

(No. 20.)



1871.

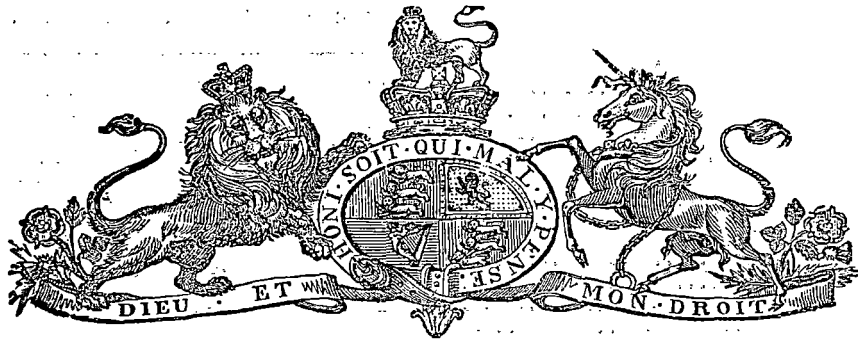
T A S M A N I A.

H O U S E O F A S S E M B L Y.

T A S M A N I A N S C H O L A R S H I P S.

R E P O R T F O R 1871.

Laid upon the Table by the Colonial Treasurer, and ordered by the House to be printed, November 8, 1871.



TASMANIAN COUNCIL OF EDUCATION.

TASMANIAN SCHOLARSHIPS.

THE Council of Education have directed the publication of the name of the under-mentioned Candidate who has passed the Examination for a Tasmanian Scholarship to the satisfaction of the Examiner, and to whom such Scholarship has been awarded accordingly, under "The Tasmanian Council of Education and Scholarship Act," 22 Vict. No. 21:—

JOHN WILLIAM HENRY GEISS, age 18 years and 11 months, Hobart Town, Tasmania, Associate of Arts, 1869, Pupil of the High School, Hobart Town, Rev. R. D. Poulett Harris, M.A.

The Report of the Examiner is annexed.

By Order of the Council,

GEO. RICHARDSON, *Secretary.*

Hobart Town, 18th September, 1871.

EXAMINER'S REPORT.

Monday, 18th September, 1871.

MR. PRESIDENT AND MEMBERS OF THE TASMANIAN COUNCIL OF EDUCATION.

I HAVE the honor to report that three Candidates presented themselves for the Tasmanian Scholarship Examination.

The Examination commenced on Tuesday, the 12th, and continued for five days, with seven hours and a half of paper work daily.

One only of the three Candidates has satisfied the conditions prescribed by the Council, having obtained in all 2164 marks, of which 1122 were gained in Classics.

Another Candidate, whose papers bear the motto "*Arcturus*," is little short of him in number of marks, but has just failed to attain the minimum fixed both in Classics and in Mathematics, having obtained in the former 865 out of 900 required, and in the latter 718 out of the necessary 750.

On opening the envelope bearing the motto "*Hesperus*," the successful Candidate was found to be—

JOHN WILLIAM HENRY GEISS, A.A., 1869.

A full table of the marks obtained in each paper is appended to this Report.

M. H. IRVING, M.A., *Examiner.*

TABLE OF MARKS.

| | VALUE. | <i>Arcturus.</i> | <i>Hesperus.</i> | <i>Lynceus.</i> |
|--|--------|------------------|------------------|-----------------|
| MATHEMATICS. | | | | |
| I. Arithmetic and Algebra | 375 | 140 | 137 | 37 |
| II. Geometry and Trigonometry ... | 375 | 268 | 204 | 153 |
| III. Trigonometry and Conics | 375 | 155 | 86 | — |
| IV. Differential Calculus and Natural Philosophy ... | 375 | 155 | 132 | 0 |
| <i>Total</i> | 1500 | 718 | 559 | 190 |
| CLASSICS. | | | | |
| I. Greek Authors | 300 | 203 | 234 | 184 |
| II. Latin Authors | 300 | 209 | 245 | 218 |
| III. Greek Composition | 200 | 94 | 137 | 115 |
| IV. Latin Composition | 250 | 119 | 167 | 162 |
| V. General Questions | 250 | 133 | 179 | 94 |
| VI. Ancient History | 200 | 107 | 160 | 88 |
| <i>Total</i> | 1500 | 865 | 1122 | 861 |
| MODERN LANGUAGES AND HISTORY. | | | | |
| I. English | 250 | 183 | 171 | 174 |
| II. French | 250 | 134 | 137 | 173 |
| III. Constitutional History | 250 | 186 | 175 | 176 |
| <i>Total</i> | 750 | 503 | 483 | 523 |
| GRAND TOTAL | 3750 | 2086 | 2164 | 1574 |

M. H. IRVING, *M.A.*, *Examiner.***Mathematics.—I.**

Four Hours.

ARITHMETIC AND ALGEBRA.

- If the section of a river bed be a semicircle, and the width at the top half a mile, how many gallons of water pass down it in $3\frac{1}{2}$ hours if the stream runs $2\frac{1}{2}$ miles an hour?
(Take $\pi = \frac{22}{7}$, and the gallon at 275 cubic inches.)
- If the National Debt be 800 millions, find to the nearest foot the side of a cubical block of gold that is of its value, having given that an ounce of gold is worth £3 17s. 10 $\frac{1}{2}$ d., that the specific gravity of gold is 19.5, and that a cubic foot of water weighs 1000 ounces.
- Two guns are fired from a battery at an interval of 21 minutes, and an approaching traveller hears the reports at 20' 14" interval. Find his rate of approach if sound travels 1125 feet per second.
- Find the interest and the true discount on £3754 for 8 months at $7\frac{1}{2}$ per cent. Shew that the difference between the two is the interest on the true discount.
- Simplify—

$$\left\{ \left(\frac{2.375}{3.16} \text{ of } \frac{4\frac{1}{2}}{.0625} \right) \div \left(\frac{8.8}{5\frac{1}{2}} \text{ of } .571428 \right) \right\} - \left\{ \frac{2.8 \text{ of } 2\frac{3}{11}}{1.136} - \left(4\frac{8}{15} \text{ of } \frac{4.4}{1\frac{1}{3}} - 2.8\dot{3} \right) \right\}$$
- The solid content of a sphere varies as the cube of its diameter. Find to two places of decimals the diameter of a sphere formed by melting down two spheres of 6 and 7 inches diameter.
- Find the square root of $7 + 2\sqrt{10}$, and an integral value for $(4 + 3\sqrt{-20})^{\frac{1}{2}} + (4 - 3\sqrt{-20})^{\frac{1}{2}}$.
- Write down the 6th term of $(a^2 - x^2)^{-\frac{1}{2}}$.
- If the sum of n terms of a series in Arithmetical Progression be $4n + n^2$, find the first term and the common difference.
- Prove the Exponential Theorem. Hence deduce a series for e^x . What is e ?

