1884.

NEW ZEALAND

EDUCATION:

EXAMINATION OF TEACHERS.

[In Continuation of E.-1A, 1883.]

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, 13th June, 1884.

I have the honour to submit a report on the sixth annual examination for teachers' certificates. The examination took place at the end of January, and the names of the successful candidates, and of those who were "partially successful," were published, by your authority, in the *Gazette* of the 24th of April. There were, as usual, fifteen centres, of which three were in the Education District of Auckland, and two in Hawke's Bay

The number of candidates (592 present) was greater, and the general result (as indicated by the number of passes) was more satisfactory, than at any former examination. The improvement is especially noticeable in the lowest class (E) Last year, out of 255 candidates for that class, only 10 passed, while 147 were "partially successful." This year, out of 267, as many as 60 passed, the number of the "partially successful" being 96. The total number added to the list of persons qualified, so far as examination can qualify them, to receive certificates, including those who, being formerly "partially successful," have now completed their examination, is 213. Fuller statistical details are shown 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	31	1	2	10	11		6		31	2	54	6	154
Of whom—Present at examination.	28	1	2	10	10		6		29	1	51	5	143
Passed for Class D	3				1		1		7		11	1	24
Partially successful for Class D	5			3	1				8		7		24
Passed for Class E	1				1				1				3
Partially successful for Class D and completed examination for Class E	2		1	1	1				3		6		14
Completed former examination for Class E	2			1	3				5	1	12	2	26
Entered for Class E	78	1	8	23	14	1	5	16	52	11	70	18	297
Of whom—Present at examination	68	1	8	21	14		4	16	46	10	62	17	267
Passed for Class E	11	1	1	3	5		2	3	15	3	16		60
Partially successful	21		1	9	7		2	4	11	5	28	8	96
Entered to complete former examination	54	4	4	9	16	2	5	5	51	5	45	9	209
Of whom—Present	50	4	4	8	12	2	5	5	45	4	36	7	182
Successful	20	1	4	4	6	2	2	2	22	3	16	4	86

Total number of candidates who entered, 660.
Total number present, 592.
Total number of candidates who improved their position, 333, or 56·241 of the number present.

1—E 1A.

The examiners were the same as those of last year, with two exceptions the Rev W H. West, B.A., LL.B , examined in English for Class E, instead of Neil Heath, Esq , who was unable to undertake the work this year , and the examination in school management and the art of teaching was conducted by F J Gladman, Esq , Principal of the Training Institution in Melbourne, instead of by Principals of normal schools in this colony The greater part of Mr Gladman's report is herewith submitted for publication. I attach also a file of this year's examination papers, omitting only those set in drawing and music

The amount of money received as fees from candidates this year is £452 , the cost of the examination being £439 12s 8d.

A considerable number of teachers have been successful in passing examinations at the University during the year, and have by this means obtained certificates of the higher classes.   I have, &c ,

WM. JAS. HABENS,

The Hon. the Minister of Education.   Inspector-General of Schools.

EXTRACT from Mr GLADMAN's REPORT on the EXAMINATION in SCHOOL MANAGEMENT.

IN *Section I*,* several teachers presented the time-tables they use in their schools. In whole sets of papers, also, the same form of time-table appears. A question of this character seems to have been anticipated and prepared for On the other hand, some candidates are evidently unpractised in drawing up time-tables , their schemes are rambling the sequence of subjects is ill-considered , some subjects are not provided for , the supervision and actual mode of working are not indicated, and there is no summary showing the time given to each subject during the week. Candidates should aim at compactness and completeness the time-table asked for did not need to occupy more than half a page, the supervision could be indicated by reference letters or by under-lining, and all the necessary references and explanations could come below

Some who attempted the second question have made creditable answers others have not adhered to the arrangement indicated in the question. Many have wrong ideas about principles, and have made strange replies in consequence.

Section II.—A large number of answers to the first question are needlessly diffuse candidates have spent so much time over it as to leave too little for later questions. The uses of registers to the teacher are generally overlooked the meaning of " average " is not understood " days " are taken instead of " times;" " not less than" is interpreted as " more than," and many egregious blunders are made on this simple and every-day matter

The alternative question is usually done better

Section III.—The notes of a lesson are often more like essays than what lesson-notes should be , some candidates have aimed at showing how much they know of their subject, rather than at showing how they would teach it. Too little attention is paid to arrangement for teaching purposes, and method is not indicated with sufficient clearness. Even where separate columns are drawn for matter and method, both are often jumbled together in a fashion which shows want of clear-headedness, and an inadequate or wrong idea of the purpose and use of the columns. Some have been wise enough to show a fair half-hour's work, and have then indicated the lines of treatment they would adopt in future lessons , others do not seem to have regarded the matter from the practical side, and have made their notes far too long, or else too meagre. Frequently there is an assumption that children know all about the subject, and such directions as these appear—" Get the children to name," " Have the battles named," " Obtain who won,"—before the information has been given. " Elicit this," is not infrequent where eliciting would be out of place, if not impracticable. How to " elicit " is seldom shown some say they will " elicit by many skilfully-framed questions," but they give no specimens, and no indication in detail of what they mean. Such evasions of the most difficult points create an unfavourable impression in an examiner's mind. Absurd inaccuracies, which I forbear to particularize, are found in places. Some attempts at illustration are creditable, others very feeble.

I would earnestly recommend young teachers to practise drawing up lesson-notes they need not follow any one plan, but they should always show every detail clearly, and should indicate how they propose to deal with every point in turn.

In *Section IV* most candidates have attempted Question 2 it has appeared in much the same form at other examinations, and seems to have attracted notice, for several answers are very creditable. Almost all say that definitions should come after examples it is strange, therefore, that in Section III. some of these very candidates should begin their lesson-notes with a definition , their theory and practice do not agree.

The question on reading has not been handled well. The phrase " violations of sound principle " is ill-understood. Children's mistakes are given, instead of teachers' faults, which were asked for Detail is seldom mentioned, but only the broadest indications of method are given , and, generally, there is far too low an ideal of what a reading-lesson should be.

Only a few have attempted the question on cross-multiplication, and no one has shown much power in dealing with it the device of using a diagram to demonstrate or get the children to see the reason for the rule is not employed at all.

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* *Vide* the paper on School Management, at page 7

Section V.—This important section deals with principles. Beneke's maxim has been regarded too exclusively from the disciplinarian's stand-point. The pre-eminence of the eye as an inlet to the mind, and the consequent desirability of making teaching objective, has rarely been touched. Such illustrations as have been given, with one or two noteworthy exceptions, correspond to the limited view candidates have taken.

Payne's statement has been touched by comparatively few, and in no case has the essential point—mental activity and striving, on the learner's part—been adequately brought out.

The third rule, "Proceed from the known to the unknown," has been taken up by the majority, the answers also are generally correct in outline, but are too often paltry and meagre.

Section VI.—Defective and illogical definitions abound in the answers to the first question. Comparatively few have tried Question 2, and these with only indifferent success. Question 3 has elicited a few respectable answers, but more which are wordy and diffuse.

In *Section VII* the question on organization has seldom been well done, more, in some cases, from limited time, and from want of power to marshal the thoughts, than from absolute lack of knowledge. Only five or six have made respectable answers to the question on telling and eliciting, and still fewer give satisfactory evidence of power to grapple with the question on mental science, although several have indulged in inflated writing upon it, sometimes, it is to be feared, with a view of stealing a few marks by the manœuvre.

Many candidates have suffered through not mapping out their time judiciously To answer a couple of easy questions at so great length as to leave only time enough for half-a-dozen lines for each of the remaining four or five, is bad economy Those who have obtained the highest marks have usually made fair answers in all the sections, rather than lengthy or elaborate answers in three or four sections only they also adhere to the directions.

Some answers are needlessly long, and frequently wide of the mark. No value can be given for an answer, unless it bears on the question actually set some candidates have, in effect, written answers to questions of their own making. A minute or two spent in finding out exactly what the question means, and then arranging the plan for answering it, favours conciseness and completeness, and almost invariably adds to the marks. Diffuse, pointless writing, in which little or nothing is said, is valueless, an examiner may give no marks at all for whole pages of such work.

