TEACHERS' EXAMINATION.

September, 1896.

THE following Papers, set at the Examination for Teachers' Certificates held in September, 1896, are published for general information.

O. P. STABLES,
Secretary for Education.

Education Department,
Perth, May 1st, 1897.

"Failing" Subjects.

"A.," "B.," AND "C.," CERTIFICATES.

WRITING.

1. Write in text hand:—New South Wales.
2. Write in half text:—Madrid, the capital of Spain.
3. Write in small hand:—the alphabet in capital and small letters.

SPELLING.

1. Write the Dictation Exercise selected.
2. Marks will be deducted for incorrect spelling in any of the worked papers.

ARITHMETIC ("A.," "B.," AND "C.") AND MENSURATION ("A." AND "B.").

Candidates for			Questions
Candidates for " C." Certificate may answer			1 to 15
,,	" B."	,, ,,	6 to 20
,,	" A."	,, ,,	11 to 25 inclusive.

Three hours allowed.

1. Multiply MDCCLXXVII. by twelve thousand twelve hundred and twelve ; and express the result in words.
2. Multiply 1ac. 1ro. 1po. 1yd. 1ft. 1in. by 30 (by factors).
3. Explain the meanings of " unit " ; " abstract number " ; " concrete number " ; " prime number " ; " digit " ; " cipher."
4. How many minutes are there in five following years of which 1896 is the first ?
5. If the moon moves forward in her orbit 57° 1' 18" in 13 days, calculate her daily motion.
6. A bar of gold weighing 196lbs. 10oz. 10dwts. is cased in lead weighing 24lbs. 14oz. Find the whole weight avoirdupois.
7. Divide £53 15s. 8d. by 6 $\frac{19}{17}$.
8. How many times is £17 12s. 9¼d. contained in £1,393 8s. 10⅞d. ?

9. Find the highest Common Factor of 51,975 and 67,276 : and the least Common Multiple of 27, 91, 42, 36, 63, 156, 234.

10. Find, by Practice, the value of 362¼ articles at £7 16s. 2¼d. each, and prove your answer by multiplication.

11. Find, by Practice, the value of 5ac. 3ro. 4po. 4½yds. at £10 per rood.

12. After paying 4d. in the pound income tax a person has £299 18s. 4d. left. What was his original income ?

13. How much bread can I get for 9d., when wheat is at 4s. 6d. a bushel ; if the fourpenny loaf weigh 3lb. when wheat is at 5s. a bushel?

14. Multiply the sum of the fractions 3⅖ and 2$\frac{7}{10}$ by their difference.

15. Simplify :—

$$\left\{ \frac{1 + \cdot 1\dot{6}}{1 - \cdot 1\dot{6}} + \frac{1 - \cdot 1\dot{6}}{1 + \cdot 1\dot{6}} \right\} \text{ of } 1oz. \text{ 15dwts.}$$

16. If stock which is bought at 91½ is immediately sold at 91⅓ ; what is the gain per cent. ?

17. Find the Compound Interest of £55 for one year payable quarterly at 5 per cent. per annum ?

18. By selling goods at 8s. 2d. a tradesman gains 16⅗ per cent. What will be the gain or loss per cent. by selling at 6s. 1½d. ?

19. Find the values of :—

$$\sqrt{2\cdot5} \cdot \quad \sqrt{\cdot25} ; \quad \sqrt[3]{14832537993}$$

to three decimal places.

20. How many flagstones, each 5·76 feet long and 4·15 feet wide, are requisite for paving a cloister which encloses a rectangular court 45·77 yards long and 41·93 yards wide, the cloister being 12·45 feet wide ?

21. A pyramid on a square base has every edge 100 feet long. Find the edge of a cube of equal volume. (Two decimal places.)

22. Find the weight of rainfall one inch in depth over an acre, if a cubic foot of water weighs 1,000ozs. (Answer in tons.)

23. If 12 horses eat 10 acres of grass in 16 weeks, and 18 horses eat 10 acres in 8 weeks, how many horses would eat 40 acres in 6 weeks, the grass being supposed to grow uniformly?

24. Three partners in trade contributed respectively the sums of £438, £292, £730, with the agreement that each was to receive 5 per cent. on their respective investments, and that the remainder of the gains of the firm, if any, was to be divided between them in the [proportion of the sums originally advanced. The whole gain of the firm was £200. What was each man's share?

25. The population of a country has increased during the last ten years from 735,894 to 852,191. What will it be twenty years hence at the same rate?

English.

Three hours allowed for this Paper.

"C." CERTIFICATE.

1. Define Speech, Grammar, Sentence, Syntax.

2. How are Nouns classified? In what different ways is Gender indicated?

3. Distinguish between co-ordinative and subordinative conjunctions. What words frequently take the place of the latter?

4. Explain clearly the difference between participle and gerund, forming sentences as examples.

5. Give the meaning and derivation of the following words, and show the origin and the signification of the suffix in each:—wisdom, hillock, landscape, hatred, worship, tabernacle, ornament, quarrelsome, awkward.