11. Prove that if the difference of the antecedent and the consequent in a ratio be small as compared to either, the ratio of their squares is nearly obtained by doubling this difference.
12. In a series in Harmonical Progression the first term is a and the second b . Calculate 4 more terms of the series.
13. If on the average 9 ships out of 10 return safe to port, find the chance that out of 5 ships expected 3 at least will arrive.
14. Given $\log 4 = .60206$. Find $\log 250$.
15. Solve these Equations—

$$(a) \quad \frac{x+3}{2} + \frac{16-2x}{2x-5} = 5\frac{1}{3}. \quad (b) \quad \frac{x+2}{x-1} - \frac{4-x}{2x} = \frac{7}{3}.$$

$$(c) \quad 2^{x+1} + 4^x = 80. \quad (d) \quad \frac{1+x^3}{(1+x)^3} = a.$$

16. Solve these Equations—

$$(a) \quad \left. \begin{array}{l} x-y = a \\ y^2 + ay + bx = 0 \end{array} \right\} \quad (b) \quad 2y - 3x = 3x^2 + 2(y-11)^2 = 14$$

$$(c) \quad \left. \begin{array}{l} x^3 + y^3 = 18xy \\ x + y = 12 \end{array} \right\} \quad (d) \quad 2x + 3y = 35 \text{ for all positive integral values of } x \text{ and } y.$$

Mathematics.—II.

Three Hours and a half.

EUCLID.

GEOMETRICAL CONICS.

TRIGONOMETRY.

1. If the square described upon one of the sides of a triangle be equal to the squares described upon the other two sides of it, the angle contained by these two sides is a right angle.
2. If from either of the base angles of an isosceles triangle a straight line is drawn perpendicular to the opposite side, the rectangle contained by that side, and the portion of it between the foot of the perpendicular and the base, shall equal half the square on the base.
3. If two circles cut one another the line joining their centres bisects the chord which joins their points of intersection.
4. Describe an isosceles triangle having each angle at the base double of the angle at the vertex.
5. The external angle of a triangle is bisected by a line which meets the base produced. State and prove the resulting proportion.
6. If two straight lines meeting one another be parallel to two others that meet one another and are not in the same plane with the first two: the first two and the other two shall contain equal angles.
7. Define a Parabola. Prove that the curve lies wholly on one side of the directrix.
8. If from a point O there be drawn OQ, OQ' tangents to a parabola at Q and Q' , OSQ, OSQ' shall be similar triangles.
9. Prove that in the Ellipse the sum of the distances of a point from the foci is greater or less than the axis major according as the point is without or within the ellipse.
10. Prove that in the Ellipse the rectangle under the abscissæ of the axis major is to the square of the ordinate as the square of the semi-axis major to the square of the semi-axis minor.
11. Define the Hyperbola. Prove that every Hyperbola has two foci and two directrices.
12. Investigate the distinguishing property of the curve in which the surface of a cone is cut by a plane parallel to a straight line in its surface and perpendicular to the plane containing that line and the axis.

13. For any angle construct a figure and give the Geometrical definition of the cosine and the versed sine.

Express the sine and the tangent in terms of the versed sine.

14. Investigate geometrically a formula for the cosine of the difference of two angles in terms of the sines and the cosines of the angles.
15. Find $\sin 18^\circ$ and prove that $\sin 30^\circ$ is a mean proportional between $\sin 18^\circ$ and $\sin 54^\circ$.
16. Prove that $\tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{7} + \tan^{-1} \frac{1}{8} = 45^\circ$.

Mathematics.—III.

Four Hours.

TRIGONOMETRY AND ANALYTICAL CONICS.

1. Prove that in every triangle $\tan \frac{A - B}{2} = \frac{a - b}{a + b} \cot \frac{C}{2}$.
2. A tower at an unknown distance due east of an observer subtends an angle of $10^\circ 16' 30''$. He then walks due south for one furlong, and finds that the tower bears north-east. Find the height of the tower, and the horizontal distance of its foot from the first point of observation.
3. Calculate a general formula for the area of the polygon of n sides inscribed in a circle. Hence determine the area of a pentagonal field inscribed in a circle of 12 chains radius.
4. If R be the radius of the circle described about a given triangle, prove that $a \cos A + b \cos B + c \cos C = 4 R \sin A \sin B \sin C$.
5. Three circles of radius p, q, r touch one another externally. Prove that the square of the area of the triangle formed by joining their centres $= (p + q + r)(pqr)$.
6. Express $\cos^n \theta$ in terms of cosines of multiples of θ , n being a positive integer; and write down the form of the last term if n be odd.
7. Determine the sum of $\frac{2}{3} + \frac{4}{5} + \frac{6}{7} + \dots$ ad inf.
8. Investigate a general expression for the length of the perpendicular from a given point on a given line.
9. Find the equations to the diagonals of the parallelogram formed by—

$$x + \frac{y}{2} = 1, \quad x + \frac{y}{2} = 2$$

$$\frac{x}{2} + y = 1, \quad \frac{x}{2} + y = 2$$
 and shew that they are at right angles to each other.
10. Find the equation to the circle which passes through the origin and cuts off lengths h and k on the negative axes of x and y .
11. If the origin be on the circumference, and the diameter through that point make an angle α with the initial line, find the polar equation to the circle.
12. What does the Equation $4xy - 3x^2 = a^2$ become if the rectangular axes are turned through an angle $\tan^{-1} 2$; and what does it represent?
13. Find the locus of intersection of tangents to the parabola with the perpendiculars on them from the focus. Explain the double result.
14. What is the Excentricity of an Ellipse? Find it for the Ellipse $2x^2 + 3y^2 = c^2$.
15. Find the equation to the Tangent at any point of the Hyperbola. Prove that the Tangent at the Vertex is parallel to the axis of y .
16. State fully what loci may be represented by the general equation $ax^2 + bxy + cy^2 + dx + ey + f = 0$, and under what conditions.

Mathematics.—IV.

Three Hours and a half.

