## LEAVING CERTIFICATE, 1897.

## Examination Papers.

## ENGLISH,

Lower Grade.

Tuesday, 15 th June. 10 A.m. to 12.30 p.m.
Every Candidate shonld answer nine questions, and no more, of which five must be in Section I., two in Section II., and two in Section III. Questions 1, 2, and 3 must be attempted.

## Section I.

1. Write out, and punctuate, the passage read for dictation.
2. Write a short essay of about two pages on one of the following subjects:-
(a) Any one of the Scottish characters in Scott's novels;
(b) A letter, as to a friend, giving a short account of a journey, real or imaginary, by land or sea.
3. Paraphrase the following lines, so as to bring out their full meaning :-

Great princes have great playthings. Some have play'd
At hewing mountains into men, and some
At building human wonders mountain high.
Some have amused the dull sad years of life
(Life spent in indolence, and therefore sad)
With schemes of monumental fame, and sought
By pyramids and mausolean pomp,
Short-lived themselves to immortalise their bones.
Some seek diversion in the tented field,
And make the sorrows of mankind their sport.
But war's a game which, were their subjects wise,
Kings would not play at. Nations would do well
To extort their truncheons from the puny hands
Of heroes, whose infirm and baby minds
Are gratified with mischief, and who spoil,
Because men suffer it, their toy, the World.
4. Parse the words italicised in the above passage.

Give the derivation of ten words of classical origin in the above passage.
5. Make a general analysis of the last sentence of the passage quoted in Question 3.

Explain, and give an example of (a) apposition, (b) coordinate sentence, (c) compound noun, (d) strong verb, (e) indirect object.
6. Give (a) the plurals of son-in-law, foot-soldier, man-servant, grouse, calf, hoof, series, covey.
(b) The feminines corresponding to waiter, executor, earl, czar, bachelor, nephew, buck, wizard.
(c) The past tenses and past participles of wear, bite, burst, bleed, lie (in both sense3), crow, grow.
7. Point out, and correct, any faults in the following sentences :-
(a) No sooner did he begin speaking, when he was interrupted.
(b) Knox was equally ardent in the matter of reform as Luther.
(c) All eyes watched breathlessly as he swam towards the shore.
(d) Incredulous as it may appear, it is nevertheless true.
(e) He proved himself one of the most sagacious men that was in power during that period.
8. Name one work of each of the following poets, and describe the contents and metre of any three of the poems you mention :Goldsmith, Cowper, Burns, Campbell, Scott, Southey, Byron, Tennyson.
9. Give a short description of a scene or incident from history, or drama, or fiction, which particularly impressed you.

## Section II.

(In the answers under this Section attention must be paid to accuracy and clearness of composition. Mere lists of events and dates will not be regarded as sufficient.)
10. Write a connected account of the character and career of any two of the following :-Edward the Confessor, Thomas à Becket, King John, Simon de Montfort, William Wallace, Henry V., Richard III., Thomas Cromwell, Sir Walter Raleigh, Strafford, Admiral Blake, Marlborough, Chatham, Sir Robert Peel, Beaconsfield.
11. Describe, so as to show their importance, any three of the following:-Council of Whitby, Strongbow's Invasion of Ireland, Mise of Amiens, Statutes of Labourers, Loss of Normandy and Guienne, Battle of Flodden, Babington's Plot, Barebones Parliament, Rye House Plot, Trial of Sacheverell, Peace of Aix-la-Chapelle, Trial of Warren Hastings, Battle of the Nile, Repeal of the Corn Laws, Capture of Sebastopol.
12. Write a short paper on one of the following :-The Heptarchy, The Hundred Years' War with France, Constitutional Reforms under Edward I., The Scottish Reformation, The Progress of Events during the Long Parliament, The British Occupation of India.

## Section III.

13. Describe the coast of England from Hull to Cardiff, mentioning the chief ports in order, with the main trade of each.
14. Name, and indicate the position of, the chief mountain ranges in Scutland and Wales.
15. Describe, or draw a map of, the basins of two of the following rivers; mention the chief towns on the banks of each; and state in what the indnstry of each town consists :-Clyde, Shannon, Thames, Loire, St. Lawrence.
16. Give an account of the geography, government, and products of the British colonies and dependencies in America.
17. Where are the following places:-Kiliecrankie, Carthage, Pondicherry, Oreç, Metz, Cape St. Vincent, Delhi, Drogheda, Quebec, Mecca? Choose five of those places, and say what important events are connected with them.
18. State what you know of the following:-Trade wind, sirocco, monsoon, gulf-stream, equinox, summer solstice, glacier, lagoon, cyclone, longitude.

## ENGLISH.

## Lower Grade.

Tuesday, 15th June. 10.45 A.m.

## Passage for Dictation.

I have indeed heard of heedless inconsiderate writers, that without any malice have sacrificed the reputation of their friends and acquaintance to a certain levity of temper, and a silly ambition of distinguishing themselves by a spirit of raillery and satire. When there is this petulant humour in an author, he is often rery mischievous without designing to be so. For this reason I always lay it down as a general principle, that an indiscreet man is more hurtful than an ill-natured one; for as the one will attack principally his enemies, the other injures indifferently both friends and foes.

## ENGLISH.

Higher Grade and First Paper for Honours Grade.
Tuesday, 15th June. 10 A.m. to 1 P.M.
Every Candidate should answer nine questions, and no more; and every Candidate must take questions 1 and 2 , and, in addition, three other questions in Section I.
Higher Grade Candidates should take, also, two questions in Section II., and two in Section III.
Honours Grade Candidates are not required to answer questions from Sections II. and III., but may do so. The full number of marks can be obtained in Section I.

