

1885.  
NEW ZEALAND.

## EDUCATION: EXAMINATION OF TEACHERS.

[In Continuation of E.-1A, 1884.]

*Presented to both Houses of the General Assembly by Command of His Excellency.*

The INSPECTOR-GENERAL of SCHOOLS to the Hon. the MINISTER of EDUCATION.  
SIR,— Education Department, Wellington, 30th June, 1885.

I have the honour to report on the result of the seventh annual examination for certificates as follows:—

There were thirteen centres of examination, of which two were in the Auckland Education District. The number of candidates was greater than in any previous year, and the proportion of successful candidates higher than ever before; and the improved proportion is not confined to any one class of candidates, nor can it be said that the examination was made easier than usual. Out of 721 candidates who entered their names, 633 were present at the examination; and of these, 409—or 64·6 per cent. of the number present—were either successful or “partially successful.” The “partially successful” are those whose work was generally good, but who failed to some extent in not more than two subjects each: they number 146. The number of those who have satisfied the examiners for certificates of Class D or Class E, or for promotion from Class E to Class D, is 263. Further particulars appear in the following table:—

	Auckland.	Taranaki.	Hawke's Bay.	Wanganui.	Wellington.	Marlborough.	Nelson.	Westland.	North Canterbury.	South Canterbury.	Otago.	Southland.	Totals.
Entered for Class D .. .. .	42	..	2	10	19	2	11	2	30	1	49	8	176
Of whom—Present at examination .. .. .	37	..	..	9	18	2	10	2	28	1	45	6	158
Passed for Class D .. .. .	8	..	..	1	4	2	1	1	6	..	14	1	38
Partially successful for Class D .. .. .	11	..	..	..	8	..	5	..	13	..	13	..	50
Partially successful for Class E .. .. .	1	..	..	..	1	..	..	..	..	..	..	..	2
Partially successful for Class D and completed examination for Class E .. .. .	1	..	..	..	1	..	..	..	4	..	1	2	9
Completed former examination for Class E .. .. .	4	..	..	3	1	..	..	..	2	..	11	1	22
Entered for Class E .. .. .	86	19	13	20	11	7	13	13	56	6	66	14	324
Of whom—Present at examination .. .. .	77	17	10	20	9	5	11	12	50	4	61	13	289
Passed for Class E .. .. .	15	1	2	1	1	4	..	3	19	2	27	2	77
Partially successful .. .. .	26	3	3	5	4	..	2	6	22	1	21	1	94
Entered to complete former examination .. .. .	56	5	4	15	12	..	5	4	51	9	49	11	221
Of whom—Present .. .. .	50	3	4	13	11	..	5	4	43	6	38	9	186
Successful .. .. .	26	1	3	10	6	..	2	3	31	5	24	6	117

Total number of candidates who entered, 721. (Number in 1884, 660.)

Total number present, 633. (In 1884, 592.)

Total number of candidates who improved their position, 409, or 64·6 per cent. of the number present. (In 1884, 56·2.)

The list of “passes” which accompanies this report is not a mere reprint of the original notice in the *Gazette* of the 1st of May, but includes names of candidates whose cases could not be satisfactorily decided without correspondence extending beyond the date of the *Gazette*.

I append a set of the examination papers, except those relating to drawing, music, and needlework.

The cost of the examination was £595 9s. 3d., against which is to be set the sum of £496, received as candidates’ fees.

By an unfortunate oversight, two questions were included in the History-paper for Class D which bore on events not embraced by the period prescribed by the Regulations. Great care was, however, taken to insure that no candidate should lose marks through spending, in answering these two questions, time that he might have employed advantageously in other ways.

The Examiner in Drawing reports that “In Practical Geometry, a good many of the candidates showed a sufficient knowledge of the subject, but failed through sketching the figure freehand, and not showing the proper method of construction. It is very desirable that all the construction-lines be left in.”

Several candidates this year have made the mistake of supposing that, because it has been the custom to record “partial pass” in favour of one who does not fail in more than two subjects, they were at liberty to abstain from presenting themselves for examination in one or two subjects in which they felt themselves to be weak. To prevent a repetition of the mistake—which has occasioned a great deal of troublesome correspondence, and would have caused great disappointment had you not dealt very generously with those who made it—a distinct notice has been added to the form of “Directions to Candidates,” stating that absence from any part of the examination will involve failure for the whole.

The *Gazette* of this day’s date contains the list of certificated teachers, as it is affected by the annual revision which has just taken place. The number of such teachers is now 1,614; on the 30th of June, 1884, the number was 1,403. The number of teachers and assistants (not including pupil-teachers) engaged in the public schools, at the end of last year, was 1,657, as against 1,561 at the end of 1883, so that probably the number is now 1,700, with a tendency to increase at the rate of 100 a year; while the number of certificated teachers is only about 1,600, but has a tendency to increase at the rate of 200 a year. There are 93 licenses now current as against 83 a year ago.

I am sorry to find that the change of date ordered by a recent Regulation will bring the next examination of teachers almost into conflict with the entrance examination of the University. As the matriculation examination for the last two years began on the 8th and 10th of December, it was hoped that the new Order in Council, which requires that the department’s examination be held between the 14th and the 24th of December, would not cause any inconvenience to candidates intending to present themselves both for matriculation and for the certificate examination. I shall do all in my power to arrange the department’s examination so as to make it possible to attend both examinations, but I fear that in some cases the attempt will fail. I hope that all candidates will see the importance of giving notice by the 15th of September, the day fixed for that purpose by the Regulations.

I have, &c.,

WM. JAS. HABENS,

Inspector-General of Schools.

The Hon. the Minister of Education.

## LIST OF PASSES, ETC.

An asterisk against a name signifies that the candidate is too young to hold a full certificate.

## I. PASSED THE EXAMINATION FOR CLASS D.

**Auckland**—  
 Bell, May E. M.  
 \*Burton, Frank P.  
 Dyer, Robert C.  
 Hockin, Harry.  
 Hogwood, James.  
 McPherson, Robert.  
 May, Thomas L.  
 Westwood, Clara B.  
**Wanganui**—  
 Dowling, Richard E.  
**Wellington**—  
 Fairbrother, Thomas F.  
 Morgan, Margaret.  
 \*Searle, Constance C.  
 Watson, Tellira C.  
**Marlborough**—  
 McCallum, Robert.  
 Tissiman, William.  
**Nelson**—  
 Cooke, Minnie S.  
**Westland**—  
 Malcolm, James Porterfield.  
**North Canterbury**—  
 Blake, Alexander C.  
 Guiney, Samuel P.  
 Low, Annie M.  
 McCormack, Caroline M.  
 \*Ryder, Robert B.  
 Wicks, William H.  
**Otago**—  
 \*Allan, Flora M.  
 Barnett, Abraham M.  
 \*Garron, James M. E.  
 \*Little, Alice M.  
 \*McMillan, Hugh.  
 \*Moir, James.  
 Neill, Robert.  
 \*Parlane, James.  
 \*Pinder, Edward.  
 Pope, Langley.  
 \*Scott, Mary.  
 \*Tennant, John S.  
 \*Thomson, William.  
 \*Walker, Kate.  
**Southland**—  
 Strack, Conrad A.

## II. PASSED THE EXAMINATION FOR CLASS E.

**Auckland**—  
 Beattie, Thomas.  
 Cranwell, Jessie.  
 \*Davis, Francis J.  
 \*Flavell, Dennis R.  
 Gilbert, Alice L. F.  
 Gilmer, Mary S.  
 Harrower, Christina.  
 Horgan, Anna S.  
 \*Hougham, Charlotte H.  
 Kennedy, Neil H.  
 \*May, William J.  
 Morice, Jeanie A.  
 \*Newton, William H.  
 \*Smith, Martha.  
 \*Whitelaw, Margaret.  
**Taranaki**—  
 Drake, Annie E.  
**Hawke's Bay**—  
 \*Laws, Charles H.  
 \*Teychenné, Adah L.  
**Wanganui**—  
 \*Rogers, Edward H.  
**Wellington**—  
 \*Cook, Isabella M.  
**Marlborough**—  
 \*Bary, Mary.  
 \*Prichard, Gladys.  
 \*Stratford, Edythe A.  
 \*Wrigley, Mary.  
**Westland**—  
 \*Stevenson, Andrew.  
 Taylor, Marion E.  
 \*Voysey, William.  
**North Canterbury**—  
 \*Andrews, Constance R.  
 Bennetto, Emily A.  
 Brace, Thomas F.

## North Canterbury—continued.

\*Chapman, Margaret.  
 \*Cross, Eleanor G.  
 \*Dohrmann, Adelaide.  
 Giles, Thomas H.  
 \*Guise, Eliza E.  
 Irvine, Martha.  
 \*Menzies, Jessie.  
 \*Patrick, Hannah M. M.  
 \*Spence, Mary L.  
 \*Unwin, Elizabeth A.  
 \*Waby, Mary C.  
 \*Watkins, Ernest J.  
 West, Jane St. H.  
 Wethey, Harriett E.  
 Willis, Eliza M.  
 Woodward, John C.