6. Give examples of a noun clause, noun phrase, adverbial clause, adverbial phrase, and point out the difference between them.

7. Paraphrase the following lines from Tennyson's "Oenone":—

    Self reverence, self knowledge, self control,
    These three alone lead life to sovereign power;
    Yet not for power (power of herself
    Would come uncalled for), but to live by law,
    Acting the law we live by without fear;
    And because right is right to follow right
    Were wisdom in the scorn of consequence!
    Dear mother Ida, hearken ere I die.
    Again she said: "I woo thee not with gifts.
    Sequel of guerdon could not alter me
    To fairer. Judge thou me by what I am,
    So shalt thou find me fairest!"

8. Analyse (a.) If civilisation corrects *many* prejudices, *it must be* allowed that it creates many *others*.

    (b.) *That* trade *should prove* the path to eminent political preferment in a nation *but* partially civilised, *where* the names of soldier and priest are usually the only *titles to* respect, *is* certainly an *anomaly* in history.

9. Parse all words in italics in the preceding question.

10. Write an essay on "The Federation of Australia."

"A." AND "B." CERTIFICATE.

1. Give a list of Interrogative and Relative Pronouns, and distinguish fully the use of each.

2. Give the form of the Subjunctive Mood in modern English, and construct sentences to show its use.

3. Give the preterite and past participle of the following verbs, and state to which conjugation—strong or weak—each belongs:—hold, sell, bereave, catch, awake, lose, lie, feed, work, buy, bind.

4. Give the derivation of the following words:—female, bequeath, fight, democracy, architect, hereditary, bishop, damson, constable, sergeant.

5. Give a list of the different classes of adverbs, with examples.

6. Correct the following sentences, giving reasons for each correction.

    (a.) Having finished the chapter the volume was shut.
    (b.) Nothing but grave and serious studies delight him.
    (c.) Of all men else I have avoided thee.
    (d.) I was going to have written him a letter.
    (e.) The Thames is derived from the Latin Thamesis.

7. Define compound, collateral, contracted, and elliptical sentences and give examples.

8. Paraphrase the following passage:—

    How all occasions do inform against me
    And spur my dull revenge! What is a man
    If his chief good and market of his time
    Be but to sleep and feed? A beast, no *more*.
    Sure, He that made us with such large discourse,
    Looking before, and after, gave us not
    That capability and Godlike reason
    To fust in us *unused*. Now *whether* it be
    Bestial oblivion, or some craven scruple
    Of *thinking* too precisely on the event,—
    A thought, which, quartered, hath but one part wisdom,
    And, ever, three parts *coward*—I do not know
    Why yet I live to say, This thing's to do:
    Sith I have cause, and will, and strength, and means
    To do 't. Examples, gross as earth, exhort me:
    Witness this army of such mass and charge,
    Led by a delicate and tender prince;
    Whose spirit, with Divine ambition puffed,
    Makes mouths at the invisible event;
    Exposing what is mortal and unsure
    To all that fortune, death, and danger *dare*,
    Even for an egg-shell.

9. Parse all words *in italics* in the preceding question.

10. Analyse the following sentences:—

    (a.) My Liege and Madam, to expostulate
        What Majesty should be, what duty is;
        Why day is day, night, night, and time is time,
        Were nothing but to waste night, day, and time.

    (b.) But since we have said it were good not to use men of ambitious natures, except it be upon necessity, it is fit we speak in what cases they are of necessity.

    (c.) It is a strange thing that in sea voyages, when there is nothing to be seen but sea and sky, men should make diaries.

    (d.) The Spaniards could not conceal their rapture at the exhibition of treasures which so far surpassed all the dreams in which they had indulged.

11. Write an essay on "The advantages and disadvantages of the payment of Members of Parliament."

GEOGRAPHY.

"B." AND "C." CERTIFICATES.

One and a half hours allowed for this Paper.

"C." Candidates may select 6 questions, from 1 to 7 inclusive.
"B."   "   "   "   "   "   " 6 to 12   "

1. Draw a map of the Baltic Sea, showing islands, openings, rivers, and chief seaports.

2. Name in order the capes, openings, towns and countries you would pass in a coasting voyage from Brest to Genoa.

3. Describe in words, or by a sketch map, the basin of one of the following rivers:—Rhine, Danube, or Volga.

4. Name six of the principal towns in Scotland, also six in Ireland. Give the position of each, and one interesting fact for which each is noted.

5. Say where the following are obtained in Europe or Australia:—pearls, pine, amber, currants, lace, sugar, and olives.

6. Draw an outline map of that portion of Australia which lies to the North of the Tropic of Capricorn.

7. What, and where are:—Eucla, Baikal, Congo, Alleghanies, Illimani, Winnipeg, Yesso, Pampas, S. Roque?

8. Distinguish between permanent, periodical, and variable winds. Name the permanent and periodical winds, and the parts of the world in which variable winds are most prevalent. Give concisely the causes of the permanent winds.