## Section I.

1. Write a short essay of about two pages on one of the following subjects :-
(a) The changes which steam-power has wrought on the conditions of life in our century.
(b) Which is the most useful foreign language to study? and why?
2. Paraphrase the following poem, so as to bring out the full meaning:-

When to the sessions of sweet silent thought
I summon up remembrance of things past,
I sigh the lack of many a thing I sought,
And with old woes new wail my dear time's waste;
Then can I drown an eye, unused to flow,
For precious friends hid in death's dateless night,
And weep afresh love's long-since-cancelled woe,
And moan the expense of many a vanish'd sight.
Then can I grieve at grievances foregone,
And heavily from woe to woe tell o'er
The sad account of fore-bemoaned moan,
Which I new pay as if not paid before:
-But if the while I think on thee, dear Friend, All losses are restored, and sorrows end.
3. Give the derivations (a) of ten words of classical or romance origin, and (b) of ten words of native origin, in the above sonnet.
4. Make a general analysis of the following sentence, so as to show exactly how the clauses are related to one another :-
"Outraged as he was, Elizabeth believed that with Flanders still in revolt, and France longing for her alliance to enable it to seize the Lcw Countries, the Spanish King could not afford to quarrel with her ; and her trust in his inactivity seemed justified by the jealousy with which he regarded, and succeeded in foiling, the project for a Catholic revolt which was to have followed a descent of the Guises on the English coast."
Parse the words italicized in the following sentences:-
(a) You had better go.
(b) No one else had a word to say.
(c) I needs must wait.
5. Distinguish carefully, with illustrative examples, between (a) weak and strong verbs, (b) infinitive and gerund, (c) synthetic and analytic languages, ( $d$ ) metaphor and simile, (e) accidence and syntax.
6. Explain the following terms as applied to style :-diffuse, elliptical, terse, ironical, pedantic, aphoristic, colloquial, euphemistic, florid, bombastic.
7. Improve the following sentences, and give reasons for the alterations you make:-
(a) Round the romantic Linn of Avon hangs a rich vein of legendary lore.
(b) Though such faults undoubtedly deteriorate from his greatness, he yet rises supreme among his contemporaries.
(c) This uncle had usurped the kingdom, while Hamlet was grieving at his father's death, and shortly afterwards married his mother.
(d) No one will affirm but that the language of Chaucer seems not yet to have attained its manhood, but, there is a glorious future in store for her.
(e) A nother feature of the bay is the rocks being honeycombed with caves, that enter into serious competition with the bathing-machines, which, however, will be found dnly drawn up on the beach used by both sexes, while one strip is set apart for men and another for ladies.
8. Take any ten of the following characters, and name the works in which they appear :-Iago, Lady Castlewood, Madame Eglantine, Mr. Burchell, Elaine, Abdiel, Oressida, Mr. Peggotty, Laertes, Meg Merrilies, Palamon, Beëlzebub, Pistol, Dugald Dalgetty, Duessa, Merlin, Jessica, Alan Breck, Becky Sharp, Amyas Leigh. Describe briefly any two of these characters.
9. Define, as accurately as you can, the following kinds of poetry :epic, ballad, narrative poem; ode, elegy, idyll; sonnet, hymn, song. Name an example of each kind from English Literature, and give a short description of its contents and metre.

## Seotion II.

(In the answers under this Section attention must be paid to accuracy and clearness of composition. Mere lists of events and dates will not be regarded as sufficient.)
10. Write a connected account of the character and career of any two of the following :-Edward the Confessor, Thomas à Becket, King John, Simon de Montfort, William Wallace, Henry V., Richard III., Thomas Cromwell, Sir Walter Raleigh, Strafford, Admiral Blake, Marlborough, Chatham, Sir Robert Peel, Beaconsfield.
11. Describe, so as to show their importance, any four of the fol-lowing:-Council of Whitby, Strongbow's Invasion of Ireland, Mise of Amiens, Statutes of Labourers, Loss of Normandy and Guienne, Battle of Flodden, Babington's Plot, Barebones Parliament, Rye House Plot, Trial of Sacheverell, Peace of Aix-la. Chapelle, Trial of Warren Hastings, Battle of the Nile, Repeal of the Corn Laws, Capture of Sebastopol.
12. Write short papers on any two of the following:-The Heptarchy, The Rise and Influence of the Town Guilds, The Hundred Years' War with France, Constitutional Reforms under Edward I., A Comparison of the English and Scottish Reformations, The Progress of Events during the Long Parliament, The Freedom of the Press, The British Occupation of India, Educational Reform in our Century.

## Section III.

13. Describe the coast of England from Hull to Cardiff, mentioning the chief ports in order, with the main trade of each.
14. Name, and indicate the position of the chief mountain ranges in Scotland and Wales. What influence has the physical geography of these two conntries had upon their history?
15. Describe (or draw a map of) the basins of three of the following rivers, in each case indicating the position, and the historical or commercial importance of the principal towns:-Clyde, Shannon, Loire, Danube, Nile, Indus.
16. Give an account of the geograply, government, and products of the British colonies and dependencies in America.
17. Where are the following places, and what important events are associated with them:-Killiecrankie, Carthage, Pondicherry, Creçy, Metz, Cape St. Vincent, Delhi, Drogheda, Quebec, Mecca?
18. State what you know of the following:-Trade wind, sirocco, monsoon, gulf stream, equinox, summer solstice, glacier, lagoon, cyclone, longitude.

## ENGLISH.

## Honours.-Second Paper.

Monday, 21 st June. 10 A.m. to 1 p.m.
About six questions should be answered. At least FOUR of these must be taken from Section I.

## Section I.

1. Describe the Church of Chaucer's day as it is represented in The Prologue ; and contrast the attitude of Chaucer to the social and religious movements of his time with that of Langland.
2. State the plan of The Faerie Queene. To what extent is the Elizabethan age reflected in it? Describe the Spenserian stanza, and compare it with the Chaucerian stanza (or rime royal).
3. "Shakespeare has drawn no perfect hero." Discuss this statement.
4. Who were the Cavalier poets, and what are the characteristics of their poetry? State what you know of the life and work of any one of them.
5. In what respects is the prose of the eighteenth century an improvement upon that of earlier times? Why is the development of prose later than that of poetry?
6. Give an account of the characters and works of three of the leading contemporaries of Dr. Johnson.
7. "Every great poet is a teacher." Discuss this statement of Wordsworth, and illustrate your answer by reference to Wordsworth and any of the cther poets of our century.
8. Describe the various forms of the English sonnet, name the English poets who have made most use of the sonnet, and give a detailed account of at least one sonnet by each of those whom you name.
9. Write a short descriptive note (with name of author and proximate date) on each of the following:-Parlement of Foules, Morte D'Arthur, Arcadia, Comus, Absalom and Achitophel, Battle of the Books, Christabel, Legend of Montrose, Adonais, Henry Esmond.
10. Compare or contrast the members of any one of the following groups:-(a) Chaucer and Spenser, (b) Milton and Bunyan, (c) Dryden and Pope, (d) Swift and Carlyle, (e) Dunbar and Burns, $(f)$ Shelley and Keats.