The tendency to use stock phrases, and to drag in expressions from text-books, is very marked. These are sometimes introduced in such a connection as to show that the candidate does not know what he is writing about. Whole paragraphs have evidently been learned off by heart, and have been incorporated into answers with but little relevancy Questions demanding independent thought and constructiveness are poorly answered. Teachers should try to get down to fundamental principles, rather than attempt to get up school management from a text-book by learning off strings of details, as they would from a skeleton history

Not a few have presented themselves whose idea about the examination was far too low, and who had no chance of passing some papers, indeed, are so poor that one may well doubt whether the writers have chosen their proper vocation.

LIST OF PASSES, ETC.

[Extract from *New Zealand Gazette*, 24th April, 1884.]

THE following lists contain statements of the principal results of the examination held at the end of January, 1884. It must be understood that the granting of a certificate depends only in part upon the result of an examination, and that candidates who have not had the experience required by the regulations, or who do not receive the necessary marks from a School Inspector, have no claim to a certificate.

The first list contains the names of the successful candidates at the examination for Class D. The second supplies similar information with regard to Class E The third and fourth lists give the names of candidates who will be allowed to qualify for Classes D and E, respectively by passing at the next examination in those subjects only in which they have this year been unsuccessful. The fifth is the list of candidates who were partially successful in former years, and have now passed in the additional subjects necessary for a certificate.

Every candidate will receive a private intimation of his success or failure, and those whose names are in the third and fourth lists will be advised as to the subjects in which they will require to be examined again.

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—
Frost, Constance H.
*Lippiatt, George.
Murray, James B.
Wellington—
Rutter, Elizabeth M.
Nelson—
Ladley, Harry
North Canterbury—
*Chisnall, Katherine E.
*Fawcett, Lucy
*Foster, William H.
Grant, Henry A.
*Mills, Mahala C.
*Owen, Sydney C.
*Pitcaithley, George.
Otago—
Alves, Margaret W

Otago—*continued.*
*Campbell, Andrew.
*Gillies, Mary
*Line, Leonard A.
*McIntyre, Hugh.
*MacLymont, Victor H.
*Methven, James.
Reid, Mary
Simmers, George A.
*Spencer, William E.
Warburton, James.
Southland—
*Smyth, John.

II. PASSED THE EXAMINATION FOR CLASS E.
Auckland—
Astley Hannah.
*Blades, Ellen.
*Christie, James.

Auckland—*continued*
    Dewar, Andelia S.
    Escott, Harriet E.
    *Fisher, Sarah J
    *McIlhone, Mary J
    *MacIver, Margaret C.
    *Walker, Maria E.
    *Weston, Jessie.
    *Wilson, Janet.
    Young, Patience A.
Taranaki—
    Evans, Albert H.
Hawke's Bay—
    *Alpers, Oscar T.
Wanganui—
    Grant, George.
    *Low, David W
    *Strachan, David C.
    *Thomas, Taliesin.
Wellington—
    *Dowdeswell,·Adelaide A.
    *Fairbrother, Thomas.
    *Harrison, Catherine.
    *Lane, Ada L.
    *Lawson, Mary K.
Nelson—
    *Deck, Alice M.
    Peart, Alfred.
Westland—
    *Andrew, William J.
    Green, Richard E.
    *Wylde, Robert E.
North Canterbury—
    *Ansley, Annie.
    *Baird, John H.
    *Baldwin, Kate.
    *Bayley, Kate E.
    Blake, Alexander C.
    *Clarke, Margaret A.
    *Connal, Isabella.
    *Currie, Susan.
    *D'Authreau, Jane.
    *Dick, Janet.
    *Elmsly, Mary E.
    Kilgour, Elizabeth.
    King, Annie D.
    *McIntyre, Sophia.
    *Malcolm, Jeannie E.
    Partridge, Maude M..
South Canterbury—
    *Dash, Sarah E.
    *Hooper, Eliza.
    *Pearson, Agnes.
Otago—
    *Callender, Mary.
    *Cameron, Isabella.
    *Chalmer, Agnes E.
    Clark, William H.
    *Dagger, John.
    *Gordon, Rebecca.
    *Howarth, Alfred.
    *McDougall, Margaret C.
    *Mills, Maria.
    *Moir, James.
    Morris, Gerald.
    Overton, William R.
    *Richardson, Charles R.
    *Scott, Mary
    *Thompson, Lillie.
    *Thomson, William.

III. Partial Success recorded towards Class D.
Auckland—
    Currie, Annie H.
    *French, James M.
    Hamilton, Thomas D.
    *Macky, Helen B.
    Stevens, Percy E.
    Thompson, Harriett W
    Warren, Francis.
Hawke's Bay—
    Evers, Marie E.
Wanganui—
    Guylee, Joseph.
    Maunder, George H.
    Smith, Frank H.
    Wilton, Sarah A.
Wellington—
    Chatwin, Georgina E.
    *Corbin, Annie M.

North Canterbury—
    *Aikman, May C.
    *Bramley, Arthur.
    *Cooper, Arthur.
    Gates, Thomas Adkisson.
    *Gibson, Mary V
    *Harband, Beatrice M.
    McIntyre, John.
    *Mackay, Jessie.
    Speight, James.
    Stewart, Jessie.
    Webber, Abel.
Otago—
    *Barrett, Richard J
    *Christie, Jessie C.
    Cooke, Jean L.
    *Finlay, Thomas A.
    Fraser, Mary I.
    *Gerkens, Teresa C.
    *Gilles, Fanny.
    Ivens, Edgar de Vils.
    *McLaren, William.
    *Palmer, Arthur E.
    Rix, James A.
    *Stewart, George L.
    Waddell, James N

IV Partial Success recorded towards Class E.
Auckland—
    Boyd, Catherine.
    Coulter, Thomas W
    Davis, Charles B.
    Fellows, Mary A.
    Hopper, Mary E.
    Keesing, Kate.
    *Lamb, Minnie.
    Maclaurin, Catherine C.
    McLeod, Bassaleno I.
    McLeod, Hugh.
    Mellsop, James.
    Mulvany, Norah M.
    *Murray, Henry Lamont.
    Murray, William T
    *Paterson, Jessie W
    Ridings, Kate.
    Short, Arthur.
    *Smith, Isabella.
    Smith, Margaret A.
    *Thompson, Georgina A.
    *Watkin, Beatrice E.
Hawke's Bay—
    Alexander, Marie.
Wanganui—
    *Blair, Isabella.
    *Dillon, Maria H.
    *Goodisson, Mary
    Honoré, Jacob.
    McDonald, Agnes L.
    *Macdonald, James.
    Matheson, Alexander.
    Parkes, Frank B.
    *Parkinson, Henry A.
Wellington—
    *Archer, Emma.
    Browne, Emily M.
    Browne, Jane R.
    Elkin, Sarah.
    *Myers, Phœbe.
    *Reeves, Mary E.
    *Watson, Tellira.
Nelson—
    Moore, John.
    Peart, Frederick B.
Westland—
    *Gilroy, Katie G.
    *Kemple, Frances M.
    Payne, Olivia E. G.
    *Scott, Edward A.
North Canterbury—
    *Callender, Helen.
    *Craddock, Annie M.
    *Duncan, Mary.
    *Durey, Fanny.
    *Ick, Mary F
    *McGregor, John W
    McHarg, Elizabeth A.
    Phillips, Leonora M.
    *Robinson, Sarah L.
    *Shepheard, Ellen M.
    Woodford, Kate S.

South Canterbury—
*Bennet, Isabella W
*Brown, Bertha.
Pearson, Mia O.
*Rowley, Jane G.
*Strong, Helen C.
Otago—
*Allan, Orlanno L.
Beattie, John.
*Bott, Amelia.
*Donald, Margaret F
Forbes, Frank J
Fraser, Windsor G.
*Hay, Mary J
*Hilgendorf, Francis.
Huie, Robert.
*Johnstone, Cecilia.
*McDonald, Margaret.
McDonald, William.
McDuff, Alexander.
McLauchlan, David L.
*McLauchlan, Joseph.
*McNaught, Thomas.
*McQueen, Margaret.
*Moss, Sarah.
Nicol, Alexander M.
*Nimmo, Eliza J
*Park, Isabella G.
Robertson, John A.
*Ross, Annie M.
*Scott, Michael H.
Shepard, Henry
*Tennant, John S.
*Wilson, John.
*Winchester, Alice.
Southland—
Andrews, John S.
*Joyce, James F
*Joyce, Lucy J
Kelly, John.
*McNeil, Duncan.
Sebo, William H.
*Stewart, Robert.
*Todd, Helen T.