DIFFERENTIAL CALCULUS AND NATURAL PHILOSOPHY.

1. Find the differential coefficient of $\sqrt{a^2 - x^2}$ and point out its Geometrical application.
2. Differentiate $\frac{1+x}{1+x^2}$, $\left(\frac{1-x^2}{(1+x^2)^3}\right)^{\frac{1}{2}}$, $\tan a^{\frac{1}{x}}$, $\frac{e^x - e^{-x}}{e^x + e^{-x}}$.
3. Differentiate $\sin^{-1} mx$, $\tan^{-1} \frac{2x}{1-x^2}$, $x^{\sin^{-1} x}$, $\frac{(\sin x)^n}{\sin nx}$.
4. If $y = \frac{x^3}{1-x}$, find $\frac{d^4y}{dx^4}$; and prove that if $y = e^{-x} \cos x$, $\frac{d^4y}{dx^4} + 4y = 0$.
5. $ABCD$ is a square: a force of 1 lb. acts along AD , another of 2 lbs. along AB , and a third of 3 lbs. along CB . Find the magnitude and the direction of the resultant.
6. A uniform bar of iron 12 feet long, weighing 4 cwt., has one end resting on a ledge, and is supported in a horizontal position by a rope fastened to its other end and to a hook 16 feet vertically above the ledge; and a weight of 12 cwt. hangs from the bar at 8 feet from the ledge. Find the tension on the rope.
7. Explain the construction of the Balance. Specify the main requisites of a good balance, and state the modes of attaining them. What is the practical inconvenience of great sensibility, and how is it obviated?
8. If a uniform heavy bar of iron 14 feet long is bent to a right angle at 8 feet from one end, find the distance of the new centre of gravity from the original one.
9. Investigate a formula for the centre of gravity of any number of bodies in the same plane.
10. The height of a rough inclined plane is to its length as 3 to 5, and a weight of 10 lbs. is just supported upon it by friction alone. Find the smallest power which exercised along the plane will draw the weight up.
11. If V be the velocity at any time T of a body moving with a uniform acceleration f , then the space described in the interval between T and $T+t = Vt + \frac{1}{2}ft^2$.
12. An arrow shot vertically upwards returned in 10". Find initial velocity and height attained, having given $g = 32 \cdot 2$.
13. If an imperfectly elastic ball falls from a given height on a given inclined plane, find the latus rectum of the parabola which it will describe after impact.
14. If a cylinder 6 feet deep be filled with water, find its diameter, having given that the pressure on the base is equal to that on the curved portion.
15. The apparent weight of a body resulting from an experiment made in common air is always deceitful. Why? and with what exception? Calculate a general formula for the correction of the error.
16. Neglecting the earth's attraction and the change of temperature in ascending, calculate a formula for finding the difference of altitude between two stations above the surface of the earth by means of barometer readings.

Ex.: At the Supreme Court, Hobart Town, the barometer indicates 30.095 inches: at the Springs 27.375. Find the difference of altitude.

Classics.—I.

Three Hours.

GREEK AUTHORS.

HERODOTUS—Book IV. THUCYDIDES—Book I. HOMER—Iliad, Book VII. SOPHOCLES—Antigone.

1. Translate—

(a) Νευροὶ δὲ νόμοισι μὲν χρέωνται Σκυθικοῖσι· γενεῇ δὲ μῆ πρότερόν σφεας τῆς Δαρείου στρατηλασίας κατέλαβε ἐκλιπεῖν τὴν χώραν πᾶσαν ὑπὸ ὀφίων. ὄφιας γάρ σφι πολλοὺς μὲν ἢ χώρα ἀνέφαινε, οἱ δὲ πλεῦνες ἀνωθέν σφι ἐκ τῶν ἐρήμων ἐπέπεσον· ἐς δ, πιεζόμενοι, οἴκησαν μετὰ Βουδίνων, τὴν ἑωυτῶν ἐκλιπόντες. κινδυνεύουσι δὲ οἱ ἄνθρωποι οὔτοι γόητες εἶναι· λέγονται γὰρ ὑπὸ Σκυθῶν καὶ Ἑλλήνων τῶν ἐν τῇ Σκυθικῇ κατοικημένων, ὡς ἔτεος ἐκάστου ἀπαξ τῶν Νευρῶν ἕκαστος λύκος γίνεται ἡμέρας ὀλίγας, καὶ αὐτὶς ὀπίσω ἐς τὰυτὰ κατίσταται· ἐμὲ μὲν νυν ταῦτα λέγοντες οὐ πείθουσι· λέγουσι δὲ οὐδὲν ἦσσαν, καὶ ὁμνύουσι δὲ λέγοντες· Ἄνδροφάγοι δὲ ἀγριώτατα πάντων ἀνθρώπων ἔχουσι ἡθεα· οὔτε δίκην νομίζοντες, οὔτε νόμῳ οὐδενὶ χρεώμενοι. νομάδες δὲ εἰσι· ἐσθῆτα δὲ φορέουσι τῇ Σκυθικῇ ὁμοίην· γλώσσαν δὲ ἰδίην· ἀνθρωποφαγέουσι δὲ μόνουι τούτων. Μεγάγχλαινοι δὲ εἴματα μὲν μέλανα φορέουσι πάντες, ἐπ' ὧν καὶ τὰς ἐπωυνμίας ἔχουσι· νόμοισι δὲ Σκυθικοῖσι χρέωνται. Βουδῖνοι δὲ, ἔθνος ἐὼν μέγα καὶ πολλόν, γλαυκόν τε πᾶν ἰσχυρῶς ἐστὶ καὶ πυρρόν.