## Section II.

## Optional Questions.

11. Translate into Modern English :-
pisum wordum eðer pæs cyninges wita and ealdormann gepáfunge sealde and to pæ̈re spréce feng and pus cwreð "pyslic me is gesewen, cyning leófosta, pis andwearde lif manna on eorð̈an to wiðmetenisse pæ̋re tíde, •je ús uncúठ̋ is, swá gelíc swá pu æt swêsendum sitte mid pínum ealdormannum and pegnum on wintertíde, and sí fýr onæled, and pín heall gewyrmed, and hit ríne and sníwe and styrine úte; cume ponne án spearwa and hræðllíce pæt hús purhfleó, purh ờre duru in, purh oore út gewíte : hwæt he on !pá tíd, pá he inne býo, ne býd ríned mid pý storme pæs wintres ! ac pæt býð án eágan bryhtm and pæt læste fæc, and he sóna of wintra in winter eft cymer. Swá ponne pis manna lif to medmyclum fæce ætýwer; hwæt pex r foregénge, oठððe hwæt pêr æfterfylige, we ne cunnon. Forpam gif peós niwe láre áwiht cúðlícre and gerisenelícre bringe, heo pæs wyrbe is, pæt we pæære fyligean."
12. (a) Give the 3rd sing. present, 3rd sing. preterite indicative, and past participle of the strong verbs in the above passage.
(b) Account for the letters italicized in the following words:-its, stable, rather, farther, lesser, ought, once, molten.
13. Estimate briefly the influence on the language of the successive conquests of Britain. Indicate the most important changes in English grammar and vocabulary since Chaucer. At what periods hare they occurred ?
14. "English is the least inflected and the most composite of modern European languages." Discuss the gains and losses incident to these characteristics.
15. State what you know of English vernacular literature during the thirteenth and the first half of the fourteenth century.

## LATIN.

## Lower Grade.

Thursday, 17th June. 10 A.m. to 12.30 P.m.

## Candidates should in all cases attempt Question 1.

1. Translate into Latin :-

At last they came to Zama, and while Metellus was attempting to storm the town, Iugurtha surprised his camp. Though beaten off in this assault he attacked the Romans again next day, and Metellus was obliged to give up his enterprise. After garrisoning the towns which he had taken, he went into winter quarters at Utica, where he proceeded to tamper with Bomilcar. That
traitor urged Iugurtha to surrender, and the king gave up his elephants, the deserters, and a large sum of money. But when it came to giving up himself his beart failed him, and, having discovered Bomilcar's treachery, he slew liim and once more resolved to fight.
2. 'Translate into English :-

The Lessons of Roman History for a Prince.
(a) Antiquos evolve duces, adsuesce futurae
militiæ, Latium retro te confer in aevum.
libertas quaesita placet? mirabere Brutum.
perfidiam damnas ? Metti satiakere poenis.
triste rigor nimius? Torquati despice mores.
mors impensa bonum? Decios venerare ruentes.
vel solus quid fortis agat, te ponte soluto
oppositus Cocles, Muci te flamma docebit;
quid mora perfringat, Fabius; quid rebus in artis
dux gerar, ostendet Gallorum strage Camillus.
discitur hinc nullos meritis obsistere casus:
prorogat æternam feritas tibi Punica famam,
Regule; successus superant adversa Catonis.

## The Value of a Camp.

(b) Maiores vestri castra munita portum ad omnes casus exercitus ducebant esse, unde ad pugnam exirent, quo iactati tempestate pugnae receptum haberent. ideo quum munimentis ea saepsissent, praesidio quoque valido firmabant, quod qui castris exutus erat, etiamsi pugnando acie vicisset, pro victo haberetur. castra sunt victori receptaculum, victo perfugium. quam multi exercitus, quibus minus prospera pugnae fortuna fuit, intra vallum compulsi, tempore suo, interdum momento post, eruptione facta victorem hostern pepulerunt! patria altera est militaris hæc sedes, vallumque pro moenibus, et tentorium suum cuique militi domus ac penates sunt.
3. (a) Give the (1) meaning, (2) gender, (3) ablative singular and ablative plural of the following nouns:-semen, vulnus, dos, specus, caedes, auspex, cervix, merces, lanx, nix. When the ablative singular is a word of three syllables, mark the quantity of the last syllable but one.
(b) Parse the following words, and give the Ist person present indicative active, and other principal parts, of the verbs from which they come :-morerre, morëre, cecǐderint, cecīdissem, sustulerunt, vicistis, vĕnirent, vèneunt, quieveras, ratus es.
(c) Explain, with examples, the force of the adjectival terminations -ax, -bundus, -osus, -aris, -bilis. What is the Latin for -by night, by day, yesterday, to-day, to-morrow? Give the corresponding adjective in each case.
(d) Explain and illustrate the coustructions of the prepositions praeter, prae, pro, propter.

## 4. Translate into Latin :-

1. I will do it if you order me.
2. He said that he would do it if I ordered him.
3. At what price do you sell this? At ten asses.
4. Nothing helps an orator so much as confidence.
5. I cannot speak on this subject without betraying his plans.
6. Describe a Roman warship. When did the Romans become a naval power, and what were the chief occasions on which they fought at sca ?

## LATIN.

Higher Grade and First Paper for Honours Grade.
Thursday, 17 th June. 10 A.m. to 1 P.m.
Candidates will not receive a Certificate unless they reach the necessary standard both in Prose Composition and in Translation.

1. Translate into Latin :-

Un returning to Utica, Pompeius found a message from Sulla, telling him to disband his troops except one legion, and wait till his successor came. The men mutinied, for they liked Pompeius, and Sulla was told that Pompeius was in rebellion. He remarked that "In his old age it was his fate to fight with boys," a saying to which Pompeius' speech, that "More men worshipped the rising than the setting sun," may have been intended as a rejoinder. But soon he was relieved by hearing that the politic Pompeius had appeased the mutiny. Sulla had the art of yielding with a good grace when it was necessary, and, seeing how popular Pompeius was, he went out to meet him on his return and greeted him by the name " Magnus."
2. Translate into English :-
(a)