V PASSED IN THE SUBJECTS REQUIRED TO COMPLETE
FORMER EXAMINATION.
Auckland—
Anderson, Alexander.
Anderson, Barbara C.
Bell, May E.
Burton, Ella.
De Carteret, Lydia A.
Edmiston, Jessie H.
Gibbs, Elizabeth.
Gillies, John H.
Hames, Luther.
Henry, Margaret.
Horne, Arthur.
Marsh, Sarah M.
Mulgan, Maria Thomasina.
Murrish, Mary
Nicholson, Florence.
Poland, John J
Simpson, Helen.
Spence, Jane C.
Stevens, Percy E.
Sullivan, Walter.
Talbot, Richard T
Thompson, Harriett W
Wallis, Emily A.
Waygood, James E.
Taranaki—
Evans, Edward.
Hawke's Bay—
Evers, Marie E.
*Frame, Annie F
Reid, Florence M.
Rosie, Wilhelmina J
Ward, Jenny G.
Wanganui—
Dowling, Richard E.
Hoey Mary N
Maunder, George H.
Nelson, John M.
Patterson, Sarah F
*Williams, Kate.
Wellington—
Bennett, Ann.
Brann, John H.
*Corbin, Annie M.
Hansen, Hester.
Kay, John.

Wellington—*continued*
McGlashan, Jessie.
McKenzie, Christina.
Matthews, James N
Morgan, Margaret.
Schofield, Marion.
Marlborough—
Bary, Charles.
Ogilvie, Charles A.
Nelson—
Edridge, Edward.
Langford, Herbert.
Westland—
Jones, Annie E.
*Roberts, Eliza.
North Canterbury—
Ambrose, Thomas W
Barker, Annie.
Bartrum, Fanny M.
*Bramley, Arthur.
Brock, William.
Bruce, Sarah C.
Cape-Williamson, Henry
*Douds, Martha.
*Ewing, Eliza.
Finney, Annie F
Hamilton, Alfred G.
*Harband, Beatrice M.
Hunnibell, Frederick W
McCormack, Caroline M.
McCormack, Janie D.
*Menzies, Margaret.
Newlyn, John H.
Opie, Charles Henry Adolphus Truscott.
Pole, Richard P
Pole, Thomas L.
Roberts, Jane.
Robinson, William A.
Seager, Henrietta.
Seay, Agnes.
Seay, William N
*Stout, Thomas.
Thomson, Georgiana.
Webber, Abel.
*Wells, Mary
Wright, Elizabeth L.
South Canterbury—
*Cuthbert, Andrew.
Maddison, John.
Marshall, John.
Smith-Ansted, Frederick W
Otago—
*Barrett, Richard J
*Bee, James.
Bishop, Henry
*Bolton, Elizabeth.
Botting, John F
*Cameron, Margaret.
*Campbell, Verona H.
*Colville, Charles H.
Cossgrove, David.
*Crawford, Mary H.
Darton, Henry L.
Dawson, Sarah.
*Farquharson, Elizabeth.
*Finlay, Thomas A.
*Gilles, Fanny.
*Grant, John B.
Grey, Alice M.
Ivens, Edgar de Vils.
*King, Mary
*Kirby, Christiana E.
*Lean, Mary
McLaren, William.
Matheson, Margaret A.
Mill, Janet D.
*Mitchell, Jeanie.
Patrick, John H.
*Robertson, James.
Robertson, Mary A.
Selby, Charles William Glass.
Silk, Anstiss D.
Smith, Charles R.
Waddell, James N
*White, Jeannie.
Wilson, Jane.
Southland—
*Christie, Nellie S.
Fairweather, Jane.
*Fullarton, Catherine J
*Hamilton, Margaret E.
Kelly, Hugh.
Strack, Conrad A.

EXAMINATION PAPERS.

CLASS E.—ENGLISH GRAMMAR AND COMPOSITION

Time allowed   Three hours

1. Define the terms, " noun," " abstract noun," " collective noun ," and give two examples of each.

2. Give the various methods of indicating difference of gender in nouns, and write down two examples of each method.

3. Decline in full the personal pronouns, *I, she, it.* Write three short sentences in which the nominative, possessive, and objective cases of *who*, used as a relative pronoun, respectively occur

4. Mention all the inflections of which verbs admit. Distinguish between the use of *shall* and *will.* Write down three verbs that are used both transitively and intransitively

5. Define a preposition. What are the chief relations expressed by the preposition? Give two examples of words that are used both as adverbs and prepositions.

6. State the force of the prefix in each of the following words, and indicate the language to which each prefix belongs Retract, separate, diameter, foretell, withstand.

How are diminutives formed ? Give three examples.

7 Define a complex sentence, and name all the kinds of subordinate sentences which a complex sentence may include.

8. (1. Analyse and parse—

" That day Llewellyn little loved
The chase of hart or hare."

(2.) Correct the following sentences, and give in each case the reason for your correction (*a.*) He was a poet sublimer than me. (*b.* Let the book lay on the table. (*c.* I wonder who they have asked to the party (*d.*) The bird has forsook its nest. (*e.* I shall never see none of you again.

CLASS E.—EXERCISE IN DICTATION AND SPELLING.

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

9. ' Our happiness as thinking beings must depend on our being content to accept only partial knowledge even in those matters which chiefly concern us. If we insist upon perfect intelligibility and complete declaration on every moral subject, we shall instantly fall into misery of unbelief. Our whole happiness and power of energetic action depend upon our being able to breathe and live in the cloud content to see it opening here and closing there, rejoicing to catch, through the thinnest films of it, glimpses of stable and substantial things , but yet perceiving a nobleness even in the concealment, and rejoicing that the kindly veil is spread where the untempered light might have scorched us or the infinite clearness wearied."—RUSKIN.

10. Spelling exercise Succession, business, crystalline, duteous, mortgagee, auxiliary, emphasize, schooner species, modelled, gnarled, piecemeal, symmetry, reverie.

CLASS E.—ARITHMETIC.

Time allowed   Three hours

1. Reduce a thousand million a hundred thousand and ten square yards to acres.

2. Multiply 15 miles 16 p. 2 ft. by $35\frac{2}{11}$.

3. If £251 7s. 6d. be divided among 8 men and 6 boys, giving each man three times as much as a boy, what is the share of each ?

4. Find, by Practice, the value of 39 oz. 16 dwt. 18 gr at 9s. 10d. per ounce.

5. A bankrupt's assets amount to £3,250, which it is calculated will yield a dividend of 8s. in the pound. Another liability however turns up, which reduces the dividend to 6s. in the pound find the amount of this liability

6. What will it cost to paper the walls of a room 14 ft. 8 in. long, 12 ft. 8 in. broad, and 10 ft. 6 in. high, at $6\frac{3}{4}$d. per square yard ?

7 What is meant by the *least common multiple* and the *greatest common measure* of two numbers ? Explain why their product is the same as the product of the two numbers.

Find the G.C.M. and the L.C.M. of 168, 462, and 616.

8. Simplify $\frac{5}{6}$ of $4\frac{1}{5}$ of $\frac{\frac{3}{4}-\frac{3}{7}}{\frac{5}{6}-\frac{3}{4}}$, and find the value of $\frac{2}{9}$ of a ton $+\frac{3}{7}$ of 3 qr $-\frac{1}{13}$ of 7 cwt.

9. Show how to reduce a terminated decimal to a vulgar fraction.

Divide ·003217 by ·0625, and ·6285 by 14$\dot{8}$.

10. Find the value of ·4321875 of a day and of ·31416 of a pound sterling , and express 4 lb. 1 oz. troy as the decimal of 1 cwt.

11. If standard silver of which 37 parts in 40 are pure silver, be worth 5s. an ounce, find the value of a silver coin containing 3,608 gr of pure silver

12. A squatter engaged 20 shearers, who could have shorn his flock in 24 days but after 8 days' work 4 of the shearers left him how long will the remainder take to finish the work ?

13. What sum will amount to £579 12s. 7d. in 3 years at $7\frac{1}{2}$ per cent. simple interest ?

14. A bookseller lost 20 per cent. by selling a volume at 18s. what must he raise the price to in order to gain 20 per cent. ?