(b) καὶ τὸ βραδὸν καὶ μέλλον, ὃ μέμφονται μάλιστα ἡμῶν, μὴ αἰσχύνησθε. σπεύδοντες τε γὰρ σχολαίτερον ἂν παύσαισθε διὰ τὸ ἀπαράσκευοι ἐγχειρεῖν· καὶ ἅμα ἐλευθέραν καὶ εὐδοξοτάτην πόλιν διὰ παντὸς νεμόμεθα, καὶ δύναται μάλιστα σωφροσύνη ἔμφρων τούτ' εἶναι. μόνουι γὰρ δὲ αὐτὸ εὐπραγίας τε οὐκ ἐξυβρίζομεν καὶ ζυμφοραῖς ἦσσαν ἐτέρων εἴκομεν· τῶν τε ζῆν ἐπαίνῳ ἐξοτρυνόντων ἡμᾶς ἐπὶ τὰ δεινὰ παρὰ τὸ δοκοῦν ἡμῖν οὐκ ἐπαιρόμεθα ἠδονῆ, καὶ ἦν τις ἄρα ζῆν κατηγορίᾳ παροξύνῃ, οὐδὲν μᾶλλον ἀχθεσθέντες ἀνεπέσθημεν. πολεμικοὶ τε καὶ εὐβουλοὶ διὰ τὸ εὐκοσμον γιγνώμεθα, τὸ μὲν ὅτι αἰδῶς σωφροσύνης πλείστον μετέχει, αἰσχύνης δὲ ἐνψυχία, εὐβουλοὶ δὲ ἀμαθέστερον τῶν νόμων τῆς ὑπεροψίας παιδευόμενοι, καὶ ζῆν χαλεπότητι σωφρονέστερον ἢ ὥστε αὐτῶν ἀνηκουστέων, καὶ μὴ τὰ ἀχρεῖα ζυνετοὶ ἄγαν ὄντες, τὰς τῶν πολεμίων παρασκευὰς λόγῳ καλῶς μεμφόμενοι ἀνομοίως ἔργῳ ἐπεξίεναι, νομίζειν δὲ τὰς τε διανοίας τῶν πέλας παραπλησίους εἶναι καὶ τὰς προσπιπτούσας τύχας οὐ λόγῳ διαρετάς. αἰεὶ δὲ ὡς πρὸς εὐβουλεομένους τοὺς ἐναντίους ἔργῳ παρασκέναζώμεθα· καὶ οὐκ ἐξ ἐκείνων ὡς ἀμαρτησομένων ἔχειν δεῖ τὰς ἐλπίδας, ἀλλ' ὡς ἡμῶν αὐτῶν ἀσφαλῶς προνοουμένων. πολὺ τε διαφέρειν οὐ δεῖ νομίζειν ἀνθρώπου ἀνθρώπου, κράτιστον δὲ εἶναι ὅστις ἐν τοῖς ἀναγκαιοτάτοις παιδεύεται.

(c) Ἄτρείδη τε καὶ ἄλλοι ἀριστῆες Παναχαιῶν,
Ἡνώγει Πρίαμός τε καὶ ἄλλοι Τρῶες ἀγανοὶ
εἰπεῖν, αἰ κέ περ ἕμμι φίλον καὶ ἠδὺ γένοιτο,
Μῦθον Ἄλεξάνδροιο, τοῦ εἵνεκα νεῖκος ὄρωρεν.
Κτήματα μὲν ὅσ' Ἄλεξάνδρος κοίλῃς ἐνὶ νηυσὶν
Ἡγάγετο Τροίηνδ'—ὡς πρὶν ὠφέλλ' ἀπολέσθαι—,
Πάντ' ἐθέλει δόμεναι, καὶ ἔτ' οἴκοθεν ἄλλ' ἐπιθέιναι
Κουριδίην δ' ἄλοχον Μενελάου κυδαλίμοιο
Ὁὐ φησὶν δώσειν· ἢ μὴν Τρῳῆς γε κέλονται.
Καὶ δὲ τόδ' ἠνώγειν εἰπεῖν ἔπος, αἰ κ' ἐθέλητε
Παύσασθαι πολέμοιο δυσηχέος, εἰς δ' κε νεκροὺς
Κήομεν· ὕστερον αὐτε μαχασόμεθ', εἰς δ' κε δαίμων
Ἄμμε διακρίνη, δῶν δ' ἐτέροισί γε νίκην.

(d) ὁ δ' ὡς ὀρᾷ σφε, στυγνὸν οἰμώξας ἔσω
χωρεῖ πρὸς αὐτὸν κἀνακωκύσας καλεῖ,
ὦ τλήμων, οἶον ἔργον εἰργασαί· τίνα
νοῦν ἔσχεσ; ἐν τῷ ζυμφορᾶς διεφθάρης;
ἔξελθε, τέκνον, ἰκέσιός σε λίσσομαι.
τὸν δ' ἀγρίοις ὄσσοισι παπτήνας ὁ παῖς,
πτύσας προσώπῳ κούδεν ἀντειπῶν ξίφους
ἔλκει διπλοῦς κνώδοντας· ἐκ δ' ὄρμωμένου
πατρὸς φυγαῖσιν ἤμπλακ'· εἴθ' ὁ δύσμορος
αὐτῷ χολωθεῖς, ὡσπερ εἶχ', ἐπενταθεῖς
ἠρεισε πλευραῖς μέσσον ἔγχος, ἐς δ' ὕγρον
ἀγκῶν' ἔτ' ἔμφρων παρθένῳ προσπτύσσεται
καὶ φυσιῶν ὀξεῖαν ἐκβάλλει πνοήν
λευκῇ παρειᾷ φοινίου σταλάγματος.
κεῖται δὲ νεκρὸς περὶ νεκρῶν, τὰ νυμφικὰ
τέλη λαχὼν δαίλαιος εἶν' Αἰδου δόμοις,
δείξας ἐν ἀνθρώποισι τὴν ἀβουλίαν
ὅσω μέγιστον ἀνδρὶ πρόσκειται κακόν.

2. Translate, explain, and refer to the context—

- (a) ἐπάψας ἄμματα ἐξήκοντα ἐν ἱμάντι.
 (b) ἐν δὲ ταύτῃ ἐνύδριες ἀλίσκονται καὶ κάστορες καὶ ἄλλα θηρία τετραγωνοπρόσωπα.
 (c) οἰκήματα δὲ σύμπηκτα ἐξ ἀνθερίκων ἐνεργμένων περὶ σχοίνους ἐστὶ, καὶ ταῦτα περιφόρητα.
 (d) τῆς δὲ τροπῆς γενομένης τὰ σκάφη μὲν οὐκ εἴλκον τῶν νεῶν ἅς καταδύσειαν, πρὸς δὲ τοὺς ἀνθρώπους ἐτράποντο.
 (e) ἤλασε δὲ τοὺς ἐναγείς Κλεομένης μετὰ Ἀθηναίων στασιαζόντων.
 (f) ἀλλ' ὑμεῖς μὲν πάντες ὕδωρ καὶ γαῖα γένοισθε ἡμενοὶ αὐθι ἕκαστοι ἀκήριοι, ἀκλεῆς αὐτως.
 (g) ἐγὼ δ' ὅπως σὺ μὴ λέγεις ὀρθῶς τάδε οὐτ' ἂν δυνάϊμην, μητ' ἐπισταίμην λέγειν.
 (h) ἴν' ἀγχίπολις Ἄρης δισσοῖσι Φινείδαις εἶδεν ἀρατὸν ἔλκος ἀραχθὲν ἐξ ἀγρίας δάμαρτος ἀλαδὸν ἀλαστόροισιν ὀμμάτων κύκλοις ἄτερθ' ἐγχείων, ὕφ' αἱματηραῖς χείρεσσι καὶ κερκίδων ἀκμαῖσιν.