## South Canterbury—

\*McGowan, Mary.  
 \*Meredith, Marion.

## Otago—

Bastings, William E.  
 \*Bayley, Amelia E.  
 \*Beattie, James M.  
 Borthwick, James.  
 \*Chisholm, John.  
 \*Church, Robert.  
 Cowie, Marion B.  
 Dale, Selina J.  
 \*Darton, Laura J.  
 \*Evans, Emma J.  
 \*Fleming, James.  
 Fleming, Janet.  
 \*Fowler, Lillian E.  
 Gibson, Mary A.  
 \*Golding, Jabez.  
 \*Grant, Ritchings.  
 \*Gunn, John E.  
 \*Islip, Mary.  
 \*Jack, James A.  
 \*Moodie, John.  
 \*Sherriff, Eliza G.  
 Smith, Ethel R.  
 \*Stone, Louisa M.  
 Stuart, Mary.  
 \*Thompson, Alicia M.  
 \*Thomson, Grace I.  
 \*Wright, Grace M.

## Southland—

\*Jaggers, Annie E. M.  
 \*Townsend, Edith M.

## III. PARTIAL SUCCESS RECORDED TOWARDS CLASS D.

**Auckland**—  
 \*Blades, Ellen.  
 Chapman, Thomas H.  
 Escott, Harriet E.  
 McIver, Margaret C.  
 Ridings, Kate.  
 \*Schnackenberg, Katrina E.  
 Scott, John L.  
 \*Smith, Isabella.  
 Smyth, Charles T.  
 Sumner, John W.  
 \*Thompson, Georgina A.  
 \*Wilson, Janet.  
**Wellington**—  
 \*Dowdeswell, Adelaide Augusta.  
 \*Jacobsen, Henrietta.  
 Joplin, Charles Reesby.  
 \*Lawson, Mary K.  
 McKenzie, Christina.  
 Palmer, Mary.  
 Reeves, Mary E.  
 \*Saywell, Thomas R.  
 Scale, Charlotte F.  
**Nelson**—  
 Bakewell, Frederick H.  
 Bakewell, Robert J.  
 Gascoigne, Mary Catherine Helen.  
 Knapp, Frederic V.  
 Roby, John.  
**North Canterbury**—  
 \*Aldridge, Emily R.  
 \*Alpers, Oscar T. J.  
 Ansley, Annie.  
 Baird, John H.  
 \*Baldwin, Kate.  
 \*Bourke, Charles.

**North Canterbury—continued.**

Collins, Edward James Bruges.  
Currie, Susan.  
\*Dick, Janet.  
\*Duncan, Mary.  
Durey, Fanny.  
Guiney, Samuel P.  
McCullough, Samuel.  
\*McGregor, John W.  
Mahood, John J.  
Robinson, Sarah L.  
Tomlinson, Thomas E.

**Otago—**

Botting, John F.  
\*Callender, Mary.  
\*Chalmer, Agnes E.  
Davidson, George.  
\*Fullarton, Catherine J.  
\*Gordon, Rebecca.  
\*Howorth, Alfred.  
\*McDonald, Margaret.  
McDonald, William.  
\*Mills, Maria.  
Randle, Howard.  
Robertson, John A.  
\*Ross, Annie M.  
\*Thompson, Lillie.

**Southland—**

Lindsay, Alexander.  
\*McNeil, Duncan.

**IV. PARTIAL SUCCESS RECORDED TOWARDS CLASS E.****Auckland—**

\*Ashman, Emma.  
\*Bell, Laura.  
Booth, Frederick.  
Calvert, Joseph.  
Carter, James Roby.  
Collins, Minnie.  
Fletcher, Kate A.  
Flower, William M.  
Harris, Mary J. M.  
Jones, Thomas A.  
Kidd, Marion.  
McIntosh, William N.  
Macky, Mary A. F.  
\*Murray, Elizabeth B.  
\*Patterson, Elizabeth R.  
\*Pearson, Clara J.  
Reid, George B.  
\*Robertson, Constance L.  
Ryan, Arabella C.  
\*Smart, Jane A.  
Smith, Catherine S.  
Tinling, Alexandrina.  
\*Trimnell, Margarita M. S.  
Tristram, Margaret E. M. T.  
Walter, Charles A. W.  
Wilson, Henry B.  
\*Wolff, Rosabell.

**Taranaki—**

Cliff, Annie E.  
\*Henderson, Lorens.  
\*McLauchlan, Mary.

**Hawke's Bay—**

\*Arrow, Amy W.  
\*Baty, Mary A. J.  
\*Heslin, Charles.

**Wanganui—**

Espinier, George H.  
Hoey, Margaret.  
\*Igglesden, Olive M.  
McNeill, Elizabeth A.  
Nye, George.

**Wellington—**

Heaney, Lillias E. E.  
\*Howan, Ellen J.  
Mason, Francis.  
\*Treadwell, Laura A.  
\*Wallace, Ellen.

**Nelson—**

Bright, Mary E.  
Hood, Marion C.

**Westland—**

Bromley, John A.  
\*Ecclesfield, Eva.  
Patrick, William A.  
\*Pelling, Mary A.  
Robertson, Frederick H.  
\*Robinson, Elizabeth M.

**North Canterbury—**

\*Andrew, Albert W.  
\*Barclay, Fanny.  
\*Bishop, Martha L.

**North Canterbury—continued.**

\*Brown, Charlotte E.  
Buckley, Eugene C.  
Catterick, James W.  
\*Duncan, Robena.  
Easther, Henry A.  
Granger, Pressy E.  
\*Hiatt, Sara F.  
Hodgson, Ada.  
Keand, Annie.  
\*Patrick, Eleanor E.  
Perkins, Clara C.  
\*Pickering, Elizabeth A.  
Prosser, Hannah E.  
Ryan, Margaret W.  
\*Shirtcliffe, Mary S.  
\*Smith, Sarah E.  
\*West, Helen R.  
Wilkinson, Henry R.  
Williams, Helen V.

**South Canterbury—**

Hamilton, Hugh R. W.

**Otago—**

\*Albert, Sarah E.  
\*Annett, Alice.  
\*Bell, Robert.  
\*Cameron, Mary (Lawrence).  
\*Cameron, Mary (Dunedin).  
\*Campbell, Jane.  
\*Cottle, Mary E.  
\*Dippie, Margaret.  
Geddes, Emilie S.  
Giffedder, Michael.  
\*Harland, Margaret.  
Hollow, Franklin.  
Kelk, Henry P.  
\*Loudon, Mary.  
McCreedy, William.  
\*MacGregor, Helen.  
\*Murray, Hannah B.  
Robertson, Jane.  
Sutherland, James.  
\*Symons, Bessie.  
\*Truman, Annie R.

**Southland—**

Millard, Arthur J.

**V. PASSED IN THE SUBJECTS REQUIRED TO COMPLETE FORMER EXAMINATION.****Auckland—**

Bischoff, Adelaide.  
Blackman, Alice.  
Blyth, William H.  
Bowen, Rosanna.  
Boyd, Catherine.  
Bright, Aimée D.  
\*Brook, Julian.  
Crowe, Richard.  
Davis, Charles B.  
Davis, Elizabeth.  
Draffin, William H.  
Fellows, Mary A.  
Fraser, Julia M. M.  
Fraser, Lucy St. M. M.  
\*French, James M.  
Gill, Esther M.  
Hopper, Charlotte A.  
Kilfoyle, Leonora.  
\*Lamb, Minnie.  
Macky, Helen B.  
Marsdon, Annie M.  
Martin, Elizabeth.  
Mulvany, Norah M.  
Murray, William T.  
Ross, Hubert N.  
Smith, Margaret A.  
Taylor, Florence.  
Thompson, Georgina A.  
Thompson, Harriett W.  
Thwaites, George.  
Tregear, Mary C.

**Taranaki—**

\*Hamerton, Annis Eliza.

**Hawke's Bay—**

Evers, Marie E. L. H.  
Monteith, Jane.  
Robottom, Emily D.

**Wanganui—**

Coventry, Harry.  
Dillon, Maria H.  
\*Goodisson, Mary  
Guylee, Joseph.  
Honoré, Jacob.  
\*Macdonald, James

Wanganui—*continued.*

McWilliam, Mary A.  
Matheson, Alexander.  
Maunder, George H.  
Parkes, Frank B.  
Parkinson, Henry A.  
Twisleton, Henry L.

\*Wilding, Mary J.

## Wellington—

Bethune, Finlay.  
Browne, Emily M.  
Cherrett, Jessie.  
\*Corbin, Annie M.  
Craig, Maggie H.  
Elkin, Sarah.  
Flux, Mary.  
Reeves, Mary E.

## Nelson—

Bryant, William H.  
Peart, Frederick B.

## Westland—

Kemple, Frances M.  
Ralfe, Jessie Sugden.  
Scott, Edward A.