Alins sit fortis in armis
sternat et adversos Marte favente duccs,
ut mihi potanti possit sua dicere facta miles et in meusa pingere castra mero.
quis furor est atram bellis arcessere mortem? imminet et tacito clam venit illa pedie.
non seges est infra, non vinea culta, sed audax Cerberus et Stygias navita turpis aquae :
illic rescissisque genis ustoque capillo errat ad obscuros pallida turba lacus.
quam potius laudandus hic est quem prole parata occupat in parva pigra senecta casa!
sic ego sim, liceatque caput candescere canis temporis et prisci facta referre senem.
3. Non L. Paulum minorem aut maiorem imperatorem triumphus faciet:-militum magis in hoc universique populi Romani fama agitur, primum ne invidiae et ingrati animi adversus clarissimum quemque civem opinionem habeat, et imitari in hoc populum Atheniensem, lacerantem invidia principes suos, videatur. satis peceatum in Camillo a maioribus vestris est, quem tamen ante receptam per eun a Gallis urbem violarunt ; satis insuper a vobis in P. Africano. Literni domicilium et sedem fuisse domitoris Africae! Literni sepulcrum ostendi! erubescamus, gloria si par illis viris L. Paulus iniuria vestra exaequetur. haec igitur primum infamia deleatur, foeda apud aliaz gentes, damnosa apud nostros. quis enim aut Africani aut Pauli similis esse in ingrata et inimica bonis civitate velit? si infamia nulla esset et de gloria
tantum ageretur, qui tandem triumphus non communem nominis Romani gloriam habet? tot de Gallis triumphi, tot de Hispanis, tot de Poenis ipsorum tantum imperatorum an populi Romani dicuntur?
3. Translate into Latin :-
(a) What was I to do? I had no one to consult, and the enemy was in sight.
(b) If we are to give an account of what we have done, we claim that the judges be impartial.
(c) If he had learned this one fact, not only would he never have done what he did, but he would not have thought of it.
(d) If you are envied, disregard it. If you are hated, forget it. If you are flattered, despise it.
(e) Nobody thought that anyone would escape; but it so fell out that any soldier whatever had some hope of safety.
4. Describe shortly the position and powers of the Senate at various periods in Roman history ;
$O r$
Explain carefully the structure of the "Hexameter" and "Pentameter," giving the scansion of the last four lines in passage $2(a)$.

## LATIN.

## Honours. Second Paper.

Monday, 21st June. 2 to 5 P.m.

1. Translate into Latin :-

I make it a question whether any wise prince or state, in the continuance of a war, which was not purely defensive, or immediately at his own door, did ever propose that his expense should perpetually exceed what he was able to impose annually upon his subjects. Neither, if the war last many years longer, do I see how the next generation will be able to begin another; which in the course of human affairs, and according to the various interests and ambition of princes, may be as necessary for them as it hath been for us. And if our fathers had left us deeply involved, as we are likely to leave our children, I appeal to any inan, what sort of figure we should have been able to make these twenty years past. Besides, neither our enemies nor our allies are upon the same foot with us in this particular. France and Holland, our nearest neighbours, will much sooner recover themselves atter a war.
2. Translate into English:-
(a) Multa dies variique labor mutabilis aevi rettulit in melius, multos alterna revisens lusit et in solido rursus Fortuna locavit. non erit auxilio nobis Aetolus et Arpi : at Messapus erit felixque Tolumnius et quos tot populi misere duces, nee parva sequetur gloria delectos Latio et Laurentihus agris.
cst. et Volscorum egregia de gente Camilla, agmen agens equitum et florentes aere catervas. quod si me solum Teucri in certamina poscunt idque placet tantumque bonis communibus obsto. non adeo has exosa manus Victoria fugit ut tanta quicquam pro spe temptare recusen. ibo animis contra, vel magnum praestet Achillem factaque Volcani manibus paria induat arma ille licet. vobis animam hane soceroque Latino Turnus ego, haud ulli veternm virtute secundus, devovi, solum Aeneas vocat, et vocet oro, nec Drances potius, sive est haec ira deorum, morte luat, sive est virtus et gloria, tollat.
(b) Num quid accidere tibi, si damneris, potest durius quann ut mittaris in exilium? ut ducaris in carceren? num quid ultra quicquam ulli timendum est quam ut uratur? qusm ut pereat? singula ista constitue et contemptores eorum cita, qui non quaerendi sed eligendi sunt. damnationem suam Rutilins sic tulit, tamquam nihil illi molestum aliud esset quam quod male iudicaretur. exilium Metellus fortiter tulit, Rntilius etiam libenter: alter, ut rediret, rei publicae praestitit, alter reditum suum Sullae negavit, cui nihil tunc negabatur. in carcere Socrates disputavit et exire, cum essent qui promitterent fugam, noluit remansitque, ut duarum renum gravissimarmn hominibus metum demeret, mortis et carceris. Mucius ignibus manum imposuit. acerbum est uri, quanto acerbius, si id te faciente patiaris! vides hominem non eruditum nec ullis praeceptis contra mortem aut dolorem subornatum, militari tantun robore instructum, poenas a se inriti conatus exigentem : spectator distillantis in hostili foculo dexterae stetit nec ante removit nudis ossibus fluentem manum quam ignis illi ab hostibus subductus est. facere aliquid in illis castris felicius potuit, nihil fortius.
3. Translate the following passages, explaining, and illustrating by example, all peculiarities of expression or construction:-
(a) anulus in digito subter tenuatur habendo.
(b) dic, hospes, Spartae, nos te hic vidisse iacentes,
dum sanctis patriae legibus obsequimur.
(c) verum anceps pugnae fuerat fortuna; fuisset; quem metui moritura? faces in castra tulissem implessemque foros flammis natumque patremque cum genere extinxem.
(d) sunt multi qui eripiunt aliis quod aliis largiantur.
(e) impetrare non potui, quod religione se impediri dicerent.
( $f$ ) Agricola solebat narrare, se prima in iuventa studium philosophiae acrius hausisse ni prudentia matris coercuisset.
4. Write a short Latin letter or essay, describing any iniportant crisis in colonial or forcign affairs that has occurred during the last three years.

## Or,

Translate into Latin Hexameters or Elegiacs :-
On this lone isle whose rugged rocks affright
The cautious pilot, ten revolving years
Great Poeas' son, un wonted erst to tcars,

Wept o"er his wound ; alike each rolling light
Of heaven he watched, and blamed its lingering flight ;
By day the sea-mew screaming round his cave
Drove slumber from his eyes; the chiding wave
And savage howlings chased his dreams by night.
Hope still was his : in each low breeze that sighed
Through his low grot, he heard a coming oar-
In each white cloud a coming sail he spied;
Nor seldom listened to the fancied roar
Of Oeta's torrents, or the hoarser tide
That parts famed Trachis from the Euboic shore.
5. Auswer one (not both) of the following:-
(a) Trace briefly the chief causes which led to the fall of the Republic, and the establishment of the Empire.

Or,
(b) In what department of literature did the Romans show most originality, and in what did they most closely follow Greek models ?

## GREEK.

## Lower Grade.

$$
\text { Wednesday, 16th June. } 2 \text { to } 4.30 \text { р.M. }
$$

I. Translate:-













1I. Translate into Greek :-
(1) May the gods accept the gifts which we have given!
(2) We have ordered these men to stand outside the temple.
(3) Do you not know what kind of men your enemies are ?
(4) Come forward ( $\pi a \rho \rho^{\prime} f x$ opal, aor. imper.) and tell us every thing before you go away.
(5) The Atheuians confess ( ${ }^{\circ} \mu 0 \lambda$ oreiv) that they were the first to break ( $\lambda v_{\epsilon \nu \nu}^{\prime}$ ) the peace.