9. Say what you know about the following British possessions:—Hong Kong, St. Helena, British Guiana, Perim, and Jamaica. When and how was each acquired?

10. Name in order the countries, islands, oceans, and seas through which the Equator passes, commencing in America.

11. Describe in words, or by sketch map, the basin of one of the following rivers:—Amazon, Indus, or Nile.

12. How are clouds formed? Classify the different kinds of clouds. Explain clearly how rain and snow are formed.

"A." CERTIFICATE.

Time allowed : One and a half hours.

Six questions may be taken.

1. In a voyage from Esperance to Wyndham, name in order the towns, rivers, capes, bays, islands, and districts passed.
2. State as precisely as you can, where each of the following is,—and give, as concisely as you can, some interesting information about each :—Baku, Barbadoes, Elephanta, Thursday Island, Hokitika, Samoa, the Yosemite Valley.
3. Explain briefly Atolls, Selvas, Steppes, Tundras, Dollar Rupee, Boer, Mandarin, Buddhist.
4. Name the one chief region from whence tin, platinum, petroleum, jute, mohair, caoutchouc, tapioca, pepper, indigo, and amber are severally obtained.
5. Draw a map of the Mediterranean Sea, naming the countries, seaports, and islands only.
6. What is the form of Government in France, China, Switzerland, Western Australia, Italy and Canada ?
7. A ship is in latitude 40° 40′ S. and longitude 92° W. Find the latitude and longitude of that part of the earth which is farthest from the ship.
8. What are the chief causes of ocean currents ?

School Management.

Two Hours allowed.

"C." CERTIFICATE.

1. How would you distinguish between discipline and order? Name some marks of good discipline.
2. If appointed to a newly-opened bush school, how would you proceed to organise it ? Give reason for your methods.
3. What are the chief causes of failure in the arithmetic of Standards I. and II. ? Explain briefly how you would try to remove these causes of failure.
4. Show how you would use the Geographical Chart, now supplied to all schools, in teaching the definitions to Standard II.
5. Give notes of a lesson on the orange to the younger children.

"B." CERTIFICATE.

1. Explain how you would teach the following example in subtraction to the children of Standard I. :—

    269
    182

2. Discuss fully the value of teaching the children to (1) frame their answers in complete sentences ; (2) to form sentences containing given parts of speech.
3. Show clearly the differences between Inductive and Deductive Methods of Teaching. Give an example of each method.
4. Write out notes of a lesson on one of the following :—coal ; the vine.
5. What registers are required to be kept in schools in Western Australia ? Show why each is necessary.
6. Question 3 of "C." Certificate.

"A." CERTIFICATE.

The Candidate may attempt any *eight* questions.

1. Give reasons for and against corporal punishment.
2. Apart from higher moral qualifications, what are the special gifts, acquirements, and aptitudes which should distinguish a good Teacher ?
3. What do you understand by the Socratic method of instruction ?
4. Name the advantages, and possible abuses of Home Lessons.
5. What apparatus is desirable for the intelligent teaching of Geography in a school ?
6. State briefly the chief features of School organisation in the systems of (*a.*) Bell, (*b.*) Lancaster, (*c.*) Stow.
7. How would you cultivate or strengthen the memory of children ?

8. What are the chief causes found in schools which render the eye liable to injury ? How may they best be avoided ?
9. What is the meaning and object of Education ?
10. What knowledge of Arithmetic is required in this Colony in Standards I to VII respectively ?

OTHER SUBJECTS.

History.

Time allowed : One and a half hours.

Candidates for—
"C." Certificate may answer questions 1 to 6 inclusive.
"B." 　　 " 　　 " 　　 " 　　 5 to 10 　 "
"A." 　　 " 　　 " 　　 " 　　 9 to 15 　 "