## North Canterbury—

\*Boulton, Gertrude E.  
Bramley, Arthur.  
Callender, Helen.  
Cole, Minnie U.  
Cooke, Jean Laird.  
\*Cooper, Arthur.  
Craddock, Annie M.  
Cross, Henry.  
\*Duncan, Mary.  
Durey, Fanny.  
Eastwood, Jane.  
Gates, Thomas Adkisson.  
Guiney, Samuel P.  
Ick, Mary F.  
Jaggar, Edith J.  
Johnson, Emily J.  
Kingston, Laura E.  
McCabe, James.  
\*McGregor, John W.  
McHarg, Elizabeth A.  
Marr, Thomas M.  
Merton, George H.  
Murdoch, John.  
Phillips, Leonora M.  
Ross, Margaret L.  
Rowley, Jane G.  
Shepherd, Ellen M.  
Speight, James.  
Stewart, Jessie.  
\*Taylor, Frances.  
Webber, Abel.  
\*Weir, Martha.  
Whitelaw, George.

North Canterbury—*continued.*

Wilcox, Alice M.  
Wilkinson, Edmund.  
Williams, Florence R.  
Wilmot, George.

## South Canterbury—

Bennet, Isabella W.  
\*Brown, Bertha.  
Ferguson, Jane C.  
\*Mackay, Jessie.  
Pearson, Mia Owen.

## Otago—

\*Allan, Orlanno L.  
Beattie, John.  
Braik, George D.  
Bushell, Bessie.  
Cairns, Jessie.  
\*Christie, Jessie C.  
Darton, Annie.  
\*Ferguson, Mary A.  
Fraser, Mary J.  
Fraser, Windsor G.  
\*Hilgendorf, Francis.  
Huie, Robert.  
\*Johnstone, Cecilia.  
Macdonald, Agnes.  
\*McDonald, Margaret.  
\*McLaren, William.  
McLauchlan, David L.  
\*McLauchlan, Joseph.  
\*McLeod, Robina A.  
\*McNaught, Thomas.  
McQueen, Margaret.  
Mills, John.  
Morris, James F.  
Nicol, Alexander M.  
\*Nimmo, Eliza J.  
Palmer, Arthur E. A.  
Rix, James A.  
Robertson, John A.  
\*Ross, Annie M.  
Scott, Michael H.  
Stewart, Robert.  
Tregoning, Mary.  
Valentine, James A.  
Waddell, James N.  
\*Wilson, John.  
\*Winchester, Alice.

## Southland—

Gazzard, Thomas E.  
Gray, John.  
\*Joyce, James F. P.  
Kelly, John.  
Lindsay, Alexander.  
\*McNeil, Duncan.  
Mehaffey, John.  
Sebo, William H.  
\*Todd, Helen T.

## EXAMINATION PAPERS.

## CLASS E.—ENGLISH GRAMMAR.

1. Define the terms *adjective*, *intransitive verb*, *compound relative pronoun*; and give an example of each.
2. Give the rules for forming the possessive cases of nouns, and write down the possessive singular and objective plural of *wife*, *lord*, *lady*, *mayor*, *hero*.
3. Mention three distinct methods of distinguishing the masculine and feminine genders of nouns. Give the masculine of *niece*, *mamma*, *doe*; and the feminine of *bull*, *bullock*, *gentleman*.
4. What *single* word may be used for *king* or *queen*, *son* or *daughter*? Of what gender would such words be?
5. What are the differences between the words *who* and *which* in the sentences: *Who* wrote the letter? *Which* letter did he write?
6. What parts of speech may each of the following words be? *Table*, *close*, *but*. Write a short sentence to illustrate each use of them.
7. Adjectives can be compared (1) fully, (2) partially, or (3) not at all. Give one example of each.
8. State the principal ways in which the past tense indicative active is formed. Give the first person plural of this tense of the verbs *smile*, *fling*, *win*, *shoot*; and the present participle active of the verbs to which belong *fled*, *went*, *lay*.
9. Explain the terms *adjective sentence*, *adverbial sentence*. Make use of the words *scholar*, *lesson*, *learn*, as leading parts of a sentence of your own, which must contain (1) an *adjective sentence*, and (2) an *adverbial sentence* of *time*.
10. Form (1) diminutives from *leaf*, *deer*, *pup*; (2) adverbs from *graceful*, *silly*; (3) abstract nouns from *sick*, *high*; (4) adjectives from *fear*, *rag*; (5) verbs from *able*, *friend*.

11. What are the force and origin of *ster* in *spinster*, *ey* in *clayey*, *post* in *postpone*, *ance* in *vigilance*, *dia* in *diagonal*, *peri* in *perimeter*?

12. Analyse—

I did send  
To you for gold to pay my legions,  
Which you denied me.

Parse fully the words in italics.

13. Write out the words dictated by the Supervisor.

14. Write and punctuate carefully the passage dictated by the Supervisor.

#### CLASS E.—EXERCISE IN DICTATION AND SPELLING.

(Part of a Paper on English Grammar and Composition.)

1. Spelling exercise:

Bazaar, nuisance, ascetic, harangue, victualler, rhubarb, wrench, solemn, woful, contagious, illiterate, assail, bouquet, envelope.

2. Dictation:

"The stranger who would form a correct opinion of the English character, must not confine his observation to the metropolis. He must go forth into the country; he must sojourn in villages and hamlets; he must visit castles, villas, farmhouses, cottages; he must wander through parks and gardens, along hedges and green lanes; he must loiter about country churches, attend wakes and fairs, and other rural festivals, and cope with the people in all their conditions, and all their habits and humours.

"In some countries the large cities absorb the wealth and fashion of the nation: they are the only fixed abodes of elegant and intelligent society, and the country is inhabited almost entirely by boorish peasantry. In England, on the contrary, the metropolis is a mere gathering-place, or general rendezvous, of the polite classes, where they devote a small portion of the year to a hurry of gaiety and dissipation, and, having indulged this carnival, return again to the apparently more congenial habits of rural life."—WASHINGTON IRVING.

#### CLASS E.—ARITHMETIC.

1. Multiply one million six hundred and ninety-eight thousand and twenty-six by forty-seven thousand three hundred and seventy-six, and write down the answer in words. Verify the result by the method of "casting out the nines."

2. Express the pressure of the atmosphere, which is  $14\frac{3}{4}$  lb. per square inch, in tons per square yard.

3. Multiply 14 ac. 13 p. 12 sq. yd. 13 sq. in. by  $142\frac{2}{3}$ .

4. Make out a bill for the following articles: 19 yards of Mosgiel cloth at 3s. 3d. per yard, 17 yards of lining at  $5\frac{1}{2}$  d. per yard, 112 yards of braid at 2s.  $7\frac{1}{2}$  d. per dozen yards, 5 dozen buttons at 6s. 6d. per gross.

5. Find, by Practice, the value of 25 cwt. 3 qr. 17 lb. at £6 17s. 8d per cwt.

6. A schoolroom is 21 feet 4 inches long and 16 feet 6 inches broad: how many children can it accommodate, allowing 8 square feet for each child? What must be the height of the room so as to allow for each child a space of 110 cubic feet?

7. Add together  $\frac{5}{11}$ ,  $\frac{7}{11}$ ,  $\frac{9}{11}$ , and express the result as the fraction of  $1\frac{6}{11}$ .

8. Explain your method of determining the position of the decimal point in division of decimals. Divide .3125 by .000128, and .000128 by .3125. Account for the fact that both quotients are finite decimals.

9. Find the value of £71875 + 16.375 of 3s. 4d. — 1.3416 of £1 10s.

10. A grocer bought two qualities of tea at 2s. 4d. and 1s. 8d. per lb., and mixed them in the proportion of 2 lb. of the former to 5 lb. of the latter: how much will he gain per cwt. by selling the mixture at 2s. 6d. per lb.? Find also his gain per cent.

11. A clock gains 3 min. 9 sec. per week: by how much per cent. is its rate too fast?

12. It is known that the volume of a gas is proportional directly to its absolute temperature and inversely to its pressure, and it is observed that a mass of air occupies one cubic foot when its absolute temperature is 300°, and its pressure is 15 lb. per square inch: find its volume when its absolute temperature is 450°, and its pressure 18 lb. per square inch.

13. The capital of a firm has been contributed by the three partners as follows: A £1,200, B £1,800, C £3,000; and it is agreed that the active partners, A and B, shall receive 20 per cent. and  $13\frac{1}{3}$  per cent. respectively of the gross profits, for their services in the business. If the gross profits amount to £1,500, what will be the share of each of the partners?

#### CLASS E.—GEOGRAPHY

1. Give the reasons which induce us to believe (a) that the earth is nearly spherical in shape, (β) that it rotates on its axis once in twenty-four hours.

2. A traveller comes to New Zealand by way of San Francisco, and returns by way of Melbourne, Suez, and Brindisi. Mention the countries, seas, &c., through which he would pass, and the ports at which he would probably call.