 ă ävv.


Give datives, sing. and plur. (all genders), of єipús, éќxy, ǐycins, $\pi \rho \tilde{\alpha} \sigma \varsigma, \tau \alpha ́ \lambda \alpha \varsigma, \pi \lambda \hat{\epsilon} \omega \varsigma$.
(b) Give the chief parts of the following verbs :-aip $\tilde{\sim}, \alpha i \rho \omega, \theta ı \gamma \gamma \dot{\alpha} \nu \omega$,



(c) Translate:-







GREEK.
Higher Gradm and First Paper for Honours Grane.
Wednesday, 16th June. 2 to 5 P,M.
(Candidates will not receive a Certificate unless they reach the necessary Stundard both in Grammar and Translation.)
I. Translate:-














II. Translate one of the following passages :-




## Human Life.


















1II. Translate into Greek :-
(1) Being asked of what country he was, he said he was a Persian.
(2) They perceived that he had too small a force to be of any use to his friends.
(3) I should not have thought that such a man would bear misfortune so bravely.
(4) When I have accomplished this task, I will return to take you with me into Greece.
(5) We sent a herald to Plataea, bidding them to do nothing further till we had decided about the prisoners.
(6) Socrates was condemned to death, though he had in no way violated the laws of the city.
IV. (1) Give (a) Fut. ind. 2nd plur. of í $\dot{\rho}^{\alpha} \omega$ and è $\pi \alpha a v \tilde{\omega}$.

(c) 2nd aor. opt. 3rd sing. of ä $\lambda i ́ \sigma \kappa \circ \mu a \iota$ and $\phi \theta \alpha ́ v \omega$.
(d) Perf. pass. 3rd sing. of $\dot{\alpha} a \lambda(\sigma \kappa \omega$ and $\dot{\omega} \theta \tilde{\omega}$.



Write down the Greek of " Ulysses," "Heracles," "Draco," " Helot," addling the genit. and acc. of each noun.
(2) Translate, explaining points of idiom :-





Express idiomatically in Greek :-
(a) You cannot go away too soon.
(b) I deny the truth of this.
(c) I despise death in comparison with disgrace.
(d) I have a right to ask this.

Distinguish between the meaning of the active and the middle voice of- $\lambda a \mu \beta a ́ v e \Delta v, a ̈ \pi \tau \epsilon \iota \nu, \phi \nu \lambda a ́ \tau \tau \epsilon \iota, \mu \iota \sigma \theta_{0} \tilde{\nu} \nu$.



## GREEK.

> Honours.-Second Paper.
> Thursday, 17th June. 2 to 5 p.m.

1. Translate:-



















[The speaker is Menelaus, shipwrecked on the coast of Egypt.]














II. For Greek prose :-

Next day, in the assembly, Cleon violently attacked the populace for the inconstancy they had displayed, warning them at the same time that it was the height of madness for a people with such inperial respousibilities as theirs to give way to unwise tenderness of heart. The Mytilenæans had inflicted on them grievous injury without provocation, and unless stern justice were meted out there would be fresh outbreaks of these troubles in the not distant future. They ought to adhere to their former decision, and turn a deaf ear to politicians whose prime aim was not the comwonwealth but self.
III. (a) Sketch briefly the development of the article in Greek, commenting on the following passages :-

 өу ŋ̃ бкоу.
(b) Explain the following case usages :-
(1) $\lambda \sigma^{\prime} \epsilon \sigma \theta a \iota$ тот $\alpha \mu о \hat{o}$.


(4) $\psi \eta ́ \phi ı \sigma \mu \ldots \alpha$ укк̃̃.
(c) Translate, with short notes on the syntax ;-

[Express this in Oratio Recta.]


fV. Answer one of the following questions :-

1. Describe, with examples, the character of the tupayy's in Corinth, Sicyon, and Megara.
2. Sketch the life and character of Cimon.
3. Enumerate, with dates, the chief confedcracies of Greece, and indicate in each case the special causes of their weakness.

## FRENCH.

## Lower Grade.

Wednesday, 16 th June. 10 A.m. to 12.30 P.м.
Candidates must, in all cases, answer all questions in Section I., and should attempt four questions (NOT MORE) from among the other sections.

## Section I.

1. Translate into English :-
(a) Murat se promena quelques minutes à grands pas dans la chambre ; puis il s'assit sur son lit et laissa tember sa tête dans ses deux mains. Sans doute, pendant le quart d'heure où il resta ainsi absorbé dans ses pensées, il vit repasser devant lui sa vie tout entière, depuis l'auberge d'où il était parti jusqu'au palais où il était entré ; sans doute, son aventureuce carrière se déroula pareille à un rêve doré, à un mensonge brillant, à un conte des Mille et Une Nuits. Comme un arc-en-ciel, ses deux extrémités se perảaient dans les nuages de sa naissance et de sa mort.
(A. Dtmas.)
(b) Un cheval vigoureux, monté par un enfant,
Semblait s'en amuser au milieu d'une plaine,

Tantôt effleurant (1) l'herbe à peine,
Tantôt sautant, caracolant (2).
"Quoi!" lui dit un taureau, mugissant de colère,
"Un écuyer pareil te gouverne à son gré !
Comment n'en es-tu pas outré (3) ?
Va , jette-le dans la poussière."
-"Moi ! " répond le noble coursier.
" Ce serait là vraiment un bel exploit de guerre !
Aurais-je à me glorifier
De jeter un enfant par terre?"
(La Motte.)
(1) Skimming over; (2) gambolling ; (3) angry.
2. Give the two participles, and the 1st and 3rd persons, singular and plural, of the present indicative and present subjunctive of venir, pouvoir, faire, lire, and écrire.
3. Translate into English, and write in the plural in French :-Un vieil ami ; il m'a donné un cheval ; mon fils est arrivé.
4. Translate into English, and write in the feminine in French :-Le héros de ce livre est un tout petit garçon; il est écolier, doux et gentil; le neveu du maitre est malade.
5. Translate into French :-
"What shall I do with this money now," says I, "for I have nowhere to put it?" "Why, have you no pockets?" says he. "Yes," says I, "but they are full of holes." Nothing could he more perplexing than this money was to me all that night. I carried it in my hand a good while; at last I sat down and pulled off one of my shoes and put the four guineas into that, but after I had gone awhile my shoe hurt mc o I could not go, so I had to sit down again and take it out of my shoe and carry it in my hand. Well, I carried it home with me to my lodging,
and when I went to go to sleep I knew not what to do with it, but lay with it in my hand, and my hand in my bosom, but then sleep went from my eyes. Oh, the weight of human care! I, a poor beggar-boy, could not sleep so soon as I had but a little money to keep, who, before that, could have slept upon a heap of bricks, stones or cinders, or anywhere, as sound as a rich man does on his down bed,* and sounder too.
(Defoe.)