3. Derive fully and give the meaning of ἀμαλδύνεσθαι, ἀνακωχή, δικτυόκλωστος, διῶρυξ, θηριώδης, ἱππηλάτα, ὀρμίζω, πύματος.
 4. Write notes on Εἰλῶται, ἐνδέξια, ἤλεκτρον, Ἰθωμήτης, κουριδίη, Μοῖραι, Οἰορπάτα, φερέοικοι.
 5. Give a brief account of Danae, Inaros, Laomedon, Minos, Pausanias, Tantalus, Theras, Zalmoxis.
 6. What and where are Epidamnus, Hæmus, Jardanus, Memphis, Pallene, Sipylus, Salmydessus, Tartessus.

Classics.—II.

Three Hours.

LATIN AUTHORS.

CICERO—De Amicitia. LIVY—Book XXII. VIRGIL—Third Georgic. HORACE—Odes.

I. Translate—

(a) Quum autem contrahat amicitiam, ut supra dixi, si qua significatio virtutis eluceat, ad quam se similis animus applicet et adjungat: id quum contingit, amor exoriatur necesse est. Quid enim tam absurdum, quam delectari multis inanibus rebus, ut honore, ut gloria, ut ædificio, ut vestitu cultuque corporis; animo autem virtute prædito, eo, qui vel amare, vel, ut ita dicam, redamare possit, non admodum delectari? Nihil est enim remuneratione benevolentia; nihil vicissitudine studiorum officiorumque jucundius. Quod si etiam illud addimus, quod recte addi potest, nihil esse, quod ad se rem ullam tam alliciat et tam attrahat, quam ad amicitiam similitudo; concedetur profecto verum esse, ut bonos boni diligant, adsciscantque sibi quasi propinquitate conjunctos atque natura. Nihil est enim appetentius similitudinis sui, nihil rapacius, quam natura.

(b) Minucius vero cum jam ante vix tolerabilis fuisset secundis rebus ac favore vulgi, tum utique immodice immodesteque non Hannibale magis victo ab se quam Q. Fabio gloriari. Illum in rebus asperis unicum ducem ac parem quæsitum Hannibali, majorem minori, dictatorem magistro equitum, quod nulla memoria habeat annalium, jussu populi æquatam, in eadem civitate, in qua magistri equitum virgas ac secures dictatoris tremere atque horrere soliti sint: tantum suam felicitatem virtutemque enituisse. Ergo secuturum se fortunam suam, si dictator in cunctatione ac segnitie deorum hominumque judicio damnata perstaret. Itaque quo die primum congressus est cum Q. Fabio, statuendum omnium primum ait esse, quemadmodum imperio æquato utantur. Se optimum ducere aut diebus alternis, aut si majora intervalla placerent, partitis temporibus alterius summum jus imperiumque esse, ut par hosti non solum consilio sed viribus etiam esset, si quam occasionem rei gerendæ habuisset. Q. Fabio haudquaquam id placere: omnia enim fortunam habituram, quæcunque temeritas collegæ habuisset. Sibi communicatum cum illo,

non ademptum imperium esse. Itaque se nunquam volentem parte qua posset rerum consilio gerendarum cessurum; nec se tempora aut dies imperii cum eo, exercitum divisurum, suisque consiliis, quoniam omnia non liceret, quæ posset servaturum.

(c) Nunc, veneranda Pales, magno nunc ore sonandum.
 Incipiens stabulis edico in mollibus herbam
 Carpere oves, dum mox frondosa reducitur æstas;
 Et multa duram stipula filicumque manipulis
 Sternere subter humum, glaciesne frigida lædat
 Molle pecus, scabiemque ferat turpesque podagras.
 Post hinc digressus jubeo frondentia capris
 Arbuta sufficere, et fluvios præbere recentes:
 Et stabula a ventis hiberno opponere soli
 Ad medium conversa diem, quum frigidus olim
 Jam cadit extremoque irrorat Aquarius anno.
 Hæ quoque non cura nobis levioere tuendæ;
 Nec minor usus erit; quamvis Milesia magno
 Vellera mutantur Tyrios incocta rubores.
 Densior hinc suboles, hinc largi copia lactis:
 Quam magis exhausto spumaverit ubere mulctra,
 Læta magis pressis manabunt flumina mammis.

(d) Exegi monumentum ære perennius
 Regalique situ pyramidum altius;
 Quod non imber edax, non Aquilo impotens
 Possit diruere, aut innumerabilis
 Annorum series et fuga temporum.
 Non omnis moriar, multa que pars mei
 Vitabit Libitinam: usque ego postera
 Crescam laude recens, dum Capitolium
 Scandet cum tacita Virgine pontifex.
 Dicar, qua violens obstrepit Aufidus
 Et qua pauper aquæ Daunus agrestium
 Regnavit populorum, ex humili potens
 Princeps Æolium carmen ad Italos
 Deduxisse modos. Sume superbiam
 Quæsitam meritis, et mihi Delphica
 Lauro cinge volens, Melpomene, comam.

Or, (e) Adduxere sitim tempora, Virgili:
 Sed pressum Calibus ducere Liberum
 Si gestis, juvenum nobilium cliens,
 Nardo vina merebere.
 Nardi parvus onyx eliciet cadum,
 Qui nunc Sulpiciis accubat horreis,
 Spes donare novas largus amaraque
 Curarum eluere efficax.
 Ad quæ si properas gaudia, cum tua
 Velox merce veni: non ego te meis
 Immunem meditor tingere poculis,
 Plena dives ut in domo.
 Verum pone moras et studium lucri;
 Nigrorumque memor, dum licet, ignium
 Misce stultitiam consiliis brevem:
 Dulce est desipere in loco.

2. Translate, explain, and refer to the context—

(a) Hoc quidem est nimis exigue et exiliter ad calculos vocare amicitiam.