3. Draw a map of Europe, and mark the names of the inlets and of the islands near the coast.

4. Explain the situation of the following places: Corea, Kalahari Desert, the Deccan, Yucatan, Alleghany Mountains, Pamir Plateau, Soudan, Harz Mountains, Valdai Hills, Lake Peipus, Kurile Islands, Balearic Islands.

5. Where in New Zealand are the following places: Kaipara, Riverton, Westport, Kawhia Harbour, Pelorus Sound, Masterton, Waimate, Ruapehu, Patea, Jackson's Bay, the Nuggets, Tauranga?

6. Write a brief account of the more important physical features of Australia.
7. Give the boundaries of the following countries, and give four towns in each country : Italy, Arabia, Canada, Chili, Sweden, Afghanistan.
8. Give the names of the chief political divisions of Africa ; give the position of each division, and its important towns.

#### CLASS E.—ENGLISH HISTORY.

1. Give a short sketch of the Long Parliament.
2. Tell what you know of Cromwell's campaigns in Ireland and Scotland.
3. Describe and account for the feelings and attitude of the Dutch towards the English after the execution of Charles I.
4. Give the names and the dates of the last three Stuart Sovereigns.
5. What is the darkest blot on the reign of William III. ? Give a brief account of it, with any defence that can be offered of William's action in the matter.
6. State the cause, the length, and the results of the War of the Spanish Succession.
7. What was the main object of each of the following legislative enactments : The Toleration Act, the Reform Act, the Abolition of Slavery Act ?
8. Describe Napoleon's schemes for the humiliation of England.
9. What entitles the following names to a lasting and honourable place in the history of their country : Marlborough, Newton, General Wolfe, Warren Hastings, Adam Smith, Nelson, and Stephenson ?
10. Give a succinct account of the discovery and the establishment of the several Australasian Colonies, and of the development of their trade.
11. Name three standard writers in prose and verse of the present century down to the accession of Victoria.

#### CLASSES D AND E.—SCHOOL MANAGEMENT.

[N.B.—Answer one question in each section, and one only.]

##### SECTION I.

1. Construct a time-table suitable for a school of forty pupils taught by one teacher and grouped in four standard classes, with two classes of infants. Show as far as possible how the pupils at desks are employed.
2. Construct a time-table suitable for an infant department containing sixty pupils, having three classes of infants and a class in Standard I., and one in Standard II. ; the staff being a mistress and a pupil-teacher.
3. [N.B.—This question may be taken only by teachers actually in charge of a department of a public school containing one or two classes. The name of the public school must be given.] Give the time-table in use in your department, and explain the principles on which it is drawn up.

##### SECTION II.

1. (a.) What registers have to be kept in every public school ? State why they are required. (b.) Why is it advisable in all cases of absence to record the absence by a mark in the proper column, instead of leaving the space blank ?
2. A school has been open seventy-nine half-days in a quarter ; the total of half-day attendances is 1,648 ; on twenty-four of the half-days the attendance was below half the roll-number, and amounted to a total of 213. Find the strict average, and also the working average.

##### SECTION III.

Draw up full notes of a lesson on any one of the following subjects. The lesson is to occupy thirty minutes :—

- (1.) The causes and effects of ocean currents. (Standards V. and VI.)
- (2.) A trip from Auckland to the Bluff, with references to places of interest. (Standard IV.)
- (3.) A boy's coat. (Standards I. and II.)
- (4.) The process of gold-saving and -extraction as practised in the colony. (Standards III. and IV.)
- (5.) The principle that "heat usually causes a vertical circulation in fluids," to be educed from a number of familiar examples. (Standards IV. and V.)

##### SECTION IV.

1. Explain clearly how you would teach a reading-lesson to a class preparing for Standard I. What qualities should good reading show at this stage ?
2. Explain clearly how you would teach an English lesson (including reading and explanation of the thoughts and language) to a class preparing for Standard IV. Explain how you would encourage and test preparatory study of the lesson by the pupils.

##### SECTION V.

1. A young teacher, in taking the parsing of "They lived happily for several years," works it out as follows : "They," a pronoun, stands for something ; "lived," a verb, says something ; "happily," an adverb, tells how ; "for," a preposition, shows relation ; "several," an adjective, tells the number. Criticise the method here followed, and the nature and sufficiency of the account here given of the use of the words.
2. (a.) A junior class can give the definition of a strait, but cannot point one out on the map : what faults of method does this state of things indicate ? (b.) How would you lead a class in Standard II. to understand what a river is ?

3. Write down half a dozen very simple examples that would serve as an introduction to the Rule of Three, and show how you would educe the rule from the examples.

## SECTION VI.

1. (a.) What are the objects of punishment? (b.) What are the chief punishments you would employ? (c.) Under what restrictions would you use corporal punishment?

2. What means would you employ for maintaining attention? Give the more important causes of inattention.

## SECTION VII.

1. How would you apply the principle, "Proceed from the particular to the general," in teaching the simple rules of syntax in grammar?

2. What steps would you take to encourage honesty and independence of work?

3. "The acquisition of knowledge should be a source of pleasure." Describe the chief conditions that must be complied with to secure this result.

## SECTION VIII.

What lessons can be best prepared at home? How far are home lessons beneficial to the pupil and helpful to the teacher?

## CLASSES D AND E.—ELEMENTARY SCIENCE.

[NOTE.—Candidates are not to attempt more than twelve questions. Female candidates, if proficient in Needlework, may substitute for this paper the paper on Domestic Economy and the Laws of Health; but passing in Science will not exempt them from passing in Needlework also.]

1. Name the mechanical powers. Sketch a set of pulleys in which 1 lb. balances 6 lb.
2. How is the specific gravity of a substance lighter than water ascertained?
3. Explain the action of a balloon.
4. What are the laws of motion? Why are fly-wheels used in machinery?
5. Name the forces of nature, and state the laws of gravitation. If a planet were twice as heavy as the earth and half the diameter, what would one pound weigh on a spring-balance on its surface?
6. What experiments would you make to prove that a musical note consists of a regular series of impulses of the air?
7. Show by diagrams how an image is produced in a plane and a concave mirror respectively.
8. Make a sketch showing the structure of the eye, and name the several parts.
9. Describe the formation of dew. How is the dew-point ascertained?
10. What is the difference between boiling and evaporation?
11. What are the chief experiments that may be made to illustrate the properties of a bar-magnet?
12. How may an electric current be generated?
13. What are the more important phenomena that may be produced by an electric current?
14. How is it proved that the earth is a magnet?
15. Describe the chemical changes that occur in the burning of a candle.
16. When is water said to be hard?
17. What is the cause of the rusting of metals? Which are the metals that rust most easily? and which do not rust at all?
18. Describe the mechanism of breathing. Why do we breathe?
19. Make a sketch illustrating the course of the circulation of the blood.
20. How does a plant get its food?

## CLASSES D AND E.—DOMESTIC ECONOMY AND LAWS OF HEALTH.

[NOTE.—This paper is for female candidates who are proficient in Needlework, and, in consideration of this, are allowed, if they prefer it, to be examined in Domestic Economy and the Laws of Health, instead of in the general subject of Elementary Science. See the note on the Elementary Science paper.]

1. What are the different ways of warming a room? Discuss the advantages of each.
2. What are the disadvantages of a house being on soil that is saturated with water?
3. Why is it necessary that drinking-water should be pure?
4. Make sketches showing how drain-pipes and sinks may be "trapped" so as to prevent the ingress of bad gases.
5. What are the usual effects of overwork upon children?
6. What are the relative advantages of grilling and frying a mutton-chop?
7. State what you know of various systems of ventilation.
8. Why is breathing necessary? What is the difference between air inspired and expired?
9. What precautions would you take to prevent an infectious disease from spreading?
10. Describe the skin, and state its functions.

## CLASS D.—ENGLISH GRAMMAR AND COMPOSITION.

[Each section must be attempted.]

1. Parse the italicized words, and discuss anything peculiar in their grammatical functions: (a) O! not like me; for mine's beyond *beyond*; (b) A little more than a *little* is by much too *much*; (c) It has done *enough* for me; (d) Thou shalt not *steal*; (e) Peeping from forth their alleys green; (f) The seeds of it are *sowing*; (g) For she loved *much*; (h) A man *off* his guard; (i) The *off* horse; (j) I tell thee *what*, man, it is true; (k) Fifteen *minus* one is fourteen; (l) Fare *you* well; (m) As many as I love I rebuke; (n) *Order*, gentlemen, order! (o) Twice a year; (p) Anything that is in heaven *above*; (q) The tree is known by *his* fruits; (r) Is your father *well*? (s) He proclaimed my rights and *yours*.



