers of Europe and the United States of America and Japan; the partitioning of Africa; and the establishment and development of colonies by European Powers.

- (44.) *English Constitutional History*.—(a.) Outlines of the British Constitution from 1485, including a general knowledge of the leading cases in Constitutional Law and of the chief constitutional documents.

(b.) A general knowledge of the present working of the Constitution, including the constitutional relations between the United Kingdom and oversea dominions, colonies, and dependencies.

- (45.) *Economic History* (one paper).—The outlines of the industrial and commercial development of Great Britain, the questions being mainly chosen so as to deal with the period subsequent to 1760, and to include—The effects of the introduction of machinery upon industry and trade; changes in industrial organization; the development of transport, and the distribution of products; the economic effect of the Napoleonic wars; movements of foreign trade; the effects of protective tariffs upon production and distribution; trade-unionism and its effects in raising or lowering the standard of wages and industrial efficiency; the influence of the co-operative movement; the rise and growth of large companies and trusts; the growth of banking; the adoption of the gold standard; and the history of general prices.

- (46.) *Logic, Deductive and Inductive*.—Doctrines of terms, including the predicables, division, and definition; doctrine of the judgment, including the forms of immediate inference; doctrine of the syllogism; the fallacies; causation and the uniformity of nature; observation and experiment; *inductio per enumerationem simplicem*; analogy; the inductive methods; hypothesis; classification.

- (47.) *Psychology*.—Scope and method of psychology; classification of mental elements; the outlines of the physiology of the nervous system; body and mind; consciousness and self-consciousness; sensation; perception; representation; laws of association; memory; imagination; conception; judgment; reasoning; thought and language; attention; apperception; human and animal intelligence; space and time; illusions. The general laws of feeling; pleasure and pain; the relations between cognition, feeling, desire, and will; motives, habit; character; the freedom of the will.

- (48.) *Economic Geography*.—Longitude and latitude; great circles, small circles; standard and local time; construction and scale of maps; climate, including rainfall and winds; the division of the world into natural and economic regions; geographical factors controlling the production and exchange of commodities, especially the

chief foods and food stuffs, minerals, and raw materials, and the staple manufactures; distribution of the chief economic plants and animals; factors encouraging or hindering trade.

The paper shall have special reference to Great Britain, to New Zealand, to Australia, and the Pacific Islands, and to America—dealing with the chief geographical and local conditions under which commodities are produced and distributed; with the chief trade-routes and means of transit; with currencies; with social and political conditions affecting or likely to affect trade with New Zealand; with ports or harbours, coaling-stations; the chief post and telegraph routes; the distribution of population, of minerals, of forests, and of vegetable products; the necessary conditions of development in manufactures, agriculture, and commerce; the distribution of industries.

- (49.) *Accounting*.—The object and value of book-keeping; the form, nature, and classification of accounts; tabular and columnar book-keeping; self-balancing systems; consignment accounts, account sales and accounts current; average due date; partnership, and an elementary knowledge of executorship and trustee accounts; statements of affairs and deficiency accounts; preparations of accounts from single-entry books, and conversion of single-entry books into double entry; manufacturing, trading, and profit and loss statements of trading concerns, and the passing of all entries connected therewith; branch accounts; a general knowledge of the nature of capital, debentures, stocks, shares, and of company book-keeping.
- (50) and (51.) For *Woodwork* and *Ironwork* candidates are required to produce the certificate of the City and Guilds of London Institute (second year) in the subject taken. Pamphlets containing information of the examinations and the programmes prescribed may be obtained on application to the Education Department, Wellington.
- (52.) *Military Science*.—No examination will be held by the Department, but a candidate who has gained a certificate of proficiency for the subject in the University of New Zealand, or has satisfied the examination requirements for the commission of captain in the Defence Forces, will be held to have passed in this subject as for the Class C or Class B certificate.
- (53.) (a.) For *Dressmaking* candidates are required to produce the certificate of the City and Guilds of London Institute in the subject.
- (b) and (c). For the branches of *Elementary Handwork* included under these headings the programme and the examination are the same as for the Class D certificate. (See clause 59, paragraphs (30) and (31).)
- (d) and (e). *Woodwork* and *Ironwork*, as for Class D. (See clause 59, paragraphs (32) and (33).)
- Pamphlets containing information of the examinations conducted for the City and Guilds of London Institute and the programmes prescribed may be obtained on application to the Education Department, Wellington.
- (f.) *Military Drill*, as for Class D. (See clause 59, paragraph (34).)

J. F. ANDREWS,
Clerk of the Executive Council.