CLASS E.—GEOGRAPHY
Time allowed   Three hours

1 Explain the causes of the seasons.
2. Give in order the names of those seas, &c. which are connected with the Atlantic Ocean.
3. Draw a map of the North Island of New Zealand, mark the names of its capes, and insert ten of its principal towns.
4. Describe the mountain system of Europe.
5. Enumerate the chief countries of Asia, and give the principal towns of each country
6. A steamer goes from London to China, thence to New Zealand, and then returns *via* Cape Horn through what oceans, seas, &c., does she pass?
7 Describe the main physical features of the South Island of New Zealand.
8. What British dependencies are there in or near Europe and Africa?

CLASS E.—ENGLISH HISTORY.
Time allowed   Three hours

1. What oppressive acts of Charles I. were condemned by "The Petition of Right"? Name some of the chief supporters of the King's policy and also some of its leading opponents.
2. Give a short account of Cromwell's foreign policy and its results.
3. Explain the circumstances under which William of Orange became King of England.
4. What advantage did England gain by the Treaty of Utrecht? What war was terminated by that treaty?
5. What was it that led to the " Seven Years' War "? What possessions did England acquire by that war?
6. Give a brief sketch of the origin and growth of England's colonial empire.
7 When and how did the National Debt of England originate? Mention the principal wars that have raised it to its present enormous amount.
8. What was the main object of each of the following enactments The Habeas Corpus Act, the Test Act, the Stamp Act, and the Septennial Act?
9. What political party did George I. favour? Sketch the career of the elder Pitt. For what is he chiefly memorable?
10. How did the French Revolution of 1789 affect English politics?
11. Give the names of three celebrated writers of Queen Anne's reign, and mention some of their works.
12. What important discoveries or inventions are connected with the names of the following Dr. Jenner, William Harvey Sir William Herschel, Captain James Cook, Sir Richard Arkwright?

CLASSES D AND E.—SCHOOL MANAGEMENT.
Time allowed   Three hours.

[N.B.—To obtain full marks, candidates should answer every section. Not more than one question may be attempted in any section. Special attention should be directed to the sections on time-tables, registers, and notes of lessons.]

SECTION I.

1. Construct such a time-table as you would use in an ordinary mixed school of forty children if you were unassisted. Show how you yourself would be actually engaged throughout the day, and indicate in footnotes anything you consider worthy of special notice.
2. Mention the commonest faults found in time-tables, and the chief difficulties in drawing up a good time-table. What general principles will guide you in constructing a time-table for your own school?

SECTION II.

1. State concisely the chief uses of the different school-registers. What is the "strict average attendance," and what the working average attendance "? Say exactly how each is obtained.
2. The "strict average attendance " for three weeks is fifteen there are twenty children on the class-roll. Construct a register in official form, which shall satisfy these conditions, distribute the attendance- and absence-marks as they would be likely to occur in practice and make the usual calculations and entries.

SECTION III.

Draw up full notes of a lesson on *one* of the following subjects, and mention the standard for which your lesson is suited. The lesson is to occupy thirty minutes.
The trade-winds.
A journey to England *via* San Francisco.
Grasses.
Practice (arithmetic
The Wars of the Roses.

SECTION IV

1. Mention some of the most frequent violations of sound principle and good method that are met with in the teaching of reading. How would you deal with the following extract?—
" One of the most mysterious and beautiful of Nature's manifestations is the aurora. In our own latitudes strikingly-beautiful auroral displays may sometimes be witnessed but it is in the arctic and antarctic regions—the true home of the aurora—that the phenomenon appears in its fullest beauty

"Darkness broods over the polar world. Even the outlines of the mighty hills can scarcely be distinguished. No object can be seen moving over the wide expanse of frozen sea.

"Suddenly from east to west appears a beautiful arch of living gold ! The lights dart to and fro, their colours rivalling those of the rainbow Beyond the arch a stream of golden rays shoots up far above all the rest, and the stars are obscured as the 'merrie dancers' sweep along in waves of light."—*Nelson's Royal Readers, No. V*

2. A young teacher gives a first lesson on " the adjective," and proceeds thus He defines the term, writes the definition on the blackboard, and has it repeated three times by the class. Next he tells the children that " great," " good," " large," and all such words are adjectives. Then he directs them to open their reading-books at page 12, and write out all the adjectives in the first ten lines.

Point out carefully any weaknesses in principle and method in this plan of procedure. How would you deal with the subject?

3. A teacher, in giving a lesson on " cross-multiplication," tells his pupils to " write the multiplier under the multiplicand in such a manner that feet shall be under feet, inches under inches, and so on;" next, that " feet multiplied by feet give feet, feet by inches give inches, feet by parts give parts, &c." Then, after showing them how to multiply 7 ft. 9 in. by 3 ft. 6 in., he sets them to multiply 10 ft. 4 in. 5 p. by 7 ft. 8 in. 6 p.

Criticise his statements and his method, and say how you would deal with the subject.

SECTION V

1 " One eye is worth two ears."—(Beneke. Illustrate this maxim briefly by six examples based on your own practice as a teacher

2. " Learning is self-teaching." (Payne.) Explain this statement, and mention a few practical rules which are deducible from it.

3. " Proceed from the known to the unknown." What does this recommendation mean? Say how you would put it into practice in (1) geography and (2) grammar

SECTION VI.

1. Distinguish discipline, punishment, drill, order, obedience, and attention. How are they connected?

2. What hints and advice would you give to a young assistant on " the teacher's eye as a disciplinary agent"?

3. Speaking as a practical teacher and disciplinarian, say in detail, but without diffuseness, how you endeavour to minimise punishment.

SECTION VII.

1. What subjects fall under the head of school-organization? How would you organize a new school of the ordinary type in a country district, and having an attendance of about forty?

2. Institute a comparison between telling and eliciting, as means of instructing and educating children. Arrange your answer in a tabular form, thus :—

Heads.	Telling.	Eliciting.
(1.)		
(2.)		
&c., &c.		

3. State briefly your views as to the advantages that a knowledge of mental science would confer upon a teacher

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CLASSES D AND E.—ELEMENTARY SCIENCE.

Time allowed   Three hours

[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. Describe any kind of apparatus by means of which a man could lift a ton weight.

2. How is the specific gravity of a body determined? If a hollow ball 6 inches in diameter be made of a substance of specific gravity 2, how thick would it require to be so that it would just float?

3. If a ball hung from the ceiling at the end of a string be drawn on one side and let go it continues to oscillate; when it is at the limit of its excursion, if it be struck at right angles it may be made to move in a circle explain the cause of these two kinds of motion.

4. State some of the uses of friction in machinery and in engineering works.

5. What are all the essentially different kinds of energy?

6. What are the laws of the velocity of sound in different substances? How has the velocity of sound in glass been determined?

7 Upon what does the pitch of a musical note depend? If two notes of almost exactly the same pitch be sounded together, what effect does the combination produce?

  8. Explain one method of comparing the intensity of two lights.

  9. How may light be decomposed? How would you show the decomposition to a class?

  10. The inside of an iron roof is often found to be wet in frosty weather explain this.

  11. Describe some of the methods used to produce a freezing-mixture.

  12. Describe the various modes of formation of clouds.

  13. Describe an electro-magnet, and state some of its uses.

  14. How may a magnet be made to produce a current of electricity?

  15. Describe how you would make experiments to illustrate terrestrial magnetism.

  16. Describe the ordinary process of combustion.

  17 State as fully as you can the action of carbonic acid in water.

  18. Describe the skin, and state its functions.

  19. What changes take place in the blood during circulation?

  20. Give a general account of the mode of growth of a tree.

CLASSES D AND E.—DOMESTIC ECONOMY AND LAWS OF HEALTH.
Time allowed   *Three hours.*

[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. How is it that a house or school is generally so much more healthy if placed on a slight rise than if placed in a hollow?

  2. What are the respective advantages of open grates and hot-water pipes?

  3. When is water said to be hard? How may hard water be softened?

  4. What are the chief purposes for which eggs are used in cooking? What are the most suitable methods of cooking them for invalids?

  5. State what you know about the effect of stimulants upon the system.

  6. Children in schools often suffer from shortsightedness what steps should be taken to prevent this?

  7 Why are bad ventilation and draughts injurious? How would you obviate these evils?

  8. Explain the process of digestion. Why is warm cooked food generally better than cold raw food?

  9. Which are the best known disinfectants? What is the especial use of each?

  10. Explain how it is that the temperature of the blood is the same on the hottest day of summer and the coldest day of winter.