1. Give some account (with dates) of the invasion and occupation of Britain by the Romans, and the date and reason of their withdrawal.
2. State briefly some particulars about any *three* of the following :—Danegelt, Ship Money, Thorough, National Debt, Star Chamber, with dates where necessary.
3. (*a.*) Draw a family tree of the Stuart sovereigns, with dates of accession.
   (*b.*) State the causes which led to their downfall.
4. (*a.*) Give dates to the following events :—
   First Parliament in England.
   Accession and death of Alfred the Great.
   Battles of Agincourt, Bosworth, Ramilies, Bannockburn.
   Declaration of Independence.
   Rebellion of the Old Pretender.
   (*b.*) Assign notable events to the following dates :—
   1399, 1805, 1689, 787, 1588, 1215, 1422, 1690.
5. Write a short account of *one* of the following :—
   Oliver Cromwell.　　　　Wolsey.
   Warren Hastings.　　　　Thomas à Becket.
6. When was the East India Company established? Give a brief sketch of its career, and the cause of the withdrawal of its political power in India.
7. Give a short account of the Crusades, their numbers and dates, and effect on Europe generally.
8. (*a.*) Describe briefly the Feudal System introduced by the Normans, and state whether any portion of it still exists.
   (*b.*) Explain the terms :— Aids, wardship, relief, scutage, escheat.
9. (*a.*) On what grounds did Edward III. claim the throne of France, and were they valid ?
   (*b.*) Give, with dates, the principal battles fought in support of these claims, and by whom won.
   (*c.*) What possessions in France were held by England at the close of this war ?
10. Give date and short account of any *five* of the following :—
    a. Constitutions of Clarendon.
    b. Petition of Right.
    c. Habeas Corpus Act.
    d. The Cabal.
    e. Act of Uniformity.
    f. Lollards.
    g. Statute of Mortmain.
    h. South Sea Company.
    i. The first Reform Bill.
11. On what grounds did George I. come to the throne of England, and show by a genealogical tree his connection with a previous dynasty ?
12. State the causes which led to the American War of Independence, giving dates and a short sketch of the proceedings, with the names of the principal commanders on both sides.
13. Discuss the claims of James I. to the throne of England, and draw a genealogical tree in support of the same.
14. Give an account of notable maritime discoveries and discoverers in the 16th century.
15. Trace the rise of Parliamentary representation, with dates.

Needlework (Females).

Time allowed : One and a half hours.

"A." CERTIFICATE.

1. To darn on coarse linen a hedge tear darn, not more than half an inch both ways.
2. To whip a piece of frilling 3 inches long and sew it into a piece of calico 2 inches long.
3. Cut out a nightdress for a child of about 4 years of age, marking the dimensions of the various parts in pencil.

"B." CERTIFICATE.

1. To darn a cross-cut darn of 1 inch on a piece of coarse linen.
2. To make a band of 2½ inches, and on it work a buttonhole bridged at both ends.
3. Cut out drawers for a child 4 years of age, marking the dimensions in pencil.

"C." CERTIFICATE.

1. Darn a hole 1 inch square on stocking web material.
2. Gather, stroke, and fix a piece of calico 3 inches long into a band 2 inches long.
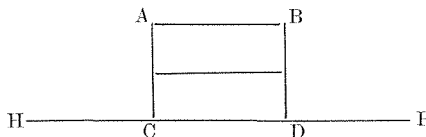3. Cut out a chemise for a child 4 years of age, and mark the dimensions in pencil.

N.B.—The first question of every set must be taken.

Drawing.

Freehand.

"A.," "B.," AND "C." CERTIFICATES.

The copies set in Freehand Drawing were chosen from the "Royal" Series of Test Papers.

Geometry.

"B." CERTIFICATE.

1. Construct an oblong, having one side equal to A B, and a diagonal equal to C D.
2. Divide the right angle A B C into three equal parts.
3. On the line A B construct a heptagon.
4. Describe the curve of an ellipse, having the two diameters or axes equal to A B and C D.
5. Construct an equilateral triangle, A B being the altitude.
6. (a.) Draw the end elevation of the regular hexagonal prism of which A B C D is the side elevation.
   (b.) Draw the plan of the same hexagonal prism.

Model.

"A." CERTIFICATE.

Combination of cube, cylinder, and cone.

Blackboard Drawing.

To draw on the blackboard, from memory, common objects such as candlestick, box (lid open), cup and saucer, vase, &c.

Drill.

The candidates were examined orally. Each candidate was placed in charge of a class, and was required to put the children through various movements selected by the examiner.

English Literature.

"B." CERTIFICATE.

Time allowed : One and a half hours.

1. What are the characteristics of the oldest English Poetry
2. What do you know of the Canterbury Tales ?
3. What were Miracle, Mystery, and Morality Plays—Masques ? Mention any examples of the last that survive, giving the date and the author.
4. How are Shakespeare's plays grouped ? What are the characteristics of his different periods ?
5. Write a short account of the origin and growth of the Novel in English Literature.
6. Write a short note on each of the following writers :—William of Malmesbury, Sir John Mandeville, Samuel Butler, Sheridan, Defoe, "Junius," Drummond of Hawthornden, Congreve, Samuel Pepys, Steele.
7. Give, in a few lines, a description of Auburn before its desertion.
8. Explain the following passages, and show in what connection each occurs :—
   (a.) Proud swells the tide with loads of freighted ore, And shouting Folly hails them from the shore.
   (b.) Where wild Altama murmurs to their woe.
   (c.) Creation's heir, the world, the world is mine.
   (d.) Heavens, how unlike their Belgic sires of old.
   (e.) And late the nation found with fruitless skill Its former strength was but plethoric ill.
9. ketch the character of Goldsmith.

"A." CERTIFICATE.

Two hours allowed.