2. In each of the following sentences a word is inaccurately used: point it out, substitute the correct word, and explain why it is correct: (a) When asked his opinion about the day's proceedings he remarked that he had had a most delicious excursion into the serener region of speculation; (b) If the Commons do not agree to the amendments a conference usually follows between members constituted from each House; (c) The consequences of allowing the French to establish themselves in Scotland are prognosticated with great accuracy; (d) The picture, the critic said, was beautiful in its colouring and sublime in its proportions; (e) As we read through "Paradise Lost" we feel that it is the fancy of the poet which is impressing us with the grandeur of the conceptions; (f) He followed the footmarks of the hunter through the forest, but at last, after crossing a marsh, he could not find a vestige of them; (g) Please attend to this whilst I go downstairs; I shall be back in a few instants; (h) By looking at the context and considering the whole circumstances in which the passage was written, he divined the meaning of the word; (i) The wood was so dense with its undergrowth and masses of creepers that it was quite impassable to the rays of the sun.

3. Rewrite the following so as to avoid the ambiguities, inelegances, awkward rhythms, and intricate and ill-balanced clauses. The words and order may be changed, but no idea of the original is to be omitted. "He told His Majesty that, since he thought his behaviour to be so bad in that particular, for which till then his own conscience or discretion had not reproached him, he must and did believe he had committed a great fault, for which he did humbly ask his pardon, and promised hereafter no more to incur his displeasure for such excesses, which he could never have fallen into at that time and upon that occasion but upon the presumption that it had been impossible for His Majesty to have made that interpretation of it which it seems he had done, or that anybody could have credit enough with him to persuade him to believe that he desired that His Majesty should not have a clear view and the most discerning insight into the darkest and most intricate parts of all his affairs, which they knew in their conscience to be most untrue."

4. Outline an essay on the merits and faults of any *one* well-known English poem. Write out the introduction and conclusion in full; but in the main part of the essay give only the main ideas, numbering them in logical order, and under each of these arrange the subordinate ideas in logical order.

5. Write out the words dictated by the Supervisor.

6. Write out and punctuate carefully the passage dictated by the Supervisor.

#### CLASS D.—EXERCISE IN DICTATION AND SPELLING.

(Part of a Paper on English Grammar and Composition.)

1. Spelling exercise:

Phalanx, novitiate, paralytic, diphtheria, successful, dilettante, chloroform, chameleon, brunette, millionaire, pamphleteer, sibylline, silhouette, mustachioed, isinglass, hygiene, gnostic, schism, onomatopoeia.

2. Passage for dictation:

"Imagine her—it is always good to imagine a human creature in whom bodily loveliness seems as properly one with the entire being as the bodily loveliness of those wondrous transparent orbs of life that we find in the sea—imagine her with her dark hair brushed from her temples, but yet showing certain tiny rings there which had cunningly found their own way back, the mass of it hanging behind just to the nape of the little neck in curly fibres, such as renew themselves at their own will after being bathed into straightness like that of water-grasses. Then see the perfect cameo her profile makes, cut in a duskish shell where by some happy fortune there pierced a gem like darkness for the eye and eyebrow; the delicate nostrils defined enough to be ready for sensitive movements, the finished ear, the firm curves of the chin and neck entering into the expression of a refinement which was not feebleness."—GEORGE ELIOT.

#### CLASS D.—ARITHMETIC.

1. The area of a rectangular strip of ground is two thousand five hundred and twenty-seven acres and six thousand two hundred and three square links: if its breadth is seven thousand five hundred and sixty-nine links, find its length.

2. The dimensions of a brick are 9 in. by  $4\frac{1}{2}$  in. by  $2\frac{1}{4}$  in. If  $\frac{1}{4}$  in. be added to each of these dimensions to make allowance for the mortar, how many bricks will be required to build a wall 111 yd. long, 9 ft. 6 in. high, and 1 ft. 3 in. thick?

3. Divide 652 ac. 3 r. 18 p.  $28\frac{3}{4}$  yd. by  $46\frac{3}{8}$ .

4. Find, by Practice, the value of 17 lb. 2 oz. 17 dwt. 12 gr. of silver at £3 11s. per lb.

5. A rectangular hall is twice as long as broad, and twice as broad as high: find its dimensions, having given that the cost of covering the floor with linoleum at 4s. 3d. a square yard came to £42 10s. Find also the cost of plastering the walls and ceiling at 3s. 8d. per square yard, after deducting one-sixth of the area of the walls as an allowance for doors and windows.

6. If unity be divided into two parts, of which the one part is equal to  $\frac{3}{4}$  of  $\frac{5}{6}$  of  $(2\frac{1}{2} - 1\frac{3}{5})$ , find the other part. Show that the difference of the two parts is equal to the difference of their squares.

7. Simplify  $\frac{22\cdot4}{\cdot75} + \frac{\cdot62}{\cdot016} - \frac{8\cdot18}{\cdot24}$ .

8. Taking the pressure of the atmosphere to be 14·73 lb. per square inch, express this pressure in grammes per square centimetre. [1 lb. = 453·6 gm.; 1 in. = 2·54 cm.]

9. Air consists of 20·9 per cent. oxygen and 79·1 per cent. nitrogen by volume, and of 23·1 per cent. oxygen and 76·9 per cent. nitrogen by weight: compare the weights of oxygen and nitrogen with the weight of an equal volume of air taken as unity.

10. Find the value of  $\sqrt{2} - \sqrt{2}$  to five places of decimals.
11. If 12 men, working 10 hours a day for 12 days, can dig a trench 470ft. long, 6ft. wide, and 5ft. deep, in what time can 108 men, working 8 hours a day, form a railway cutting containing 78,020 cubic yards?
12. Show how the true discount on a bill is calculated. Find the true discount on a bill of £2,460, due 55 days hence, at  $7\frac{1}{2}$  per cent.
13. A person holding £14,350 New Zealand  $4\frac{1}{2}$ -per-cent. stock sells out at 105, and with the proceeds purchases Exchequer bills, bearing interest at the rate of 8s. 9d. per cent. monthly, when the bills are at a premium of £2 10s. per cent. Find the alteration in his income.
14. Wheat is quoted in London at £2 15s. per quarter, and in Antwerp at 26 francs per hectolitre; freight to London is 5s. per quarter, and to Antwerp 2 francs per hectolitre; and exchange with London is  $1\frac{1}{2}$  per cent., and with Antwerp  $2\frac{1}{2}$  per cent. Determine to which of these ports a grain-dealer should consign his wheat, and what he will thereby gain per quarter. [£1 = 25·26 francs; 1 quarter = 2·908 hectolitres.]

## CLASS D.—GEOGRAPHY.

1. What is meant by the phrase “meridian altitude of the sun”? Explain how by observation of the meridian altitude of the sun the latitude of a place may be determined. If a place is in latitude  $45^\circ$ , what will be the meridian altitude of the sun in midwinter, and what in midsummer?
2. Write an account of the lake and river systems of North America.
3. Explain carefully the positions of the following places in or near New Zealand: French Pass, the Three Kings, Jackson’s Bay, Queen Charlotte Sound, Akaroa Harbour, White Island, Castle Point, Preservation Inlet, Kawhia Harbour, Hauraki Gulf, the Solander, Mercury Island.
4. Describe the physical features of Scotland.
5. Where in Ireland are the following places: Cape Clear, River Boyne, the Lakes of Killarney, Valentine, Macgillicuddy Reeks, Lough Neagh, Drogheda Bay, Giant’s Causeway, River Shannon?
6. Draw a map of Europe: mark off as accurately as you can the boundaries of the various countries in it, and insert three important towns in each country.
7. Where are the principal deserts in the world situated? Give any characteristics of each which you may be acquainted with.
8. Name the chief countries of Asia, giving the boundaries of each, and the principal towns of each country.

## CLASS D.—ENGLISH HISTORY.

1. Outline the history of the idea of the “divinity” of kingship in England.
2. How did William the Conqueror deal with the Jews?
3. Give an account of the military, judicial, and ecclesiastical reforms of Henry II.
4. Compare the character of Henry III. and that of Simon of Montfort.
5. Why have the clergy retained no share of representation in the Lower House of Parliament as they have in the Upper?
6. Describe the struggle between capital and labour under the first three Edwards.
7. Had the destruction of Lollardism any evil effect on the civilization of England?
8. Sketch the history of the Court of High Commission.
9. Give an account of the Solemn League and Covenant, the circumstances that led to it, and the results that followed.
10. When and how did the names of Whig and Tory arise, and how did they change their significance?
11. What legislation in Anne’s reign revealed the intolerant spirit of the Tories?
12. Give an account of the case of John Wilkes and its importance in parliamentary history.
13. Give a brief history of the anti-slavery movement.
14. How was electoral reform brought about in 1832?

## CLASS D.—GREEK (Optional).

1. Give the genitive and dative singular and plural of *άνήρ, γυνή, χείρ, γένος, βασιλεύς, ναύς, κάρα*. Write out in full the plural of *τοιούτος*.

2. Parse *ᾠλετο, ἰέσθων, παθόντες, θέτω, πέπωκε, ἴστω*. Give the first person singular of the tenses most commonly used of *δράω, ἔρχομαι, ἔχω, θνήσκει, ἔσθίω, αἰρέω*.