CLASS D.—ENGLISH GRAMMAR AND COMPOSITION.
Time allowed   *Three hours.*
[All the *sections* of this paper must be attempted.]

I.
[One question may be omitted in this section.]

  1. State exactly the grammatical functions of the italicized words in the following sentences (*a*) *As* for such *as* turn aside to crooked ways (*b*) *Could* this be undone, I would not have it so, (*c*) A *few* departed (*d*) They are both of a size, (*e*) You have had *enough* worldly *care*; (*f*) Homer is remarkably precise, *which* renders him lively and agreeable, (*g*) I say, knock *me* at this gate, (*h*) Have you *never* a son? (*i*) A noun is the name of a person or thing, *as* James, ship, (*j*) He does not like *paying* his debts, (*k*) *Up* to the stars she turned her face.

  2. Point out any error you notice in each of the following sentences, correct it, and explain why the writer has fallen into it (*a*) Were he still where he was when he wrote to me, I shall, I may tell you, start at once, (*b*) I never was so industrious over any task as this—bending all my energies to it too—and gain so little by my work (*c*) It had been my purpose to have gone thither at once (*d*) You will congratulate him, as you have, according to your critics, on all other occasions, (*e*) Being a great lover of books, the burglar was extremely disappointed in finding nothing but a library in the house, (*f*) It was just the fact of the procession coming into view at this very moment that surprised them most, (*g*) In so familiar, nay, even commonplace a point of view, these deeds, which are in their essence so noble, seem sordid and selfish.

  3. Point out any words that are inaccurately used in the following sentences, substitute the correct word, and distinguish the two words (*a*) The cardinal, after this confession, exonerated the chief conspirator from all his sins, and only inflicted a severe penance, (*b*) He mounted the rostrum and addressed the assembly, and his harangue was so moderate and just that it convinced even his enemies (*c*) The actor was at his very best in this character, and made it a splendid parody of the Premier, (*d*) In this work of fiction the plot and incidents are invented, and the characters, of course, chimerical (*e*) It was a most valuable prize with which he recompensed the children for their industry and attention to his orders, (*f*) He took care to expunge the inscription on all the medals, that there should live no memorial of the deed amongst men, (*g*) He made them a kindly salute in a few well-chosen expressions, and bade them welcome to the country

II.
Break up the following sentence into short sentences, and rewrite it in such a way as to avoid its obscurities, ambiguities, inelegances, and inaccurate or obsolete usages "Hitherto the Parliament had raised their vast sums of money for the support of their army (which could only be

supported by constant great pay), and the discharge of their other immense expenses incident to such a rebellion, from the city of London, and principally from their friends, not daring so rigidly to execute their ordinances generally but contented themselves with some severe judgments upon particular men, whom they had branded with some extraordinary mark of malignancy, out of London, save only that they gleaned among their own zealots upon voluntary collections and plundered by their army, which brought no supply to their common stock, and of what they imposed upon cities and towns in which they had garrisons (in which they had been likewise very tender) they had received very little."

III.

Select any prominent historical personage, and outline an essay on his character *as treated either in some history or in some imaginative work you have read.* Write the introduction and the conclusion in full, but with regard to the body of the essay state briefly in logical order the main ideas you would introduce into it, and under each of the main ideas the subordinate ideas, each of which you would, if you wrote the essay out in full, expand into a paragraph.

IV

1. Spell the words dictated by the Supervisor
2. Write and punctuate the passage dictated by the Supervisor

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CLASS D.—EXERCISE IN DICTATION AND SPELLING.

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

1. Words to spell   Rhubarb, solecism, transcendent, ecstasy, ambergris, aqueous, lachrymal, vis-a-vis, dysentery, conduit, surfeit, intaglio, portmanteau, vignette, mnemonics, asafœtida, rhinoceros, pyrotechnic, hautboy

2. "My lords, I did not intend to have encroached again upon your attention, but I cannot repress my indignation—I feel myself impelled by every duty   My lords, we are called upon as members of this House, as men, as Christian men, to protest against such notions, standing near the throne, polluting the ear of Majesty—'That God and Nature put into our hands!'   I know not what ideas that lord may entertain of God and Nature, but I know that such abominable principles are equally abhorrent to religion and humanity   What! attribute the sacred sanction of God and Nature to the massacres of the Indian scalping-knife — to the cannibal savage torturing, murdering, roasting, and eating   literally, my lords, eating — the mangled victims of his barbarous battles!   Such horrible actions shock every precept of religion, divine or natural, and every generous feeling of humanity   And, my lords, they shock every sentiment of honour, they shock me as a lover of honourable war and a detester of murderous barbarity "

CLASS D.—ARITHMETIC.

Time allowed   Three hours

1. Divide twenty-eight thousand and four million ninety thousand and forty-two by four hundred and ninety-five in factors, and explain the method of obtaining the correct remainder

2. A piece of land contains 2a. 2r. 16p. : how many trees will be required to plant it, allowing a space 5½ feet long and 4 feet broad for each tree ?

3. Multiply 97 miles 7 fur 22 p. 4 yd. 2 ft. 6 in. by $17\frac{5}{7}$.

4. Find, by Practice, the value of 262a. 3r 18p. at £2 11s. 8d. per acre.

5. A rectangular block of stone, having a square base each side of which is 28½ inches, contains 62,137⅛ cubic inches   find its height.

6. Simplify $\dfrac{\frac{1}{2}+\frac{1}{3}+\frac{1}{4}}{\frac{2}{3}+\frac{4}{13}+\frac{5}{21}}$ of $\dfrac{4\frac{5}{8}}{6\frac{1}{6}}$

7 Reduce $\frac{3}{7}$ of $\frac{4}{11}$ of a ton to the fraction of $\frac{5}{22}$ of 4 cwt.

8. Explain the rule for reducing a pure circulating decimal to a vulgar fraction, taking as an illustration the decimal ·$\dot{2}9\dot{7}$

9. Simplify the expression,—

$$(2\cdot\dot{3} \times \cdot\dot{8}5714\dot{2} - 4\cdot4 \times \dot{1}\dot{8}) \times (1 - \dot{1}\dot{6})$$

10. A contractor engaged to make 1,920 yards of railway in 120 days, and for that purpose engaged 160 men, but after 24 days' work he found that he had executed only 240 yards   how many additional men must he engage in order to finish the work in the stipulated time ?

11. It is known that the squares of the periodic times of the planets are proportional to the cubes of their mean distances from the Sun, and that the periodic times of the Earth and Jupiter are respectively 1 year and 11·862 years   hence calculate to three decimal places the mean distance of Jupiter from the Sun, that of the Earth being taken as unity

12. Find the present value of £682 18s. 9¼d., due 3¾ years hence, at 4½ per cent. simple interest.

13. A person makes arrangements to lay by £150 at the end of every year   find how much he will possess at the end of 4 years, reckoning compound interest at 5 per cent.

14. A grocer had 300 lb. of tea, of which he sold 60 lb. at 3s. 7d. per pound, and found that he was gaining only 7½ per cent.   at what price must he sell the remainder so as to gain 10 per cent. on his whole outlay?

15. If mining shares, bought at 25½ per cent. premium, pay 7½ per cent. on the investment, how much per cent. would they pay if bought at 10½ per cent. discount, ½ per cent. in each case being allowed for brokerage?

CLASS D.—GEOGRAPHY

Time allowed   Three hours

1. Explain the connection between the longitude of a place and its local time.   Explain any method by which the longitude of a place may be determined.

If it is 2 p.m. on the 25th January at Greenwich, what is the time at a place whose longitude is 175° E.?

2. Trace the variations of the length of the day at places situated (a) near the equator, (β) in one of the temperate zones, (γ) near one of the poles.

3. Draw a map of England, and insert Helvellyn, River Humber, the Downs, Morecambe Bay, the Solent, Cotswold Hills, Isle of Man, Menai Strait, River Tees, River Severn, Start Point, Snowdon.

4. Write a brief account of the physical features of Africa.

5. What are the political divisions of the Dominion of Canada, and the chief towns of each division?

Mention any other dependency which Great Britain has in America or near its coast.

6. Give as complete an account as you can of the lakes of New Zealand.

7 Draw a map of Asia and of the islands adjacent to its coast.   Mark the principal mountain ranges.

8. Give the principal towns of the following countries, and note anything for which any of them is remarkable   Egypt, Brazil, Afghanistan, Syria, Denmark, Bolivia.