* Down bed $=$ lit de duvet.


## Section II.

6. State the difference between the form of an English and that of a French question, and translate :-

Will your letter be posted in time ?
Did you reply to his question?
Is your sister at home?
7. State when some is to be expressed in Freach by (1) $d u$, $d e l a$, des; (2) de; (3) quelque, quelques; and write one short French sentence as an example of each rule.
8. Translate into French:-

Would he not have been happy if his friend had come and played this afternoon with him?

He had written to him, but it is now too late for him to come.
What time do you intend going home this eveuing?
About a quarter to six.
Last winter was very wet, so we did not get much skating.
9. Translate into English :-
(a) N'y a-t-il personne ici qui veuille me ressusciter, en me rendant mon cher argent, ou en m'apprenant qui l'a pris? Il faut, qui que ce soit qui ait fait le coup, qu'avec beaucoup de soin il ait épié l'heure ; et l'on a choisi justement le temps où je parlais à mon traitre de fils. Sortons. Je veux aller chercher la justice et faire donner la question à toute ma maison, à servantes, à valets, à fils, à fille, et à moi aussi.
(Molière.)
(b) Boileau est un des plus populaires de nos poètes classiques. Depuis deux siècles, ni aucun gouvernement, ni aucun système d'enseignement ne l'a retranché des études nécessaires. Nous apprenons à lire dans ses ouvrages; nous en sommes imbus; Boileau est dans nos veines. On n'est pas libre en France de ne pas lire Boileau . . . . Pour moi, je l'estime si excellent qu'il n'en est pas un, dans notre pays, dont je trouve plus vrai, ce que lui-même a dit de Homère :-

C'est avoir profité que de savoir s'y plaire.
(D. Nisard.)

## Section III.

10. Translate into French:-
(a) The school hours were long and Tom's patience short, so that soon he began to descend into the street, and go and peep
in at the school door and the wheelwright's* shop, and look out for something to while away the time.
(Tom Brown's Schooldays.)

* Charron.
(b) From the hearthstone, from the chimney; from the clock, the pipe, the kettle, and the cradle; from the floor, the walls, the ceiling, and the stairs; from the cart without, and the cupboard within, and the household implements; from everything and every place fairies came trooping forth.
(Сн. Dickens.)


## Section IV.

11. State what you know of one of the works of one of the following writers :-Racine, Fénelon, B. de St. Pierre, Châteaubriand, Lamartine, La Fontaine.
12. Give, in French, a short account of your doings on one day of your holidays.
13. (a) Translate into French :-

Some railway shares; the board of directors; a branch of a bank; a fire insurance policy; a life insurance policy; marine insurance; a wholesale dealer; a postal order; the company is issuing fresh debentures; the iron market was very firm yesterday ; stockbroking.
(b) Translate into English:

Un commanditaire ; un comptable; un courtier en laines; un connaissement; une facture acquittée ; il a déposé son bilan; le prix d'achat doit être indiqué sur la commande.

## FRENCH.

Higher Grade and First Paper for Honours Grade.
Wednesday, 16 th June. 10 A.M. to 1 p.m.
Condidates must, in all cases, answer Questions 1 and 2, Sestion I.; and should attempt six questions (not more) from the other sections.

1. Translate:-
(a) Seigneur, avce raison je demeure étonnée.

Je me vois dans le cours d'une même journée,
Comme une criminelle amenée en ces lieux ;
Et lorsqu'avec frayeur je parais à vos yeux,
Que sur mon innocence à peine je me fie,
Vous m'offrez tuut d'un coup la place d'Octavie.
J'ose clire pourtant que je n'ai mérité
Ni cet excès d'honneur, ni cette indignité.
Et pouvez-vous, seigneur, souhaiter qu'une fille
Qui vit presque en naissant éteindre sa famille,
Qui dans l'obscurité nourrissant sa douleur,
S'est fait une vertu conforme à son malheur,
Passc subitement de cette nuit profonde
Dans un rang qui l'expose aux yeux de tout le monde,
Dont je n'ai pu de loin soutenir la clarté,
Et dont une autre enfin remplit la majesté?
(Racine : Britannicus.)

Brins d'osier, brins d'osier,
Courbez-vous assouplis sous les doigts du vannier.
Brins d'osier, vous serez le lit frêle où la mère
Berce un petit enfant aux sons d'un vieux couplet; L'enfant, la lèvre encore toute blanche de lait, S'endort, en souriant dans sa couche légère.

Brins d'osier, brins d'osier,
Courbez-vous assouplis sous les doigts du vannier.
Vous serez le panier plein de fraises vermeilles Que les filles s'en vont cueillir dans les taillis;
Elles reutrent le soir, rieuses au logis,
Et l'odeur des fruits mûrs s'exhale des corbeilles.
Brins d'osier, brins d'osier.
Courbez-vous assouplis sous les doigts du vannier.
(A. Theveiet.)

## Le Corbeau.

(c) Ce facétieux personnage a dans la plaisanterie l'nvantage que donve lo sérieux, la gravité, la tristesse de l'habit. J'en voyais un tous les jours dans les rues de Nantes, sur la porte d'une allée, qui, en demi captivité, ne se consolait de son aile rognée ${ }^{1}$ qu'en faisant dcs niches aux chiens. Il laissait passer les roquets ${ }^{2}$; mais, quand son œil malicieux avisait un chien de belle taille, digne entin de son courage, il santillait par derrière, et, par une manœuvre habile, inapeerçue, tombait sur lui, donnait deux piqûres de son fort bec noir; le chien fuyait en criant. Satisfait, paisible, et grave, le corbeau se replaçait à son poste, et jamais on n'eût pensé que cette figure de croque-mort vînt de prendre un tel passe-temps.

$$
{ }^{1} \text { clipped ; }{ }^{2} \text { pugs. }
$$

2. Translate into French :-

When I travelled, I toek a particular delight in hearing the songs and fables that are cone from father to son, and are most in vogue among the common people of the countries through which I passed; tor human nature is the same in all reasonable creatures; and whatever falls in with it will meet with admirers amongst readers of all qualities and conditions. Molière, as we are told by Monsieur Boileau, used to read all his comelies to an old wonlan who was his housckeeper, as she sat with him at her work by the chimney corner; and could foretell the success of his play in the theatre from the reception it met at his fireside; for he tells us that the audience always followed the old woman, and never failed to laugh in the same place.
(Adpison.)