(b) Hodie me ante omnes comicos stultos senes
 Versaris atque emunxeris lautissime.

(c) Quin imo Arretii ante mœnia sedeamus; hic enim patria et penates sunt.

(d) Vix dum omnes conscenderant, quum alii resolutis oris in ancoras evehuntur; alii ne quid teneat ancoralia incidunt.

(e) _____ uris
 Imparibus ductos alta ad donaria currus.

(f) Hic vel ad Elei metas et maxima campi
 Sudabit spatia, et spumas aget ore cruentas,
 Belgica vel molli melius feret esseda collo.

(g) Clavos trabales et cuneos manu
 Gestans aena nec severus
 Uncus abest liquidumque plumbum.

(h) Devota non exstinxit arbos
 Nec Sicula Palinurus unda.

3. Derive fully and give the meaning of callidus, chelydrus, immolare, lupata, naufragium, parasitus, paullum, phaselus.

4. Write brief notes on—Cea nenia, Capitale odium, comitium, Cynthius, Dryades, institor, Milites Gloriosi, Pyrrhæ seculum.

5. Give a brief account of Bias, Drusus, Fabius Pictor, Ixion, Jugurtha, Pacuvius, Tisiphone, Tithonus.

6. What and where are Aufidus, Cercina, Cortona, Cumæ, Epidaurus, Niphates, Tanais, Vultur?

Classics.—III.

Two Hours and a half.

GREEK COMPOSITION.

1. Translate into Greek Iambics—

There never breathed a man who when his life
Was closing, might not of that life relate
Toils long and hard. The warrior will report
Of wounds and bright swords flashing in the field,
And blasts of trumpets. He, who hath been doomed
To bow his forehead in the courts of kings,
Will tell of fraud and never-ceasing hate,
Envy, and heart-disquietude, derived
From intricate cabals of treacherous friends.
I, who on shipboard lived from earliest youth,
Could represent the countenance horrible
Of the vexed waters, and the indignant rage
Of Auster and Boötes.

2. Translate into Greek Prose—

Polybius, reprehending Timæus for his partiality against Agathocles, whom he himself allows to be the most cruel and impious of all tyrants, says : If he took refuge in Syracuse, as asserted by that historian, flying the dirt and smoke and toil of his former profession of a porter ; and if proceeding from such slender beginnings, he became master in a little time of all Sicily ; brought the Carthaginian state into the utmost danger ; and at last died in old age, and in possession of kingly dignity : must he not be allowed something prodigious and extraordinary, and to have possessed great talents and capacity for business and action ? His historian, therefore, ought not to have alone related what tended to his reproach and infamy ; but also what might redound to his praise and honor.

3. Translate—

Charon.—Ἀλλὰ μεταξύ λόγων, τίνες εἰσὶν οἱ πολεμοῦντες ἐκεῖνοι, ἢ ὑπὲρ τίνος ἀλλήλους φονεύουσιν ;

Hermes.—Ἀργείους ὄρας, ὦ Χάρων καὶ Λακεδαιμονίους καὶ τὸν ἡμιθνήτα ἐκεῖνον στρατηγὸν Ὀθρυάδην, τὸν ἐπιγράφοντα τὸ τρόπαιον τῷ αὐτοῦ αἵματι.

Charon.—Ὑπὲρ τίνος δε αὐτοῖς, ὦ Ἑρμῆ, ὁ πόλεμος ;

Hermes.—Ὑπὲρ τοῦ πεδίου αὐτοῦ ἐν ᾧ μάχονται.

Charon.—Ὡ τῆς ἀνοίας, οἷγε οὐκ ἴσασιν, ὅτι κὰν ὅλην τὴν Πελοπόννησον ἕκαστος αὐτῶν κτήσωνται μόγις ἂν ποδιαῖον λάβοιεν τόπον παρὰ τοῦ Αἰακοῦ· τὸ δὲ πεδῖον τοῦτο ἄλλοτε ἄλλοι γεωργήσουσι, πολλάκις ἐκ βόθρων τὸ τρόπαιον ἀνασπάσαντες τῷ ἀρότρῳ.

Hermes.—Οὕτω μὲν ταῦτα ἔσται, ἡμεῖς δε καταβάντες ἤδη καὶ κατὰ χώραν εὐθετήσαντες αὐθις τὰ ὄρη ἀπαλλαττώμεθα ἐγὼ μὲν καθ' ἃ ἐστάλην, σὺ δ' ἐπὶ τὸ πορθμεῖον· ἤξω δὲ σοὶ μετ' ὀλίγον καὶ αὐτὸς νεκροστολῶν.—LUCIAN.

Classics.—IV.

Two Hours and a half.

LATIN COMPOSITION.

1. Translate into Latin Verse—

PYRAMUS AND THISBE.

She saw her wimple and his empty sheath,
And eke the sword that him had done to death,
Then spake she thus : My woeful hand, quoth she,
Is strong enough in such a work for me ;
For love will give me strength and hardiness
To make my wound full large enough, I guess.
I will thee follow dead, and I will be
Partaker of the death I caused, quoth she.
And although nothing but thy death could ever
Have force enough thyself and me to sever,
Thou shalt no more be parted now from me
Than from thy death, for I will follow thee !

2. Translate into Latin Prose—

Nations as well as men arrive at maturity by degrees, and the events which happened during their infancy or early youth cannot be recollected, and deserve not to be remembered. The gross ignorance which anciently covered all the north of Europe, the continual migrations of its inhabitants, and the frequent and destructive revolutions which these occasioned; render it impossible to give any authentic account of the origin of the different kingdoms now established there. Everything beyond that short period to which well-attested annals reach, is obscure; an immense space is left for invention to occupy; each nation, with a vanity inseparable from human nature, hath filled that void with events calculated to display its own antiquity and lustre. History, which ought to record truth and to teach wisdom, often sets out with retailing fictions and absurdities.

3. Translate—

Non erat is populus quem pax tranquilla juvaret,
 Quem sua libertas immotis pasceret armis :
 Inde iræ faciles, et, quod suasisset egestas,
 Vile nefas : magnumque decus ferroque petendum
 Plus patriâ potuisse sua ; mensuraque juris
 Vis erat, hinc leges et plebiscita coactæ,
 Et cum Consulibus turbantes jura Tribuni.
 Hinc rapti pretio fascēs, sectorque favoris
 Ipse sui populus, letalisque ambitus urbi
 Annua venali referens certamina campo.
 Hinc usura vorax, avidumque in tempora fenus,
 Et concussa fides et multis utile bellum.