1. Explain the following passages in "Othello," and show in what connection they occur :—
   (a.)　　　　　　　　　　　　　My demerits May speak, unbonnetted, to as proud a fortune As this that I have reached.
   (b.) Were it my cue to fight, I should have known it Without a prompter.
   (c.) I do not so secure me in the error, But the main article I do approve In fearful sense.
   (d.) For nature so preposterously to err, Being not deficient, blind, or lame of sense, Sans witchcraft could not.
   (e.) The robbed that smiles steals something from the thief; He robs himself that spends a bootless grief.
   (f.) Thus do I make my fool my purse.
   (g.) I do follow here in the chase, not like a hound that hunts, but one that fills up the cry.
   (h.) Like to the Pontic Sea.
   (i.) Our bodies are our gardens ; to the which our wills are gardeners.
   (j.) It is the very error of the moon ; She comes more nearer earth than she was wont And makes men mad.
2. Write notes on the meaning and derivation of the following words :—grange, cast, carouse, exsufflicate, quillets, seel, mandragora, crusadoes, chrysolite.
3. Explain fully, and illustrate either from this play or Bacon's Essays, the following terms :—metaphor, simile, alliteration.
4. Write a short account of Bacon's life.
5. What does Bacon say are the causes of superstition ?
6. Distinguish between Subjective and Objective Truth. What are Public Revenges ?
7. Write critical and explanatory notes on the following passages :—
   (a.) The poet that beautified the sect, that was otherwise inferior to the rest.
   (b.) Revenge is a kind of wild justice.
   (c.) Chanting a *quanta patimur*.
   (d.) As for facility it is worse than bribery.
   (e.) Money is like muck.
8. Give a plan showing the different branches of the Aryan family.
9. What examples of (1) Celtic, and (2) Scandinavian words are found in modern English ?
10. How far has the syntax of the English language been affected by Latin and French ?
11. Give the derivation and meaning of the following suffixes with examples of words compounded of them :—age, —ain, —al, —and, —ar, —ism, —ee, —le.

Domestic Economy (Females).

"B." CERTIFICATE.

One and a half hours allowed.

1. Explain the correct method of washing: (1) Flannels, (2) Laces.
2. What is a condiment? Name the chief condiments, and say what you know about the origin and uses of any two of them.
3. What are the chief narcotics? Name the symptoms of narcotic poisoning, and the remedies you would apply.
4. Describe the correct method of making a bed.
5. What is the daily routine of household work.
6. Name six methods of cooking meat, and describe the most economical.
7. What measures would you take to restore a case of drowning?

Sanitation (Females).

"A." CERTIFICATE.

One and a half hours allowed.

The candidate may attempt any *six* questions.
1. With what discoveries are the names of Howard, Cook, and Jenner associated?
2. Describe the essential nature of a digestive system.
3. How can water be distilled and aerated?
4. What is ozone? How is its presence detected?
5. Show how tight lacing is injurious?
6. How would you disinfect a room after its occupancy by a fever patient?
7. How would you remove a foreign body from the eye and ear respectively?
8. How should infants be clothed? Criticise prevalent errors in the dress of young children.

Mathematics (Males).

"B." CERTIFICATE.

The usual abbreviations may be used.

Three hours allowed.

1. In a right angled triangle the square described on the hypotenuse is equal to the sum of the squares described on the other two sides.
2. To describe a square that shall be equal to a given rectilineal figure.
3. The angle in a semi-circle is a right angle.
4. The straight line which joins the middle points of two sides of a triangle is parallel to the third side.
5. The difference of the squares on two sides of a triangle is equal to twice the rectangle contained by the base and the line intercepted between the middle point of the base and the foot of the perpendicular drawn from the vertical angle to the base.
6. Divide $\frac{3x^5}{4} - 4x^4 + \frac{7.7}{8}x^3 - \frac{4.3}{4}x^2 - \frac{3.3}{4}x + 27$ by $\frac{x^2}{2} - x + 3$.
7. Find the G.C.M. of
$$x^6 - 7x^5 - 3x^4 - 5x^3 + 42x^2 - 34x - 21 \text{ and }$$
$$x^5 - 11x^4 + 25x^3 + 19x^2 - 49x - 21.$$
8. Solve $\dfrac{mx + a + b}{nx - c - d} = \dfrac{mx + a + c}{nx - b - d}$
9. There is a number consisting of two digits, which, if divided by the sum of its digits, the quotient is 4; but if 27 be added to the number the digits will be reversed. Find the number.
10. Find how many gallons of water can be held in a leathern hose 2 inches in bore and 40 feet long. (Two decimal places.)

11. A river 30 feet deep and 200 yards wide is flowing at the rate of 4 miles an hour: find how many tons of water run into the sea per minute.
12. The walls of a room 21 feet long, 15 feet 9 inches wide, and 11 feet 8 inches high are painted at the expense of £9 12s. 6d. Find the additional cost of painting the ceiling at the same rate.