## Section II.

3. Give the first person, singular and plural, of the present, imperfect and preterite indicative of prévoir, s'engager, jaillir; the second person, singular and plural, of the future and pluperfect indicative of subvenir and s'orienter; and the two participles (with the auxiliary verb used in each case) of fuillir, feindre, naître, pourvoir, mourir.
4. (a) Translate:-
(1) Into French.-Go and ask her why she persists in ringing my bell, after you have just told her I intended writing to her.
(2) Into English.-Après l'avoir entendue chanter, on se sentait sans s'en rendre compte pouvoir oublier le boire et le manger à l'écouter.
(b) State the rules according to which you use a different tense or mood in French verbs from the English.
5. (a) Write in full in French.-Wednesday, June 16th, 1897, from 10 A.m. to 1 P.M.
(b) Form shart French seutences, showing which Erench numbers take the mark of the plural and when they remain invariable.
6. Give, and illustrate fully, the rules governing the use of French adjectives qualifying gens.
7. (a) Translate into idiomatic French :-
(1) He was caught in the act.
(2) He will smart for it.
(3) As you like it.
(b) Translate into idiomatic English :-
(1) Entre chien et loup.
(2) Charbonnier est maître chez lui.
(3) A bon entendeur, salut !

## Section III.

8. Write in modern French :-
"Teil chevalier n'ot en la terre
D'armes porter, de faire guerre."
(Roman de Brut.)
And comment on the different syntax shown in your rendering.
9. Write in modern French :-

Si je vous ai de rien mesfait, je vous le desferai; l'un par l'autre.

And comment on the different syntax shown in your rendering.
10. Give and account for the etymology of -
(a) The following nouns : joue, gaîne, hêtre.
(b) The following verbs : aider, craindre, choir.
11. Give the origin of the following "learned" words, with the meaning of each word, and, in each case, ancther French word of "popular" formation from the same Latin origin, with its meaning: intègre, décanat, fabrique, légal, charité, libérer, penser, hôpital.

## Section IV.

12. State in Frenclı what you know of one of the following writers and his works: Ste Beuve, H. Taine, F. Coppée, Alphonse Daudet, E. Renan.
13. State in French what you know of one of the works of one of the following writers: Racine, Boileau, Pascal, Bossuet, J. J. Rousseau, Mme. de La Fayette.
14. State what you know of the influence of (a) Malherbe on French Poetry, (b) Descartes on French Prose, (c) Corneille on French Tragedy.

## Section V.

15. Translate into English and answer in French the following letter :-

Paris, 8 septembre, 1896.
Messieurs C... Frères, Dijon.
Messieurs,
Nous sommes fâchés d'avoir à vous dire que notre traitc sur vous pour $1,840 \mathrm{fr}$., nous est revenue protestée, avee 22 fr .50 c . de frais.

N'ayant pas reçu un mot d'explication, nous ne savons que penser de cette affaire.

Avant de commencer des poursuites, nous voudrions savoir quelles raisons vous pourez donner, ou si vous êtes prêts à nous envoyer une remise pour la somme totale.

Agréez, Meassieurs,
Nos sincères salutations,
B ..... et Cie.
16. Translate into French and answer in French the following letter :-

Glasgow, Feb. 1lth, 1897.
Messrs. C . . \& Co., Lyons.
Gentlemen,
We have an enquiry for a better class of fringe, similar to enclosed pattern. If you can do this make well, and have any in stock, you might add one gross of 3 -inch to the next delivery of goods for us. But at any rate let us have a quotation of price, and a pattern, if possible, by return of post.

> Yours truly,

$$
\mathrm{R} \ldots \& \mathrm{Co}_{0}
$$

17. Translate :-
(a) Into French.-On joiut and equal account; to advertise largely; an accommodation bill; spirits in bond; homeward cargo; outward cargo; warehousing charges.
(b) Into English.-Traiter de gré à gré; une créance véreuse; marchandises renducs en gare; donner des arrhes; des lainages; le gulon d'or et le galon d'argent.

## FRENCH.

> Honours.-Second Paper.

## Saturday, 19th June. 10 A.m. to 1 P.m.

Candidates must, in all cases, answer Questions 1 and 2, and should attempt at least four (AND NOT MORe than six) of the remaining questions.

## Section I.

1. Translate :-
(a) On the 27th June, 1787, between the hours of eleven and twelve at night, I wrote the last lines of the last page in a summer house in my garden. After laying down my pen, I took several turns in a berceau, or covered walk of acacias, which commands a prospect of the country, the lake, and the mountains. The air was temperate, the sky was screne, the silver orb of the inoon was reflected from the waters, and all nature was silent. I will not dissemble the first emotions of joy on the recovery of my freedom, aud, perhaps, the establishment of my fame. But my pride was soon humbled, and a sober melancholy was spread over my mind, by the idea that I had taken an everlasting leave of an old and agreeable companion, and that whatsoever might be the future fatc of my listory, the life of the historian must be short and precarious. I will add a fact which has seldom occurred in the composition of six, or even of five, quartos. Not a sheet has been seen by any human eyes, excepting those of the author and the printer, the faults and the merits are exclusively my own.
(Gibbon.)
(b) There are no natural objects out of which nore can be learned than out of stones. They seem to have been created especially to reward a patient observer.

## (Ruskin.)

(c) On coming out of a sick room, it is not till we have established ourselves in the sitting-room, wheeled round the armchair to the firc, felt our appetite return and taken up a book, that we can be considered as restored to ourselves.
(W. Hazlitt.)