Classics.—V.

Two Hours and a half.

GENERAL QUESTIONS.

1. Give a brief account of a Greek Theatre, mentioning the principal technical terms relating to it, and to the performance of a Greek Play.
2. Contrast the Ionic dialect of Herodotus with the Attic of Thucydides.
3. Scan and give the metrical name of—

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|---|-------------------------------|
| (a) πόντου χειμερίῳ νότῳ. | (c) Liberat Hippolytum. |
| (b) σὲ δ' αὐτόγνωτος ὤλεσ' ὄργα. | (d) Virginea domitus sagitta. |
| (e) φανήτω μόρων ὁ κάλλιστ' ἐμῶν. | |
| (f) Vitæ summa brevis spem nos vetat inchoare longam. | |
4. Discuss the etymology of μέν, γάρ, ἕκαστος, post, dum, extra.
5. Explain the structure of the yearly calendar at Athens. Give as nearly as you can in its Greek form the date 16 September, 1871.
6. Analyse and explain the forming terminations in ἔφερον, ferebam, φέρουσι, ferunt.
7. Draw a rough outline of Rome showing the relative positions of the River, the Seven Hills, the Campus, and the Forum.
8. Græcia capta ferum victorem cepit, says Horace. Briefly indicate the influence of Greek upon Roman literature.
9. Write explanatory notes on—

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|---|
| (a) ὡς οὐδ' ἂν εἰς παύσαιτ' ἂν εἰ χρεῖη λέγειν. |
| (b) Immunis aram si tetigit manus, Non sumtuosa blandior hostia Mollivit aversos Penates. |
10. Translate and explain the following—(a) ἐν μὲν τόδ' ἤδη τῶν τριῶν παλαισμάτων. (b) ἐς νύκτα τελευτᾷν. (c) secunda locas marmora. (d) heres ex asse factus est.
11. Τίς, quis, hwá (old English for who) : water, wasser (German), ὕδωρ : Explain and illustrate the changes of form in the foregoing.
12. Give the meaning and the derivation of these Grammatical terms,—genitive, infinitive : cæsura, arsis : synæresis, ecthlipsis.

Classics.—VI.

Two Hours.

HISTORY OF GREECE.

1. Draw a rough outline map indicating the chief Greek colonies on the coast of Asia Minor and the adjacent islands.
2. Explain the meaning of the names—Cleruchi, Hellanodicæ, Prytanes, Rhapsodists, Sophistæ, Thesmothetæ.
3. Give a brief account with dates of (a) the Conspiracy of Harmodius and Aristogeiton, (b) the Despots of Corinth, (c) the Return of the Heraclidæ, (d) the Battle of Marathon.
4. Give an account of the great Athenian invasion of Sicily.
5. Name an important event belonging to each of the following years:—B.C. 560, 510, 500, 480, 431, 421, 411, 406.
6. Give a brief account of Anaximander, Archilochus, Codrus, Phidias, Phidippides, Polycrates, Tyrtæus, Zeuxis, with the approximate date of each.

HISTORY OF ROME.

1. Write notes upon Comitia Centuriata, Duodecim Tabulæ, Legio, Patres Conscripti.
2. Give a list of the Kings of Rome, the dates of their accession B.C., and mention the leading events of each reign.
3. Give the date, the locality, and a brief account of each of these battles—Metaurus, Regillus, Veseris, Zama.
4. What were the Licinian Rogations? Narrate briefly the struggle concerning them, and its results on the relations of the Two Orders.
5. Narrate briefly the chief events of the second and the third Samnite war.
6. Name an important event belonging to each of these years B.C.—499, 406, 390, 343, 339, 280, 216, 212.

NOTE.—Full marks were given for three-fourths of the foregoing History papers.

English.

Two Hours and a half.

MARSH AND SMITH—Student's Manual.

1. Analyse fully—

Printing has conferred an important benefit on language, by multiplying and putting within the reach of every man books of a class which, when literature existed only in a written form, were rarer than those of almost any other character. I refer to dictionaries, and other works of the comprehensive and encyclopædic class, which, although they cannot be said to owe their existence to printing, yet could never have obtained a general circulation without it. We know that ancient literature possessed works of this kind, but they were so little multiplied, that scarcely any of them have come down to us; nor did lexicography make a progress correspondent with that of other departments of knowledge, until after the art of printing had been long employed in the diffusion of general literature.

2. In the foregoing point out and derive fully any words of Greek origin.
3. In the foregoing parse the words multiplying, almost, little, after.
4. Decline these Old English (so called Anglo-Saxon) words,—dæl (a part), gód (good) as an indefinite adjective, the pronoun ic; and write down the present tense indicative of lufian, to love.

5. Tha rínde hyt, and thær cóm flod, and bleowon windas, and a-hruron on thæt hus; and thæt hus feoll, and his hryre was mycel.
Translate into modern English, comment on and illustrate any changes of form observable in particular words.
6. How is the want of an original inflexion for the future tense met in English and in the Germanic languages generally?
7. Explain and illustrate the processes of change of form which are seen in—benefit, chivalry, eye, gospel, likely, wrought.
8. Give the meaning and the derivation of the following Old English words :—nadistou, regrater, shepstere, tenpenny, tombestere, 'toxt.
9. State what you know of the date, authorship, language, and subject matter of the Canterbury Tales, the prose Edda, the Mæso-Gothic Gospels, the Vision of Piers Plowman.
10. Specify a few of the obsolete words in Shakspeare which may be explained from Celtic; and give their meanings.
11. Derive these words,—aneal, exorbitant, fetich, our, umpire, year.
12. Criticize the following derivations :—(a) world from whirled because it revolves. (b) grain from geregnan. (c) isle from insula. (d) Dungeon from (torre) de homenagem. (e) cattle from capitale.
13. Write a note on the Etymology of the principal words used in English in connection with writing and printing.
14. Define these Metrical Terms,—Alliteration, Assonance, Rhyme, Rhythm.
15. Name with dates the chief English Versions of the Bible.
16. Give with dates a brief notice of these writers and their works,—Bacon, Milton, Scott, Spenser.

French.

Two Hours and a half.