3. Give rules for the use of the accents. What is meant by the so-called grave accent? Place the proper accents upon the words contained in the following sentence: *οἱ μὲν δὴ στρατηγοὶ οὕτω ληφθέντες ἀνῆχθησαν ὥς βασιλεὺς καὶ ἀποτμηθέντες τὰς κεφαλὰς ἐτελευτήσαν.* Distinguish by their accents—*ἄλλα, ἀλλά· ποῖον· ποῖων· τιμήσαι, τίμησαι, τιμήσαι· βασιλεία, βασιλεία.*

## 4. Translate—

*Εγὼ δέ σοι δίδωμι ἐμᾶντὸν καὶ τοὺς ἐμούς· τοὺτους ἐταίρους φίλους εἶναι πιστοὺς, καὶ οὐδένα ἄκοντα, ἀλλὰ πάντας μᾶλλον ἔτι ἐμοῦ σοι βουλευμένους φίλους εἶναι. καὶ νῦν πάρεισιν οὐδέν σε προσαιτοῦντες, ἀλλὰ καὶ προΐεμενοι καὶ πονεῖν ὑπὲρ σοῦ καὶ προκινδυνεύειν ἐθέλοντες· μεθ’ ὧν, ἂν οἱ θεοὶ θέλωσι, πολλὴν χώραν τὴν μὲν ἀπολήψει πατρώων οἶσαν, τὴν δὲ κτήσῃ, πολλοὺς δὲ ἵππους, πολλοὺς δὲ ἄνδρας· καὶ γυναῖκας κατακτήσει, οὓς οὐ λήξεσθαί σε δεήσει, ἀλλ’ αὐτοὶ φέροντες παρέσονται πρὸς σέ· δῶρα.*

## 5. Translate into Greek—

- (1.) If I had had money I would have given it to him.
- (2.) He says that he himself is general, but that we are private persons.
- (3.) I know what will happen if this man comes.
- (4.) May the gods grant me virtue and faithful friends!
- (5.) We ourselves have often done the same things.

## CLASS D.—LATIN (Optional).

1. Give the dative singular of *unus, idem, alter, respublica*.  
Give the first person singular of the perfect indicative active, the present infinitive active, and the supine in *um*, of each of the following verbs :—*Scindo, quæro, pasco, sepelio, gigno, cogo, adolesco*.  
Give the first person future indicative of *pereo, memini, prosum*.
2. What are the so-called supines, and how are they used? Is the supine in *u* dative or ablative? Give reasons.  
Express in Latin in two ways, using (1) the supine, (2) the gerundive, Ambassadors came to sue for peace.
3. Explain the use of *ut* and *ne* after verbs of fearing.  
How is *quin* used (1) in independent, (2) in dependent sentences?
4. Explain the use of the cases in the words printed in italics in the following sentences :—*Permulta nobis facienda sunt. Exitio est avidis mare nautis. Atrox discordia fuit domi forisque. Est mihi tanti Quirites hanc invidiam subire. Paucis post diebus fit certior.*  
In the last sentence what part of speech is *post*?
5. Translate :—*Et manu fortis et belli peritus fuit, et, id quod in tyranno non facile reperitur, non luxuriosus, non avarus, nullius denique rei cupidus nisi singularis perpetuæ imperii, ob eamque rem crudelis: nam, dum id studuit munire, nullius pepercit vitæ, quem ejus insidiatorem putaret. Hic cum virtute tyrannidem sibi peperisset, magna retinuit felicitate: major enim annos sexaginta natus decessit florente regno. Neque in tam multis annis cujusquam ex sua stirpe funus vidit, cum ex tribus uxoribus liberos procreasset multique ei nati essent nepotes.*
6. Translate into Latin :—  
Socrates used to inquire what things were just, what unjust.  
Dionysius, having been expelled from Syracuse, opened a school at Corinth.  
Cæsar, having overcome the Gauls, waged war with Pompey.  
He could easily have done this, and he ought to have done it.

## CLASS D.—ALGEBRA (Optional).

1. Explain fully the meaning of the expression—  
$$[a + \sqrt{2b^2 + c^2}]^2 - [(b+c)^2 - a^2],$$
  
and calculate its value when  $a=5, b=4, c=7$ .  
If  $x=5\frac{1}{2}$ , find the value of  $\left(x + \frac{2x}{x-3}\right) \div \left(x - \frac{2x}{x+3}\right)$ .
2. Find the continued product of  $px+qy, qx-py, p^2x^2-pqxy+q^2y^2$ , and  $q^2x^2-pqxy+p^2y^2$ .  
Arrange your answer in ascending powers of  $y$ , collecting co-efficients of like powers in a bracket.
3. Simplify  $x-2y - (-3z + [(2x-y+2) - (3x-22)] - x)$ .  
$$\frac{1}{4}(3x-2y) - \left\{ -\frac{3x-2y}{5} - \frac{1}{2} \left[ \frac{4x-3y}{5} - (3x-\frac{y}{2}) \right] \right\}.$$
4. Resolve into elementary factors  $x^3-8y^3; 12x^2-2xy-2y^2; (5a-7b-c)^2 - (4a-2b+c)^2;$   
 $a^2+b^2-c^2-2ab; 2(uv+xy)+u^2+v^2-x^2-y^2.$
5. Find the highest common divisor and the lowest common multiple of  $36a^6-18a^5-27a^4+9a^3;$   
 $27a^5b^2-18a^4b^2-9a^3b^2.$
6. Find the value of  $\frac{x+y-1}{x-y+1}$ , when  $x=\frac{a+1}{ab+1}, y=\frac{a(b+1)}{ab+1};$   
and simplify  $\frac{6x}{3x-2} - \frac{30x^2+4x}{9x^2+4} + \frac{4x}{3x+2}.$
7. Solve the equations—  
$$\frac{2x+1}{29} - \frac{402-3x}{12} = 9 - \frac{471-6x}{2}.$$
  
$$\frac{c-x}{a+b} + \frac{a-x}{b+c} + \frac{b-x}{c+a} = 1.$$
8. A steamer can travel  $x$  miles an hour with engines alone in calm weather, and her speed is increased by  $y$  miles an hour when she uses her sails with a favourable wind, and diminished by  $y'$  miles an hour when the wind is contrary. If she have a current flowing at the rate of  $z$  miles an hour, ( $\alpha$ ) in her favour, ( $\beta$ ) against her, how fast can she travel in each case, supposing (1) that the wind is favourable, and (2) that it is contrary?
9. The areas of two adjacent countries are as  $a$  to  $b$ ; in a war between them the latter takes from the former  $p$  square miles of territory, and then their areas are in the ratio of  $m$  to  $n$ : find the area of both countries at first.

## CLASS D.—EUCLID (Optional).

1. Define a plane surface, a plane angle, and a circle. Is Euclid's use of the word "circle," for example in the First Proposition of the First Book, in accordance with the definition? Quote the axioms which are exclusively geometrical.
2. From a given point to draw a straight line equal to a given straight line.  
In the construction of the figure, the sides of the equilateral triangle may be produced, not beyond the base, but through the vertex. Construct the diagram in this manner, and show how the proof must be modified.
3. If two triangles have two sides of the one equal to two sides of the other, each to each, but the angles contained by those sides unequal, the base of that which has the greater angle shall be greater than the base of the other.

4. The opposite sides and angles of a parallelogram are equal to one another, and the diagonal bisects it.

Show that, if the diagonals of a parallelogram are equal, the figure is a rectangle; if the diagonals are perpendicular to one another, the figure is a rhombus; and if they are both equal and perpendicular to one another, the figure is a square.

5. In any right-angled triangle, the square which is described on the side subtending the right angle is equal to the squares described on the sides which contain the right angle.

6. If a straight line be bisected and produced to any point, the rectangle contained by the whole line thus produced and the part of it produced, together with the square of half the line bisected, is equal to the square of the straight line which is made up of the half and the part produced.

7. To describe a square that shall be equal to a given rectilineal figure.

Show how to divide a straight line into two segments such that their rectangle may be equal to a given square.

#### CLASS D.—CHEMISTRY (Optional).

1. What is the effect of heat on the following compounds:—Nitrate of ammonium, red oxide of mercury, black oxide of manganese, chlorate of potash?

2. How much oxygen can be got from 100 grammes of mercuric oxide? ( $\text{Hg}=200$ .)

3. 10 grammes of ammonia ( $\text{NH}_3$ ) are dissolved in water. How much pure nitric acid ( $\text{HNO}_3$ ) is required to neutralize the solution?

4. In what different ways could you cause an explosion of a mixture of hydrogen and chlorine in a clear glass vessel?

5. How much carbon dioxide (carbonic acid) can be produced by the combustion of 1 ton of coal containing 70 per cent. of carbon?

6. Arrange the following gases in the order of their specific gravity:— $\text{CO}_2$ ,  $\text{CO}$ ,  $\text{SO}_2$ ,  $\text{H}$ ,  $\text{O}$ ,  $\text{Cl}$ ,  $\text{N}_2\text{O}$ ,  $\text{CH}_4$ ,  $\text{H}_2\text{S}$ ,  $\text{NH}_3$ .