CLASS D.—ENGLISH HISTORY

Time allowed   Three hours

[Candidates may omit five questions.]

1. Describe the fall of the Kingdom of Mercia.

2. Give a full account of the dealings of Ethelred the Unready with the Danes.

3. What were the relations of William the Conqueror to his barons and to his bishops?

4. Give an account of the Council of Clarendon, its objects and results.

5. How did the story of Arthur and the Knights of the Round Table grow up, and what influence had it upon literature and upon history?

6. Discuss the importance of Simon de Montfort's struggles and reforms.

7 How were the liberties of towns secured in England?

8. Had Wyclif's work any political bearing?   Bring out its relations to the risings of the fourteenth and fifteenth centuries.

9. How did the House of Commons come to lose its influence in the reign of Henry the Sixth?

10. Sketch the reign and character of Edward the Sixth and those of Mary

11. Narrate the history of the struggle between the Presbyterians and the Independents during the Civil War and the Commonwealth.

12. How did Sir Robert Walpole succeed in keeping office so long?

13. What victories were won by England and her allies in 1759?   Briefly describe them.

14. Define the importance in English history of any four of the following battles   Halidon Hill, Brunanburgh, Shrewsbury, Bunker's Hill, Sedgemoor, Aboukir, Naseby, Culloden, Bouvines, Northallerton.

CLASS D.—LATIN (Optional)

Time allowed :   Three hours.

1. Parse—*Fieret, velis, requievit, abstulerit, oblitus, venerunt, nactus, esum, itinere, grande, vesperi.*

2. What cases are governed by the following words respectively   *Capax, similis, proprius, egeo, credo, utor, parco, suadeo, memini, impero ?*

What is meant by the expression *Cui bono ?*   Does *cui* agree with *bono ?*

3. How are motion to, motion from, and rest at a place expressed (1) in the case of common nouns, (2) in the case of proper names?

Express in Latin—

He set out from Carthage, and came to Sicily, and on the fifth day he arrived at Rome, and soon afterwards came to see me at my Tusculan villa.

4. What are the ordinary ways of asking a direct question?   Frame instances (1) of simple, (2) of alternative questions.   What is the effect of asking a question without any interrogative pronoun or particle?

5. Express in Latin—

There was nothing to prevent him from coming.

There is no doubt that he will do what he promised.

They returned to the camp some by one road, some by another

Let every man take care of (*consulo*) his own safety

6. Translate—*Ac Romulus, quum septem et triginta regnavisset annos, et haec egregia duo firmamenta rei publicae peperisset, auspicia et senatum, tantum est consecutus, ut, quum subito sole obscurato non comparuisset, deorum in numero collocatus putaretur   quam opinionem nemo unquam mortalis assequi potuit sine eximia virtutis gloria.   Atque hoc eo magis est in Romulo admirandum, quod ceteri, qui dii ex hominibus facti esse dicuntur, minus eruditis hominum saeculis fuerunt, ut fingendi proclivis esset ratio, quum imperiti facile ad credendum impellerentur · Romuli autem aetatem minus his sexcentis annis, jam inveteratis literis atque doctrinis, omnique illo antiquo ex inculta hominum vita errore sublato, fuisse cernimus.*

CLASS D.—ALGEBRA (Optional)

Time allowed   Three hours

1. The sum of the numbers three times a and twice b is divided by the excess of three times a over twice b, and from the result is subtracted the quotient obtained by dividing five times the number a by twice the number b, and the remainder is multiplied by itself. Write down the algebraical expression for the final result.

Explain the meaning of $\left(\dfrac{a}{b^2} - 3\sqrt[2]{\dfrac{b^2}{a}}\right)^2$

2. If $x=5$, $y=4$, $z=3$, find the value of

$$\frac{(x^2-3xy+2y^2)^2 - \sqrt{2x^2 \quad xy + \frac{3y}{2}}}{\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy} - \frac{xy}{z^2} - \frac{yz}{x^2} - \frac{zx}{y^2}}$$

3. Multiply together $px+q$, $p-qx$, and p^2+qx-x^2 Arrange your answer in descending powers of x, collecting coefficients of like powers in a bracket.

4. Divide $10x^4 - 2ax^3 - x^2(5a^2-17b^2) + a(a^2-3b^2)x - b^2(a^2-3b^2)$ by $3b^2 - a^2 + 2x^2$

5. Simplify $[2a-3(b-2a)+c] - (-a+[2a-(3b+c-a)+4b])$,

$$-\frac{a-4b}{3} + \tfrac{1}{2}(2a-b) - \left[\frac{5a-(b-c)}{2} + \left(2a - \frac{2b-c}{3}\right)\right]$$

6. Resolve into elementary factors $x^2-8x+15$ $6x^2-x-12$ $(3a+2b-c)^2-(2a-3b+3c)^2$, x^6-a^6, $81p^4-16q^4$

7. Simplify $\dfrac{2a-3b}{4(a+b)} - \dfrac{a+b}{6(a-b)} + \dfrac{a^2-2b^2}{a^2+b^2}$,

$$\frac{a^3-a^2b}{a^3-b^3} \quad \frac{a^2+b^2}{ab+b^2} \cdot \frac{a^3+b^3}{a^2-ab+b^2}$$

8. Solve the equations

$$\frac{3x-2}{11} - \frac{x-\frac{1}{3}}{5} = 2\left(\frac{6x-43}{7}\right) - 13,$$

$$\frac{a}{ax-a+b} - \frac{b}{bx-b+a} = -\frac{a}{ax+a-b} + \frac{b}{bx+b-a}$$

9. A rectangular field a feet long and b feet wide has a rectangular piece p feet long and q feet wide taken out of one of its corners. What must be the width of a field x feet long which is given in exchange for this field, when three acres of the second kind of land are worth four of the first?

CLASS D.—EUCLID (Optional)

Time allowed   Three hours.

1. Define a parallelogram. What is a parallelogram called when it is right-angled? when it is equilateral? when it is both right-angled and equilateral? In what cases does Euclid in the First Book prove parallelograms to be equal to one another?

2. To draw a straight line at right angles to a given straight line from a given point in the same.

Show how to find a point equally distant from three given points.

3. If two triangles have two angles of the one equal to two angles of the other, each to each, and one side equal to one side—namely, either the sides adjacent to the equal angles or the sides opposite to the equal angles in each—then are the other sides equal, each to each, and also the third angle of the one to the third angle of the other

4. Equal triangles on the same side of bases which are equal and in the same straight line are between the same parallels.

Prove that equal triangles which are between the same parallels are on the same or equal bases.

5. To a given straight line to apply a parallelogram which shall be equal to a given triangle, and have one of its angles equal to a given rectilineal angle.

6. If a straight line be divided into any two parts, the rectangle contained by the whole and one of the parts is equal to the rectangle contained by the two parts together with the square of the aforesaid part.

In a right-angled triangle, if a perpendicular be dropped from the right angle on the hypothenuse, the rectangle contained by the hypothenuse and one of its segments shall be equal to the square on the side of the triangle adjacent to that segment.

7 If a straight line be divided into two equal and also into two unequal parts, the squares of the two unequal parts are together double of the square of half the line, and of the square of the line between the points of section.

CLASS D.—CHEMISTRY (Optional)
Time allowed Three hours

1. Write down the names and symbols of all the known oxides of the following elements H, N, P, S, C, Si.
2. Express 100° F in terms of degrees Centigrade, and 200° C. in terms of degrees Fahrenheit.
3. Write down equations to show how the following gases are made O, H, Cl, CO_2, SO_2, CO, H_2S.
4. How would you explain to a class the difference between a *chemical compound* and a *mixture* ?
5. Explain how you would show the properties of the following gases O, H, Cl, CO_2, N, NH_3.
6. What weight of hydrogen is liberated by the action of 100 grammes of sodium on water? (Na=23.)
7 How much oxygen by weight is got by heating 100 grammes of chlorate of potassium ? (K=39.)
8. Explain fully how sulphuric acid is made.
9. Explain how either *ammonia* or *bleaching powder* is made.
10. State what you know about either *ozone* or the *diamond*.
11. What is the chemical action of chlorine as a bleacher and disinfectant?
12. In what ways do plants and animals affect the atmosphere ?