Mathematics (Males).

"A." CERTIFICATE.

The usual abbreviations may be used.
Three hours allowed.

1. To inscribe a regular pentagon in a given circle.
2. If four magnitudes of the same kind are proportionals, they are also proportionals when taken alternately.
3. To find a mean proportional between two given straight lines.
4. Construct a triangle having given the base, the difference of the angles at the base, and the difference of the remaining sides.
5. Divide a given straight line into two parts such that the square on one of them may be double the square on the other.
6. To describe a circle to touch a given circle, and also to touch a given straight line at a given point.
7. Solve $23 x^2 - 75x - 6x \sqrt{4x^2 - 9x + 9} + 40 = 0.$
8. In how many different ways can a person pay £100 with sovereigns and half-guineas?
9. Transform 713·44 in the scale eight to the scale six.
10. Determine the values of the trigonometrical ratios for an angle of 45°.
11. The sides of a triangle are 3, 5, 7 inches respectively: find the angle contained by the two smaller sides, and the area of the triangle.
12. If $b = 65$, $c = 55$, $A = 63°$. Find B and C.

Having given $\angle$ cot. 31° 30′ = 10·2126807
log. 2 = ·3010300
log. 3 = ·4771213
$\angle$ tan. 7° 44′ = 9·1328926.
$\angle$ tan. 7° 45′ = 9·1338391.

Physiography.

"A." CERTIFICATE.

Two hours allowed.

The candidate may attempt any *seven* questions.

1. State what you know about the Gulf Stream, its origin, and effect upon climate.
2. Give an account of recent researches in connection with the origin of dew.
3. The atmosphere is at least 200 miles in height, and when we ascend to the height of $3\frac{1}{2}$ miles the mercury in the barometer falls to half its height. Explain the reason of this.
4. State the methods used in determining the density of the Earth.
5. Explain the conditions which give rise to: (*a.*) abundant rainfall; (*b.*) great drought.
6. What are isotherms? What are the data required for drawing them upon a globe?
7. Describe the various forms of nebulæ.
8. What is meant by the Solar system? Name the celestial bodies which constitute it.

Music.

"A." AND "B." CERTIFICATES.

"B." Candidates may take questions 1 to 8, inclusive.

"A." „ „ „ 5 to 12 „

Staff Notation.
SECTION I.—"B." ONLY.

1. What is meant by syncopation? Give example in common and ⁶⁄₈ time.

2. Write a melody of six bars in the key of D, exhibiting a modulation into the relative minor and a return to the original key.

3. What is the relative value of a crotchet with a double dot and a semiquaver? Write the notes and their corresponding rests.

4. Write out on the stave the Chromatic scale of E flat, ascending and descending. Under each note place its sol-fa name.

SECTION II.—"B." AND "A."

5. Define the following, and write the respective signs by which they are distinguished:—pause, slur, clef, staccato, triplet, dal segno, sforzando, double sharp, bar, appogiatura.

6. Give a list, with meanings, of the principal terms used to indicate pace.

7. Make out a table of key signatures for the major and minor keys.

8. Write the scales, ascending and descending, of A flat major and its relative minor.

SECTION III.—"A." ONLY.

9. (*a.*) What means have we of determining the exact duration of notes?

(*b.*) Explain crotchet = 88, quaver = 108, minim = 60.

10. Define melody, harmony, plagal cadence, discord by suspension, inversion.

11. What consecutive intervals are forbidden in harmonic progression, and why?

12. What is meant by the dominant seventh? Why must it be resolved? What is its principal resolution?

TONIC SOL-FA.

Candidates for—
"B." Certificate may take questions 1 to 8, inclusive.
"A." „ „ „ „ 5 to 12, „

1. What are the syllabic names, manual signs, and mental effects of the key tone, and the 3rd and 5th tones above the key tone? From what two causes arise the different effects of these three tones?

2. What is a pulse? How do you mark and name a two and a three pulse tone?

3. What are the two principal chords? How are they named, and what do you know of the relationship between them?

4. What is an accent? Name the different kinds, and write the signs by which in Tonic Sol-fa notation they are designated.

5. Under the following measures write the time names:—
| d : m. d | d : m, r. d, r | m. d : d | r, d. m, r : d | d : m, s |
| d' : s. m | s. m : s. m | d :—||

6. Describe the resolution of S into D.

7. What do you mean by transition? Name and give examples of the two most common transitions.

8. Write out the melody of the first three lines of "God Save the Queen," explaining the rhythm.

9. Write out the scale of the modern minor? What alternative tones are introduced, and why?

10. Draw up a Tonic Sol-fa Time Chart.

11. Define portamento, swell, resonance, staccato, stretto, shake, appogiatura, chromatic, syncopation, Da Capo.

12. What do you mean by phrasing? What are the chief things to be borne in mind in determining the correct phrasing of a school song?

Latin.

"B." CERTIFICATE.