1. Translate—

Ces excroissances où, de vous-même, vous avez déviné un levier et un bouclier, ont déjà rendu d'autres services à ce faible végétal. Après lui avoir servi d'enveloppe dans un sol glacé, durci par l'hiver, le temps venu, elles lui ont prêté leurs mamelles nourricières, elles l'ont allaité alors que, simple germe, il n'avait point encore de racines pour aller chercher les sucres de la terre, ou de feuilles pour aspirer l'air et le soleil. Vous avez en raison, monsieur le comte : ces ailes protectrices, qui jusqu'à présent couvaient si maternellement la jeune plante, ne se développeront point avec elle : elles tomberont, mais après avoir accompli leur tâche, et quand leur pupille, pouvant se passer de leur aide, aura pris quelque force pour résister. Ne vous inquiétez pas de son avenir ; la nature veille sur cette herbe comme sur les autres plantes ses sœurs, et, tant que les vents du nord feront descendre des Alpes les brouillards humides et les flocons de neige, les feuilles nouvelles, encore dans le bourgeon, y trouveront un asile sûr, un logement disposé pour elles, fermé aux impressions de l'air, calfeutré de gomme et de résine, qui se distendra selon leurs besoins, ne s'ouvrira qu'à temps et sous un ciel favorable. Elles n'en sortiront que couvertes de chaudes fourrures, de duvets cotonneux qui les défendront des dernières gelées ou des caprices atmosphériques. Mère jamais a-t-elle vieilli avec plus d'amour à la conservation de ses enfants ? Voilà ce que vous sauriez depuis longtemps, monsieur le comte, si, descendant des régions abstraites de la science humaine, vous aviez autrefois daigné abaisser vos regards sur les simples et naïfs ouvrages de Dieu. Plus vos pas se seraient tournés vers le Nord, plus ces communes merveilles eussent surgi patentes à vos yeux. Là où le danger s'accroît, les soins de la Providence redoublent !

2. Translate into French—

All my acquaintances disappeared : I am neither surprised nor distressed by this : if I had been free in my actions, I should have anticipated them in this desertion, which is unbecoming only because of the time they chose. I know that, to exculpate themselves

from the baseness of their conduct towards me, they accuse me of having ruined my husband by my luxury. But I have learnt from you, my mother, that there is no true judge but our conscience, and mine is calm. Ah! if you were still with me, I would not hesitate to make a total surrender of my rights to my husband's heirs, for I am persuaded that his affairs, when settled, will still leave a considerable sum. My diamonds alone would suffice to enable us to live in that moderation after which I have always sighed. Advise me! What ought I to do? What will become of me?

3. Translate—

Cet avantage m'avait fait désirer l'invention d'un miroir moral, où tous les hommes pourraient se voir avec leurs vices et leurs vertus. Je songeais même à proposer un prix à quelque académie pour cette découverte, lorsque de mûres réflexions m'en ont prouvé l'inutilité.

Hélas! il est si rare que la laideur se reconnaisse et casse le miroir! en vain les glaces se multiplient autour de nous et réfléchissent avec une exactitude géométrique la lumière et la vérité: au moment où les rayons vont pénétrer dans notre œil et nous peindre tels que nous sommes, l'amour-propre glisse son prisme trompeur entre nous et notre image et nous présente une divinité.

Et de tous les prismes qui ont existé depuis le premier qui sortit des mains de l'immortel Newton, aucun n'a possédé une force de réfraction aussi puissante, et ne produit des couleurs aussi agréables et aussi vives que le prisme de l'amour-propre.

Or, puisque les miroirs communs annoncent en vain la vérité, et que chacun est content de sa figure, puisqu'ils ne peuvent faire connaître aux hommes leur imperfections physiques, à quoi servirait mon miroir moral? Peu de monde y jetterait les yeux, et personne ne s'y reconnaîtrait. Les philosophes seuls perdraient leur temps à se mirer. J'en doute même un peu.

4. Give the French for the following :—(a) Something more positive. (b) What could he have done more had his own life been concerned? (c) On his waking from that painful dream. (d) I almost killed my dog. (e) She arranged herself as best she could. (f) He discussed more than he observed.
5. What difference is there between the following English words and their etymological equivalents in French :—Address, front, instance, parent, pleasing, sentence?
6. Correct the following :—(a) Il la fit ouvrir ses yeux. (b) Je suis assisté de cet exécution. (c) Je ne le peut douter. (d) S'il arrivait que vous cherchiez nous fausser compagnie. (e) Il avait des agréables passes temps. (f) La plante le servit pour boussole.
7. Translate and explain—(a) le palmier de Latone, (b) le figuier Rumine, (c) des savants au collet vert, (d) faire jubilé à Rome, (e) véritable filet de Vulcan, (f) comme certains quiétistes.
8. Give the etymology and illustrate the formation of aubépine, cerveau, coléoptère, désormais, enchaîner, grinaud, préau, rez-de-chaussée, sourcil.
9. Give the rule for the use of tout as an adverb in French, and point out the resulting ambiguity.
10. Distinguish between apparaître, paraître: le couple, la couple: du moins, au moins: jour, journée: user, user de: vieillard, vieux.
11. Give the English of acajou, colifichets, essor, faïence, moineau, plafond.
12. Give the French for bitterness, basket, cambric, jewel, obstinacy, wax, with the gender of each.

Constitutional History of England.

Two Hours and a half.

HALLAM—Chapters VII. VIII. IX.

1. How did Charles I. invade the privileges of the House of Lords in the cases of the Earls of Arundel and Bristol?
2. Hampden sued for a writ of Habeas Corpus. Why? State briefly the arguments of counsel on the return to the writ; the judgment of the Court, and Hallam's comment upon it.
3. What were the main points taken up by Parliament in the Petition of Right?
4. How many parliaments did Charles I. summon before the Long Parliament? Under what circumstances was each dissolved?
5. What were proclamations? Specify some issued by Charles I.
6. Sketch briefly the character of Laud.
7. What was the Great Council of York? By whom was it assembled, and under what circumstances?
8. What was the precise question raised in Hampden's case? Who argued it for each side, and on what grounds? What was the judgment?
9. Enumerate the principal salutary measures of the Long Parliament and their main provisions.
10. What is Hallam's view as to the justice of Strafford's impeachment, and on what grounds is it based?
11. Hallam says that we must see in the conduct of the Parliament a series of glaring violations, not only of positive and constitutional principles, but also of those higher principles which are paramount to all immediate policy. Specify these fully.
12. What do you read in your Hallam of Clarendon, Eliot, Essex, Panzani, Prynne, and Vassal.