CLASS D.—ELECTRICITY (Optional)
Time allowed · Three hours

1. Describe the details of construction and the properties of an electro-magnet.
2. How would you test the kind of electricity in a body, using for the purpose a gold-leaf electroscope ?
3. Describe and explain the action of any form of induction electric machine.
4. Describe the quadrant electrometer, and contrast the use of electroscopes that act by induction alone with those that have a constant charge.
5. Give a description of a lightning conductor, explain its action, and state the area it is supposed to protect.
6. What are the chemical changes of a Bunsen's battery? Explain fully why it is so much more useful for experimental purposes than a copper and zinc one-fluid cell.
7. Give an account of experiments to illustrate the elementary principles of magneto-electric induction.
8. Describe any form of dynamo-electric machine used for generating electricity for ordinary electric light.
9. Make a sketch illustrating a Morse telegraph with relays.
10. Describe some form of apparatus for estimating temperature by means of electricity

CLASS D.—SOUND AND LIGHT (Optional)
Time allowed Three hours

1. What circumstances affect the velocity of sound in a body? How is the velocity of sound in a glass rod ascertained?
2. Give an account of the phenomena of resonance. What use is made of it in musical instruments?
3. Describe how the character of a musical note has been determined, either by synthesis or analysis.
4. What are the laws of the vibrations of strings? Upon what does the character of the note of a string depend?
5. What are the laws of reflection? Draw a diagram to illustrate the formation of a virtual image in a convex mirror
6. Show by a diagram how an image is formed in a camera.
7 What is the difference between a beam of red polarized light and one of solar light?
8. Describe the stereoscope.
9. Show how the image is produced by means of any form of telescope.
10. Describe a spectroscope, and state the kind of spectrum that is given by solar and by stellar light.

CLASS D.—HEAT (Optional)
Time allowed Three hours

1. How is the coefficient of absolute expansion of mercury determined? What is its value ?
2. Name the several methods of determining specific heat. Describe the method of mixtures in detail.
3. Describe the mode of determining the relative conductivity of liquids. Why does a liquid get hot more quickly when the heat is applied to the bottom than when it is applied to the top of the vessel?
4. What are the laws of ebullition ? Describe the phenomena of boiling water
5. Describe the formation of dew Upon what circumstances does its copious formation depend?

6. What are the various modes of producing artificial freezing? Describe in detail the method by means of expansion of air

7 What are the two specific heats of gases? Which is the greater? State why it is so.

8. Describe all the changes of energy that take place when a cannon is fired.

9. If 10 lb. of water at 30° C. be mixed with 1 lb. of steam at 100° C. and 5 lb. of ice at 0° C., what will be the resultant temperature?

10. Describe the theory of exchanges. A piece of red glass is brought to the temperature of white heat describe its appearance both in and out of the furnace.

CLASS D.—BOTANY (Optional).

Time allowed Three hours

1. Describe the principal inflorescences in flowering plants, illustrating your remarks with diagrams.

2. Describe a typical vegetable cell and its contents.

3. Describe the structure of a perfect dicotyledonous leaf, and define scales and bracts.

4. Explain the terms Hypogynous, perigynous, epigynous, epipetalous, syngenesious.

5. Give an account of the movement of water in plants.

6. Describe the different ways in which a carpel, or carpels, form ovaries.

7 What is the meaning of " Phyllotaxis $\frac{3}{8}$"?

8. Describe the flower in Violet, apple, veronica, hyacinth, gladiolus, grass.

9. Describe some of the phenomena caused by geotropism and by heliotropism respectively

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CLASS D.—GEOLOGY (Optional).

Time allowed Three hours.

1. What are the names and compositions of the commonest minerals found in rocks?

2. What is mica-schist? How was it formed?

3. Mention all the kinds of eruptive (igneous) rocks you know, and describe them.

4. Explain the origin of ordinary compact limestone, and of chalk, giving reasons for your opinion.

5. Explain what is meant by a " fault."

6. What is meant by cleavage in rocks? Compare it with cleavage in minerals.

7 Give a list of the periods into which geological time is divided.

8. Describe the structure, origin, and movements of a glacier

9. Explain the origin of river terraces.

CLASS D.—FRENCH (Optional)

Time allowed. Three hours

1. Translate into French—Henry the First, Henry the Second, Henry the Third; August the first, August the second, on the third of August.

2. Translate also—Ten minutes past five, a quarter past five, half-past five, a quarter to six, five minutes to six.

3. What is the gender (in French) of metals? Support your statement by three examples.

4. Give the plural of Clin d'œil, franc-maçon, oiseau-mouche, avant-poste, monseigneur

5. Give the possessive adjective pronouns (conjunctives) and the possessive substantive pronouns (disjunctives) for both genders and both numbers.

6. Give the meanings of Le champ, le chant; le cœur, le chœur, le jeûne, jeune, la tante, la tente, la voie, la voix.

7 Translate into French—An iron-mine, a windmill, the rabbit-man, the cream-jug, the grey-haired man.

8. Translate into French—He who, she who, they who (mas.), they who (fem.)

9. Translate also—He is speaking about him. Have you your keys about you? I shall be here in about an hour Do not always have him about you.

10. Translate also—These cherries are sixpence a pound. This muslin is a shilling a yard. Coals are half-a-crown a hundredweight.

11. The passive voice is much less used in French than in English in what way should one express one's-self to avoid the passive in French?

12. Translate into French—Half an hour, an hour and a half. You will catch cold if you go bare-footed. Her feet were bare. The late Queen was much respected. (Translate this last sentence in two ways.)

13. Write out in full interrogatively the future simple of s'en souvenir, using est-ce-que.

14. Write out in full the present indicative of se flatter negatively

15. Write out the third person singular of every tense, simple and compound, of s'étendre.

16. Write out the preterite definite of cueillir

17. Give the past participle of the following verbs. Parcourir, consentir, revêtir, interdire, feindre, complaire, dissoudre, extraire, repaître, émoudre.

18. Voilà de jolis enfants, je les ai vus jouer La pièce que j'ai vu jouer In the above examples, explain why in the one instance the past participle vu varies, and in the other it does not.

19. Explain the difference between savoir and connaître.

20. Put the proper preposition (if any is required) after the following verbs Penser (to think), rire (to laugh at), oser (to dare), aider (to assist in), offrir (to offer to).

21. Translate into English,—

     " Que de danses le soir égayaient la pelouse '
     Plus le jour retirait sa lumière jalouse,
     Plus elles s'animaient, comme pour resaissir
     Ce que l'heure fuyante enviait au plaisir
     Chaque arbre du verger avait son chœur champêtre,
     Son orchestre élevé sur de vieux troncs de hêtre—
     Le fifre au cris aigus, le hautbois au son clair,
     La musette vidant son outre pleine d'air
     L'un sautillant et gai, l'autre plaintive et tendre,
     S'accordant, s'excitant, s'unissant pour répandre
     Ensemble, ou tour à tour, dans leurs divers accents,
     Le délire ou l'ivresse à nos cœurs bondissants.
     Tous les yeux se cherchaient, toutes les mains pressées
     Frémissaient de répondre aux notes cadencées.
     Un tourbillon d'amour emportait deux à deux
     Dans sa sphère de bruit les couples amoureux,
     Les pieds, les yeux, les cœurs qu'un même instinct attire,
     S'envolaient soulevés par le commun délire,
     S'enchaînaient, se brisaient, pour s'enchaîner encore.
     Tels, quand un soir d'été darde ses rayons d'or
     Dans le sable échauffé qui brille sur la grève,
     On voit les tourbillons d'atomes qu'il soulève
     Monter, descendre, errer, s'enlacer tour à tour,
     Comme à l attrait caché d'un invisible amour,
     Dresser en tournoyant leur brillante colonne,
     Et danser dans la sphère où le soleil rayonne."