Three hours allowed.

1. Translate and parse all words in italics in the following passages:—
    (*a.*) Ch. 17, whole.
    (*b.*) Ch. 42, § 4, to end.
    (*c.*) Ch. 50, § 2, Tum demum to end.

2. Write a short account of Cæsar's life.

3. Give the genitive, plural and singular, of the following words:—
    Gener, eques, homo, turris, grus, mulier, specus, species, acer, nemo, neuter.

4. Give the Latin numerals—cardinal, ordinal, distributive, and adverbial—for the following numbers:—2, 4, 6, 12, 22, 100.

5. Give the imperfect and pluperfect subjunctive of possum, do, fero, eo.

6. Explain, and give examples of, the following constructions:—
    Ablative absolute, indirect question, partitive genitive.

"A." CERTIFICATE.

1. Translate—
    (*a.*) Horace, Odes I., 11.
    (*b.*) „ „ 32,
    And parse fully all words underlined.

2. Translate and Explain—
    (*a.*)   Me tabula sacer
        Votiva paries indicat uvida
        Suspendisse potenti
        Vestimenta maris deo.

    (*b.*) Me quoque devexi rapidus comes Orionis
        Illyricis Notus obruit undis.

    (*c.*) Parcus deorum cultor et infrequens
        Insanientis dum sapientiæ
        Consultus erro.

3. Translate—
    (*a.*) Livy, Bk. XXII., ch. 10, § 1-4 incl.
    (*b.*) „ „ „ 49, § 6-11 incl.,
    And parse fully all words underlined.

4. Write a short description of the battle of Cannæ.

5. State the rules for conditional sentences, and give examples of four different forms of condition.

6. State the rules for (1) Prohibitions; and (2) Direct Questions.

7. Put into Latin—
    1. I wish you would explain to me his manner of life in boyhood: I know pretty well the kind of man he is now.
    2. I blush at having persuaded you to abandon this noble undertaking.
    3. Twice two must needs be four; it does not follow that we must all consult always our own interest.
    4. All this he did at the instigation of your brother, without either receiving or hoping for any reward.

French.

CLASS A.

Three hours allowed.

1. Give a brief sketch of the plot of "Les Femmes Savantes."

2. Translate:
    (*a.*) Le *moindre* solécisme en parlant vous irrite,
        Mais vous en faites, vous, d'étranges en conduite.
        Vos livres éternels ne me contentent pas;
        Et, hors un gros Plutarque à mettre mes *rabats*,
        Vous *devriez* brûler tout ce meuble inutile,
        Et laisser la science aux docteurs de la ville;
        M'ôter, pour faire bien, du grenier de *céans*,
        Cette longue lunette à faire peur aux gens,
        Et cent brimborions *dont* l'aspect importune.

(b.) Que *font*-ils pour l'état, vos habiles héros?
Qu'est ce que leurs écrits lui rendent de service;
Pour accuser la cour d'une horrible injustice,
Et se plaindre en tous lieux que sur leurs doctes noms
Elle manque à verser la faveur de ses dons?
Leur *savoir* à la France est beaucoup nécessaire!
Et des livres qu'ils font la cour a bien affaire.

3. Parse the italic words in above passages, and explain allusions where necessary. In cases of verbs give the five principal parts.

4. Give the present and past participle, and present, preterite, and first future of

tenir, pouvoir, couvrir, mentir, boire, valoir, asseoir, savoir, courir, peindre, faillir, maudire,

and conjugate the present indic. and subj. of

tenir, asseoir, pouvoir, valoir.

5. Give the principal rules for determining the gender of nouns in French by their terminations, giving in each case one example, and, if possible, one exception.

6. Distinguish between the use of
ce, celui, celui-ci, qui, que, en,
and give instances to explain.

7. Give the general rules for the agreement of the past participle with short sentences to illustrate your statements.

8. Translate into French, being careful about accents:—

(a.) I want some lace, made of the finest thread possible.

(b.) Have you some? Give me some more.

(c.) I only want half-a-yard.

(d.) Many a time have I said that.

(e.) Do not give me any.

(f.) How pleasant it is to be at home in the chimney corner. Mother is sewing in the armchair, father is reading his newspaper after the honest work of the day is done; and sister is learning her lessons for to-morrow, for she goes to school regularly. The cat is asleep near the hearth, and there is only heard the tick (Fr. tic-tac) of the old clock, which seems to say, "Make good use of your time, and love one another always."

9. Distinguish between

un couple and une couple	un tour and une tour
„ livre „ livre	„ pendule „ pendule
„ manche „ manche	„ voile „ voile.
„ page „ page	

10. Give the plural of

coffre-fort	cure-dents
chou-fleur	chef-lieu
timbre-poste	chef-d'œuvre
casse-tête	beau-frère.

SCIENCE.

Physiography.

"B." CERTIFICATE.

Two hours allowed.