7. What is the "firedamp" of coal-miners? What becomes of it in a colliery explosion?

8. Describe fully (using equations) how the following bodies are made:—Chlorine, nitric acid, ammonia, sulphuretted hydrogen, hydrogen.

9. State what you know of the composition of the atmosphere.

10. State clearly the points of difference between red phosphorus and yellow phosphorus; and explain how the one can be converted into the other.

#### CLASS D.—ELECTRICITY (Optional).

1. Describe an electrophorus, and state the use of the tinfoil that is generally placed under the sole.

2. How would you make experiments to show the distribution of a charge of electricity on a sphere, a dish, and a cube respectively?

3. Describe exactly how to make the experiment to prove that the charge of a Leyden jar is chiefly confined to the glass jar rather than to the covers.

4. Describe experiments to show that different dielectrics possess each a "specific inductive capacity" of its own.

5. Describe a one-fluid and a two-fluid galvanic cell, and state the advantages of using the latter.

6. How may experiments illustrating the phenomena of magnetism be made by a wire bearing an electric current, without the aid of any magnetic metal?

7. Describe Siemens's or Becquerel's electric pyrometer.

8. Describe and explain Bell's telephone.

9. Make a sketch illustrating the principle of some form of apparatus for reversing a current of electricity.

10. Draw a section through a submarine telegraph cable, and describe any form of recording instrument used with such cable.

#### CLASS D.—SOUND AND LIGHT (Optional).

1. What are respectively the effects of heat, of pressure, and of the presence of water vapour, upon the velocity of sound in air?

2. Describe all the essentially different ways in which sound may be made to interfere.

3. What are the laws of the vibration of strings? State all the circumstances that influence the character of the tone of a stringed instrument.

4. In what several ways has the velocity of light been determined? Describe one celestial and one terrestrial method in detail.

5. Draw diagrams illustrating a total eclipse of the sun and a partial eclipse of the moon. What is the difference in the shadow cast by an object when a disk and a point of light are respectively used to produce it?

6. The reflection of a lamp in water is generally a long wavy line of light; draw a diagram to explain this phenomenon.

7. Explain total reflection, and describe experiments to illustrate it.

8. Describe the eye, and state the functions of its several parts. How is the achromacy of the eye usually explained?

9. Show by a diagram how an opera-glass makes an object appear nearer.

10. Describe two different ways of polarizing light. How may polarized light be distinguished from common light?

## CLASS D.—HEAT (Optional).

1. How is a thermometer made and graduated? Name six different modes of estimating temperature.
2. Describe experiments illustrating the expansion of solids, liquids, and gases.
3. How does heat diffuse itself?
4. Describe four ways in which clouds are formed.
5. What are the laws of ebullition? How would you make experiments to illustrate these laws?
6. How is specific heat determined? What are the laws of specific heat?
7. Describe as fully as you can all the phenomena that would ensue if water at the temperature of  $-20^{\circ}\text{C}$ . were gradually heated until it dissociated into its elements.
8. A cannon-ball weighing 100lb. has a velocity of 1,000 feet a second: express the energy in heat-units.
9. In what several ways may radiant heat be disposed of when it falls upon a surface?
10. Classify the different kinds of energy, and give a general account of all the energy available to the earth.

## CLASS D.—BOTANY (Optional).

1. What are leaf-buds? where do they occur? of what parts are they formed? and what is their use?
2. What are stomata? where are they found? and what is their function or use?
3. What is the difference between seed and fruit? Describe all the different parts of a hazel-nut, and state the parts they each formed in the flower.
4. Describe the differences between a mulberry and a raspberry, and explain the use of the fruit to a plant.
5. Describe, in as much detail as you can, the flower of the following plants:—Bean, wheat, geranium, hyacinth, primrose, dandelion.
6. What is starch? Of what use is it to the plant? In what parts is it found? Name some of the uses of starch to man.
7. Give an account of the movement of water in plants, and of the causes which may in part account for this movement.
8. By what means do plants absorb carbon, hydrogen, oxygen, and nitrogen?
9. Describe some instance of adaptation in a flower for fertilization by insects, and explain the object of this.
10. What are the different effects of insular and continental climates on plants? Explain as fully as you can.

## CLASS D.—GEOLOGY (Optional).

1. Give the distinguishing characters of the following minerals:—Quartz, felspar, mica, hornblende, calcite, olivine.
2. Give an account of the origin (or formation) of slate and sandstone.
3. State your opinion as to the origin of ordinary compact limestone, and give reasons for it.
4. Describe the structure of a volcanic mountain.
5. Distinguish sedimentary (aqueous) from eruptive (igneous) rocks.
6. How do you distinguish contemporaneous from intrusive eruptive rocks?
7. Define what is meant by "a dyke," "a vein," "a concretion."
8. Prove the statement, "The land moves while the sea remains stationary."
9. What is meant by a fossil? How did fossils get into rocks?
10. How are lakes formed?

## CLASS D.—FRENCH (Optional).

1. Give the feminine of the following words: *Inspecteur, jardinier, gardien, marquis, époux, chasseur, défendeur, radoteur, chanteur, majeur*.
2. Give the following collectives in French: A dozen, a score, a collection of fifty, a collection of one hundred, a collection of one thousand.
3. What are the two genitives of *qui*, and how do they differ in their use?
4. Give the pres. ind. of *se nuire* in full.
5. Give the first pers. sing. of the pres. ind. of—*Bouillir, vêtir, acquérir, cueillir, battre, conduire, naître, vaincre, rompre, mourir*.
6. Translate into English—*Bref, brièvement, du reste, de reste, toutefois, toutes les fois, de bonne heure, à la bonne heure, à midi, au midi de, de service, en service*.
7. What are the peculiarities of pronunciation in—*Faon* (a fawn), *œuf frais* (new-laid egg), *des os* (bones), *Jésus Christ*, *Bruxelles* (Brussels), *Août* (August), *faisant* (doing), *oignon* (onion), *lis* (a lily), *second* (second)?
8. Has *plusieurs* a singular, and has it a separate form for the feminine?
9. When are *on* and *quiconque* feminine?
10. Give the French for the following conjunctive locutions: Considering that, as well as, as soon as, rather than, as long as.
11. Translate into French—I am right; I am wrong; I am afraid; I am ashamed; I am in need of.
12. Translate into French (speaking of the weather)—It is fine; it is bad weather; it is hot; it is foggy; it is windy.

13. What are the rules for the agreement of adjectives with *gens*?
14. Translate into French—I, who speak to you; he and I will go there; they alone escaped; you (sing.), he, and I will be punished; he will go to England; I will remain here.
15. Give the leading rules for the use of the subjunctive.
16. In what cases is the def. article used in French, but not in English?
17. Mention some of the most common neuter verbs requiring the auxiliary *être*.
18. Give the impersonal verb *dégeler* in full.
19. Of what gender are abstract nouns ending in *eur*, and what are the exceptions?
20. In asking questions, when must *qu'est-ce que* be used with the verb, and what are the exceptions?

21. Translate into English,—

(a.) Jean revint à lui dans son propre lit. Il lui sembla secouer un cauchemar, mais une douleur horrible qui le cloua sur son oreiller aussitôt qu'il essaya de se mouvoir l'avertit que ce prétendu cauchemar était une réalité. Ses yeux voilés d'ombre se portèrent lentement vers la fenêtre en face de lui, et il entrevit, dans les vagues lueurs de l'aube, un soldat qui se promenait dehors en faction, l'arme au bras. Sa maison était gardée; à la prière de M. le doyen, qui répondait de sa personne, les autorités allemandes la lui avaient assignée pour prison jusqu'au moment où il serait en mesure de répondre à la justice.

Cette affaire avait fait grand bruit; le bourg tout entier craignit un instant d'être puni. Le général prussien s'était montré moins touché du meurtre d'un de ses soldats qu'indigné du scandale qui en avait été la cause première, et il semblait certain que Jean aurait à payer cher l'un et l'autre méfait, à moins qu'un maître plus puissant que tous les vainqueurs et tous les conquérans du monde ne le délivrât auparavant, ce qui d'ailleurs était probable. Le chirurgien n'avait laissé que peu d'espoir.

La première parole de Jean lorsqu'il reprit connaissance fut :—Désirée !—D'un signe il appela le père Hannequin, assis à l'écart, sa tête grise affaissée sur sa poitrine :—Allez, ...murmura-t-il, allez la chercher.

Il ne manquait pas là de gens pour le veiller. La chambre était encombrée de monde, malgré les recommandations du médecin. Hannequin obéit donc sans répondre. En son absence, M. de doyen se présenta; il vint apporter à celui qu'il avait reçu au baptême dès le premier jour de sa vie les consolations de la dernière heure :—C'est donc fini? dit Jean d'une voix faible.