22. Translate also into English,—

     " Je suis très-content de recevoir une lettre de vous, et encore plus lorsque j'en lis le contenu. L'ouvrage dont vous me parlez se recommendera suffisamment sans doute quand votre nom paraîtra sur le prospectus et, si vous croyez que je puisse vous rendre quelque service dans cette affaire, vous ne sauriez me faire un plus grand plaisir que de m'y employer

     " Comme j'ambitionne beaucoup de faire connaître que vous êtes mon ami, j'aurai grand plaisir à le montrer en cette occasion, ou en toute autre quelconque. Je ne doute pas que notre langue ne soit enrichie par votre traduction, ni qu'elle ne fasse honneur à notre patrie, car j'en juge déjà d'après ces productions dont vous avez gratifié le public. Je désire seulement que vous réfléchissiez sur la meilleure manière d'y trouver votre compte. Excusez mon impatience à ce sujet, elle vient de mon zèle pour votre bonheur. L'ouvrage vous coûterait beaucoup de temps, et à moins que ce ne soit vous qui l entrepreniez, il ne sera jamais executé par un autre, c'est à dire, je ne connais personne dans notre siècle excepté vous-même qui en soit capable.

     " Je suis à présent entièrement adonné à des occupations rurales, et je commence à m'y plaire beaucoup. Je désire vous voir ici, et je n en désespérerai pas quand vous serez engagé dans un travail qui demandera la solitude et la retraite.

                             " Je suis, &c."

CLASS D.—GERMAN (Optional)

Time allowed   Three hours

     1. What difference in meaning is there between *Gesichter* and *Gesichte*, *Hörner* and *Horne*, *Länder* and *Lande*, *Wörter* and *Worte*, *Zolle* and *Zölle* ?

     2. Give the meanings of *die Gift* and *das Gift*, *die Mark* and *das Mark*, *der Ohm* and *das Ohm*, *der Sprosse* and *die Sprosse*, *der Stift* and *das Stift*.

     3. Give the nom. plur of *die Braut*, *der Engel*, *das Auge*, *die Nadel*, *die Hand*, *das Jahr*, *das Volk*, *die Welt*, *das Kloster*, *das Floss*.

     4. Decline *Lessing, Max, Bertha, Sophie.* (Here and elsewhere use abbreviations when practicable.)

     5. Give the masculine nouns corresponding to the following feminine nouns *die Tante, die Base, die Jungfer, die Braut, die Wittwe.*

     6. Translate — It is I. Whose book is this? Which is your pen? What kind of horse do you ride?

     7. Compare *wohl, bald, gern.*

     8. Decline *er sie* (she), *sie* (they), *es.*

     9. Decline *derjenige.*

     10. Give the past part. of *liebkosen, weissagen, gutsagen, vollbringen, vollziehen.*

     11. Give the principal parts of *klingen, treffen, gähren, messen, reiben.*

     12. Express impersonally—I have a foreboding. I feel disgusted. My heart misgives me.

     13. How is the gerundive expressed in German?—*e.g.*, A punishment which must be borne A fault which is to be excused.

     14. What auxiliary is used in German to form the passive voice?

     15. Give the whole conjugation of *es blitzt.*

     16. Give the pres. and imperf. ind. and the pres. and imperf. subj in full of *mögen, dürfen, wollen* and *sollen.*

17 Give the pres. ind. in full of *Ich schmeichle mir*

18. Give some (say six) prepositions governing the genitive case.

19. Translate   Towards five o'clock, at this moment at sunrise three months ago, this day week eight days)

20. Put the appropriate preposition after *achtsam, eifersüchtig, froh, grausam, stolz.*

21. Translate into English,—

"In dem vielgepriesenen Paradiese Nizza galt im Jahre 1805 für eine der schönsten Villen die in dem tiefen dunkeln Grün eines wundervollen Gartens versteckte Villa des Fürsten Camillo Borghese, Prinzen von Frankreich, Herzogs von Guastalla. Sie wurde damals von einer der bezauberndsten Frauen ihrer Zeit bewohnt, von der zweiten Schwester Napoleon Bonaparte's der Fürstin Paulina. Von der Terasse des Gartens blickte man auf das blaue Meer, auf uralte Cypressen und Orangenbäume, auf blühende Gebüsche und Rosenhecken ; der ganze volle Zauber des Südens, den der tiefe Ton der Riesenorgel des brausenden Meeres durchzitterte, leuchtete jenen Glücklichen entgegen die dort lebten und athmeten. Wir armen Kinder des Norden und langem Herbst und Winter, ahnen jene lachende Glückseligkeit der natur nur in unsern Träumen.—Hohe Mauern schlossen dies beneidenswerthe Besitzthum ab von der neugierigen Welt. Das rauschen und Plätschern der Springbrunnen und Cascaden tönte wie Aeolsharfenklang in das ferne Brausen der Meereswellen marmorne Göttergestalten erhoben ihre schlanken edlen Leiber aus dem Grün und dem Gewirr immerblühender Rosen. Im Hause selbst Verschwendung von Marmor, Gold, Fresken und kostbaren Stoffen—ein Nestchen kühl und warm zugleich. Liebesgötter über all, an den Wänden, an den Decken, Blumen mit vollen Händen niederstreuend auf die lebendige Venus, die hier wandelte und ruhte, lächelte, plauderte und sang Paulina Borghese."

22. Translate also,—

" Das Wasser rauscht', das Wasser schwoll,
Ein Fischer sass daran
Sah nach der Angel ruhevoll,
Kühl bis an's Herz hinan.
Und wie er sitzt, und wie er lauscht
Theilt sich die Fluth empor ,
Aus dem bewegten Wasser rauscht
Ein feuchtes Weib empor

" Sie sang zu ihm, sie sprach zu ihm
' Was lockst du meine Brut
Mit Menschenwitz und Menschenlist
Hinauf in Todesgluth ?
Ach ! wüsstest du, wie's Fischlein ist
So wohlig auf dem Grund,
Du stieg'st herunter, wie du bist,
Und würdest erst gesund.

" Labt sich die liebe Sonne nicht
Der Mond sich nicht im Meer ?
Kehrt wellenathmend ihr Gesicht
Nicht doppelt schön sich her ?
Lockt dich der tiefe Himmel nicht,
Das feuchtverklärte Blau ?
Lockt dich dein eigen Angesicht
Nicht her in ew'gen Thau ? '

" Das Wasser rauscht' das Wasser schwoll,
Netzt' ihm den nackten Fuss ,
Sein Herz wuchs ihm so sehnsuchtsvoll,
Wie bei der Liebsten Gruss.
Sie sprach zu ihm, sie sang zu ihm ,
Da war's um ihn gescheh'n
Halb zog sie ihn, halb sank er hin,
Und ward nicht mehr geseh'n."

CLASS D.—GREEK (Optional).

Time allowed   Three hours

1. Decline ἀνήρ, πόλις, χείρ, οὗτος. Give the first person singular of the tenses in use of βαίνω, λαμβάνω, θνήσκω, τρέχω, φέρω.

Parse ἴσασι, ἴστε, ᾔδεσαν.

2. Which are the transitive tenses of ἴστημι ? What is the meaning of ἐστησάμην ? Distinguish between ἔστη, εἱστήκει, ἐστάθη.

3. State what you know of the use of the prepositions ἐπί, διά, πρός, with their several cases. Frame sentences illustrating these meanings.

4. Express in Greek—

(1.) Most men are well-disposed to the poor
(2.) What is more hostile to men than vice ?
(3.) Poets were loved and honoured by the Athenians.
(4.) Do not call any man great until you see him dead.
(5.) He knows that he has himself often done the same thing.
(6.) He has a right to be praised by his fellow-citizens.

5. Translate—Οἱ δὲ Θηβαῖοι εὐθὺς μετὰ τὴν μάχην ἔπεμψαν εἰς Ἀθήνας ἄγγελον ἐστεφανωμένον, καὶ ἅμα μὲν τῆς νίκης τὸ μέγεθος ἔφραζον, ἅμα δὲ βοηθεῖν ἐκέλευον, λέγοντες ὡς νῦν ἐξείη Λακεδαιμονίους πάντων ὧν ἐπεποιήκεσαν αὐτοὺς τιμωρήσασθαι. τῶν δὲ Ἀθηναίων ἡ βουλὴ ἐτύγχανεν ἐν ἀκροπόλει καθημένη. ἐπεὶ δ' ἤκουσαν τὸ γεγενημένον, ὅτι μὲν σφόδρα ἠνιάθησαν πᾶσι δῆλον ἐγένετο οὔτε γὰρ ἐπὶ ξενίᾳ τὸν κήρυκα ἐκάλεσαν, περί τε τῆς βοηθείας οὐδὲν ἀπεκρίναντο.

[Note.—τιμωρεῖσθαί τι τινα = to take revenge upon a person for a thing. ἀνιᾶν = to annoy.]