1. What are metamorphic rocks? Give three examples, and describe two of them.

2. What do you understand by the terms solution, suspension, crystallisation, cohesion, and chemical affinity?

3. What are icebergs? Explain their origin, and name the parts of the ocean where they are to be met with. Explain the terms, icefloes, pack ice, and ice field.

4. Explain concisely how the air is heated. What does the temperature of the air depend upon? What are isothermal lines?

5. What is silica? What name is given to silica in its crystallised form? With what substances is silica found combined in the earth's crust?

6. Describe the appearance of the phenomena known as Auroras. How are they accounted for?

7. Describe the apparent annual motion of the stars due to the earth's rotation round the sun.

Physiology.

"A." AND "B." CERTIFICATES.

A. Time allowed: One and a half hours.—Questions 5 to 10, inclusive.
B. Time allowed: Two hours.—Questions 1 to 8, inclusive.

1. What are the most important points in the evidence that the blood circulates in man?

2. Describe the machinery of respiration.

3. What do you know of the liver—its structure, connections, and functions?

4. Give an account of the teeth of an adult man.

5. Explain the position and functions of the larynx.

6. "The excitability of the retina is readily exhausted." From this explain the appearance of complementary colours.

7. What do you know of afferent and efferent nerves?

8. Describe the structure of a hair.

9. Give numerical particulars of the vitiation of pure air in respiration.

10. What are the four great divisions of food stuffs? Give examples.

Physics.

"A." AND "B." CERTIFICATES.

A. Time allowed: One and a half hours.—Questions 5 to 10, inclusive.
B. Time allowed: Two hours.—Questions 1 to 8, inclusive.

1. Explain the principle of the parallelogram of forces.

2. What are the three laws of motion?

3. Define *cohesion, adhesion, chemical affinity*. Give examples of each.

4. Explain Pascal's law of the equality of pressure of liquids in all directions. What machines illustrate this law?

5. What is the doctrine of the conservation of energy? How does a system of pulleys exemplify this?

6. Describe a thermometer. What are the modes of graduation in the Fahrenheit, Centigrade, and Réaumur scales?

7. Explain the principle of the simple microscope.

8. Define the following units in electrical calculations:—*Ohm, Volt, Ampére.*

9. Explain the formation of images in a plane mirror.

10. What do you know of the structure of crystals?

Inorganic Chemistry.

"A." CERTIFICATE.

Six questions may be attempted.

Time allowed for this paper: One and a half hours.

1. Name the properties of chlorine, and state one method of preparing it.

2. What do you understand by the density of a gas? "The volume of a given weight of a gas has to be calculated at the standard temperature and pressure." What does this mean?

3. How could you obtain nitrogen from (1) ammonia, (2) nitrous oxide, and (3) air?

4. Explain, as fully as you can, why air is said to be a mixture of two elements, and hydrochloric acid a chemical combination.

5. Explain in words what is implied in the following equations:—

(a.) $Zn + H_2 SO_4 = Zn SO_4 + H_2$

(b.) $Ca CO_3 = Ca O + CO_2$

(c.) $2N H_4 Cl + Ca O = 2N H_3 + H_2 O + Ca Cl_2$

6. By what tests could you prove that a substance which was stated to be sulphur actually was that element?

7. A lighted taper burns brilliantly when plunged into a jar of gas. What gases are capable of producing such effect, and how would you determine what gas was present in any particular case?

Geology.

"A." AND "B." CERTIFICATES.

A. Time allowed : One and a half hours.—Questions 5 to 10 inclusive·
B. Time allowed : Two hours.—Questions 1 to 8 inclusive.

1. Explain the action of rain as a disintegrating force on rocks.
2. Give a description of quartz.
3. Define the word fossils as used in modern geology. Why are fossils of such importance ?
4. Give the five main divisions of the Geological Record, with some particulars of each.
5. "Coal is composed of compressed and mineralized vegetation." How do you account for its great depth ?
6. What traces of vanished glaciers may be found in Western Europe ?
7. What do you know of volcanic products ?
8. Describe the formation of *stalactites* and *stalagmites*.
9. How do you account for the presence of river bars in many estuaries ?
10. Give an account of Neolithic deposits.

Agriculture.

"A." CERTIFICATE.

One and a half hours allowed.

1. Give a classification of soils, illustrating your answer by a diagram.
2. What are the sources of loss to soils ?
3. Explain the action of *guano* and *nitrate of soda* as manures.
4. Describe the functions of the leaves of a plant.
5. Describe the structure of grasses, and give full particulars of the flower.
6. Give the following particulars concerning the seeds of *wheat, barley, oats, lucerne, potatoes.*
    1. Signs of quality.
    2. Weight per bushel.
    3. Quantity sown per acre.
7. What are the advantages of rotation of crops ? What is the Norfolk or four-course system ?
8. What are the natural enemies of insect pests ?
9. Give the periods of gestation of farm stock.
10. Give simple rules for making butter.