—Désires-tu vivre? répliqua le doyen avec un accent qui voulait dire :—Personne ici ne souhaite que tu te relèves de ce lit, car ce serait pour marcher à l'expiation.—Et Jean parut comprendre.

—Je ne veux pas mourir avant de l'avoir revue, répliqua-t-il pourtant. Qu'elle se dépêche...

(b.) Rome, qui en littérature a presque tout emprunté aux Grecs, ne leur est pas redevable de l'oraison funèbre. Ce sont les Romains qui ont imaginé ce genre d'éloquence, et sur ce point ils ont devancé les Athéniens eux-mêmes. Cela est affirmé par Denys d'Halicarnasse et par Plutarque, et le témoignage de ces deux écrivains grecs mérite d'autant plus de crédit qu'il est plus désintéressé. Denys assure que la première harangue funèbre fut prononcée à Rome seize ans avant que les Athéniens se fussent avisés de célébrer ainsi les morts de Marathon. Cette première harangue romaine fut celle que fit Valérius Publicola en l'honneur de son collègue Brutus, qui avait chassé les Tarquins. Pour être né sur le sol national, l'éloge funèbre à Rome eut des caractères particuliers qu'il n'eut pas en Grèce. Chez les Romains il était consacré à un homme; chez les Grecs il était collectif, accordé seulement aux guerriers tombés ensemble dans une bataille ou dans une même campagne. Ainsi furent honorés par Périclès les soldats morts dans la guerre du Péloponèse et par Démosthène ceux de Chéronée. De là, selon Denys, un autre caractère distinctif : en Grèce, on ne célébrait que le courage, puisqu'il ne s'agissait que de héros militaires; à Rome, on vantait encore les vertus civiles.

#### CLASS D.—GERMAN (Optional).

1. Translate into German—Ten feet long; two pounds of coffee; a dozen pocket-handkerchiefs; six inches wide; ten degrees of cold.
2. What is the gender of metals in German? What exceptions are there to the general rule?
3. Translate—The rivers of England; the Kingdom of Holland; Parisian gloves; she is a Russian; the month of June.
4. Translate—All the girls; all your money; both the brothers; both my sisters; many a flower.
5. Decline—*Armer Mann; die gute Dame; ein schönes Kind*.
6. What peculiarity have the following adjectives in their comparative and superlative: *Blass, bunt, falsch, froh, hohl, &c.*?
7. Translate—This apple is more sweet than large. This apple is sweeter than that one. He is as tall as you. She is as old again as her brother. The more you work the more progress you will make.
8. Translate—Once, twice, thrice, of one kind, of two kinds, of three kinds, simple, twofold, threefold, a half, a third, a fourth, first, secondly, thirdly.
9. Decline *ich, du, er, sie* (she), *sie* (they).
10. Decline *mein* and *der meine*. In what two ways can "mine" be expressed in German?
11. Give the first person singular imperfect of *beissen, besitzen, brennen, fechten, graben, halten, kneifen, fangen, kriechen, wachsen*.
12. What particles (prepositions) of compound verbs are separable or inseparable, according to the meaning of the verb?
13. Give the transitive verbs corresponding to the following neuter verbs: *Ertrinken, fallen, lauten, sinken, trinken*.

14. Give the present indicative in full of *sich befinden*.
15. Give the following numbers in German: 20, 30, 40, 50, 60, 70, 80, 90, 100, 1,000.
16. Give the first ten ordinals in German.
17. Translate the following adverbial expressions: At present, just now, everywhere, backwards, outside, downwards, henceforth, not long ago, for the last time, twice a day.
18. Translate the following adverbial conjunctions: Accordingly, meanwhile, besides, on the contrary, scarcely, rather, nevertheless, as for the rest, however, likewise.
19. Give the following expressions each in *one* compound word: Heavy as lead; cold as ice; round as a ball; big as a giant; smooth as a mirror.
20. Translate impersonally—I am cold. I am giddy. I feel sleepy. I am disgusted. I am hungry.
21. Translate into English:—

(a.) Das gelbe Laub erzittert  
 Es fallen die Blätter herab,—  
 Ach, Alles, was hold und lieblich,  
 Verwelkt und sinkt in's Grab.  
 Die Wipfel des Waldes umflimmert  
 Ein schmerzlicher Sonnenschein;  
 Das mögen die letzten Küsse  
 Des scheidenden Sommers sein.  
 Mir ist, als müsst' ich weinen  
 Aus tiefstem Herzensgrund;  
 Dies Bild erinnert mich wieder  
 An unsere Abschiedsstund'.  
 Ich musste dich verlassen  
 Und wusste, du stürbest bald!  
 Ich war der scheidende Sommer,  
 Du warst der sterbende Wald.

(b.) Natur nennen wir den Inbegriff oder die Gesamtheit Alles Dessen, was durch die Sinne wahrgenommen werden kann. Wir fühlen Dasjenige, was unsere Haut berührt, wir sehen Alles, was in der Nähe und Ferne dem Auge sich darbietet, wir hören das mannichfache Geräusch um uns her, wir riechen den Duft der Blumen und schmecken das Eigenthümliche der verschiedenen Dinge. Die Sinne sind daher die eigentlichen Vermittler zwischen Geist und Natur. Sie allein geben dem Geiste Nachricht von dem Vorhandensein Desjenigen, welches ausser ihm sich befindet, so dass er nur durch die Sinne zum Bewusstsein einer Aussenwelt gelangen kann.

Es ist unmöglich, dass der Geist sich die Vorstellung irgend eines Theils der Natur bildet, der ihm sinnlich nicht darstellbar ist. Der Blinde z. B. kann zwar durch das Tasten die Form der Dinge zu seinem Bewusstsein bringen, aber er wird nicht die geringste Vorstellung von den verschiedenen Farben haben. Es ist auch nicht möglich, ihm diese durch die Beschreibung zu verleihen. Man kann das Blau, das Roth ebenso wenig beschreiben, als einen Ton oder einen Geschmack.

Wenn daher der Geist in der Erkenntniss der Natur voranschreiten soll, so ist er vor Allem darauf angewiesen, sie durch die Sinne zu betrachten; er muss gleichsam seine Diener aussenden, in das ihm unbekannte Reich und nach deren Berichten seine Vorstellungen bilden. Vergeblich wird selbst der grösste menschliche Geist es versuchen, das Wesen der Natur im Ganzen oder im Einzelnen rein auf dem Wege des Denkens zu begründen und zu erklären. Immerhin wird er auf die sinnliche Wahrnehmung zurückgewiesen werden und die Geschichte zeigt, dass gerade Diejenigen, welche, jenen Führer verachtend, allzu kühn aus dem Geiste allein die Natur erfassen wollten, am weitesten sich verirrtten.

#### CLASS D.—ITALIAN (Optional).

1. Translate into English—*Più chiaro del sole. Cesare è assai più stimato di Pompeo. Ho due bastoni, ve ne dò uno. C'è pane sulla tavola. Questo libro è stato utilissimo al mio fratello.*
2. Give the meaning and the plural of—*Il rè, l'occhio, la mano, lo zio, il cuoco.*
3. Give the augmentatives of *capello, sala, porta*; and the diminutives of *naso, povero, anello.*
4. Translate into Italian—Three, fourteen, fifty, two hundred, six thousand, a score, one-half, two-thirds.
5. State what you know about the formation of the feminine of adjectives. Give examples.
6. Form adverbs from *santo, sano, costante, fedele, povero.*
7. Name in Italian the days and months.
8. Translate into English—*Quanto zucchero ha Ella? Ne ho abbastanza.*
9. Give the present indicative of *venire* and *uscire*.
10. Give the present and past participles of *fare, dire, andare, salire, mettere.*
11. Speaking to a person of his or her father, you either say, *il tuo padre, il vostro padre, or il suo padre.* State the different cases in which you would make use of each of these expressions.
12. How many conjugations of regular verbs are there in Italian? Give one infinitive of each conjugation.
13. Decline the personal pronouns.
14. Give the Italian for—the creation, the earth, the ocean, the sea, the heavens.
15. Give the meaning of *il fiume, la riviera, il paese, la via, lo stivale.*
16. State all you know about the Italian accent.
17. Give a list of demonstrative pronouns.

18. Give the comparative of superiority of *buono, cattivo, grande, piccolo*.

19. Translate into English—

Un predicatore dovendo fare il panegirico di San Luca, subito che fù in pulpito, perdè talmente la memoria che non potè dir altro che il testo del suo discorso: Luca medico, vi saluta. Ripetè tante volte queste parole, senza potersi ricordar d'altra cosa, che gli uditori stanchi, s'alzarono tutti, e nell' andarsene, uno di loro disse al predicatore: Padre mio, salutatelo anche da parte nostra.

20. Translate also—

CONTRO L' INGRATITUDINE.

Benchè di senso privo  
Fin l' arborescello è grato  
A quell' amico rivo,  
Da cui riceve umor :

Per lui di frondi ornato  
Bella mercè li rende ;  
Quando dal sol difende  
Il suo benefattor.

METASTASIO.