## Section II.

## Translate into English:-

(a) Tels ils étaient, tels ils sont encore. Ancun des traits de leur premier type ne s'est altéré. C'est toujours le même peuple errant, sans feu ni lieu, sens culte ni code, épars et identiqué à lui-même sur tous les sentiers du monde où it essaime ses noires caravanes. Il a gardé sa paresse rêveuse, sou iudépendance égoïste, son ignorance du bien et du mal, sa rébellion tenace aux lois du travail et de la contrainte. Aux autres les villes policées, les maisons solides, le foyer qui fonde, le champ qui enracine, la sécurité du bien-être, les travaux de l'intelligence. Au Bohême les fôrets toufiues, les sierras pierreuses les arches de ponts écroulés, la tente qu'on roule chaque matin autour du bâton de voyage.
(Paul de Saint-Victor: "Les Bohémiens.")
(b) Parlons un peu de M. de Turenne; il y a longtemps que nous n'en avons parlé. Ecoutez, je vous prie, une chose qui est à mon sens fort belle: il me semble que je lis l'histoire romaine. Saint-Hilaire, lientenant-général de l'artillerie, fit donc arrêter M. de Turenne, qui avait toujours galopé, pour lui faire voir une batterie ; c'était comme s'il eût dit: "Monsieur, arrêtez-vous un peu, car c'est ici que vous devez être tué." Le coup de canon vient done et emporte le bras de Saint-Hilaire, qui montrait cette batterie, et tue M. de Turenne. Le fils de Saint-Hilaire se jette à son père, et se met à crier et à pleurer. "Taisez-vous, mou enfant," lui dit-il: "voyez," en lui montrant M. de Turenne raide mort, "voilà ce qu'il faut pleurer éternellement, voilà ce qui est irréparable," et sans faire nulle attention sur lui, se met à crier et à pleurer cette grande perte. M. de la Rochefoucauld pleure luimême, en admirant la noblesse de ce sentiment.
(Mme. de Sévigné.)
(c) Mon rêve c'est d'aller, quand je serai très vieux,

Dans mon pays d'enfance où dorment mes aileux,
Vivre modestement dans une solitude;
D'y mener sans regret et sans inquiétude
Une existence calme et douce, en revoyant
Les bois et les vallons où je courais enfant ;
De m'asseoir aux beaux jours sur l'herbe des clairières,
Près des mêmes genêts et des mêmes bruyères,
Toujours comme autrefois prompt à m'énerveiller ;
Et d'entendre au lointain quelque ménétrier ${ }^{1}$
Marier, en jouant bourrée ${ }^{2}$ ou montagnarde, ${ }^{3}$
Mes rimes aux accords de sa vielle ${ }^{\text {chiarde. }}$
(Gabriel Marc.)
${ }^{1}$ village fiddler ; ${ }^{2}$ jig; ${ }^{3}$ Highland fling; ${ }^{4}$ hurdy-gurdy.

## Section III.

3. Give the lost forms of the old French adverb or (now conjunction), and all the modern French words of which it now forms a part, and translate :-

Or diet, nus l'orrum.
(Charson de Roland.)
Or sus, nous voilà bien !
Or çà, sire Grégoire, que gagnez-vous par an ?
(La Fontaine.)
4. Translate:-
(a) Vous voudriez me faire taire.
(b) Vous voulez me faire taire.
(c) Si j'avais dit un mot, vous étiez perdu.
(d) Je ne doute pas qu'il ne prétât l'oreille.
(Molitire.)
(e) Croyez-vous que vous fissiez mal d'aller une fois chezlui?
(Racine.)
And comment on the moods and tenses of the verbs used in the above texts.
5. Translate and write in modern French, and comment upon the syntax of the following sentences :-
(a) Le n'avoir point de mal, c'est le plus heureux bien estre que l'homnie puisse espérer.
(b) Priez pour moi l'oyseau Cyllenien, Guider mes pas jusqu'à tant que j'arrive.
(Du Bellay.)
(c) Nous craignons et honnorons Dieu purement ; Nous désirons son nom estre sanctifié.
(d) Et pour lier des mots si mal s'entraccordants, Prendre dans ce jardin la lune avec les dents.
(Boileau.)
(e) Quant Carles veit qui tuit sunt mort paien.
(Сh. de Roland.)
6. Give the derivation of métier, aigu, danger, aider, outrecuidance, ensemble, travailler, menu, dru, forge.
7. Trace the origin of the reflexive voice in French verbs, and account for the use of être in its componnd tenses. Explain its use in modern French, and give, with examples, the rules governing its past participle.

## Section IV.

8. Give, in French, a brief account, either of one of the tragedies of Corneille, Racine, or Voltaire; or of one of the comedies of Cornaille, Racine, or Molière; and state what titles the work you choose has to a permanent place in French literature.
9. State what you know of either Boileau's or Ste. Beuve's principles in literary criticism, and justify your statement by reference to their application of those principles.
10. State what you know of the "quarrel between the Ancients and the Moderns," in the seventeenth century, and trace its results in the subsequent periods of French literature.
11. State what you know of either V. Hugo's dramatic works, or Lamartine's poems, and quote any passage you know from them.
12. "Tel, comme dit Merlin, cuide engeigner autrui Qui souvent s'engeigne soi-même
(La Fentaine.)
Analyse the fable begimning with these two lines, or write a short essay in French demonstrating their truth.

Section V.
13. Write an essay, in French (not exceeding 40 lines), on one of the following subjects :-
(1) Your favourite pastime.
(2) English literature in the period best known to you.
(3) The period of French listory best known to you.
(4) The "heroes" of Corneille's Tragedies.
(5) The "heroincs" of Racine's Tragedies.
(6) "Quelle condition vous parait la plus délicieuse et la plus libre, ou du berger on des brebis? Le troupeau est-il fait pour le berger ou le berger pour le troupeau? Image naïve des peuples et du prince qui les gouverne, s'il est bon prince."
(La Bruyère.)

## GERMAN.

## Lower Grade.

Tuesday, 15 th June. 2 to 4.30 p.м.
To secure full marks, the whole of this Paper should be answered. Additional marks will be given for fair writing in the German character.

## Section I.

1. Translate into English :-

Bier $\mathfrak{T}$ age fpäter ritten bie Jremolitge wieber zur תontigifurg
 batte bie ftattliden Manner lieb geroonnen, und darum bot er ifnen fegt an, fic follten fith won ifm erfitten, was fie roollten, (bolo umb (bephmeibe, ober Mog und (bemano. Der alte Whate aber banfte uno ermiberte, fie bäten befien felfot genug; nur eines bitte or, DaÉ ber תönig mit feme: (bemaflin und Zodter nodi einmal ifige ©diffe beidatuen mödte, benn bag mürte ifnen eine grobe cefre fein. Dazu war 5agen gern bereit und berpuach arglog, am nädjfen Morgen nit feittem ganzen 5̧offtaate fie zu befucfen. M18 ber siönig um mit ben §rauen uno cinem glänzemben (Gefolge an baz̊ Whereşufer gefommen nar, hob man dic Frauen böflidit bon den Fofien, wio affe gingen nod ciumal yon $\mathfrak{B u b e} 弓^{3}$ Sube, prïften uno Gemuberten bic $\mathfrak{W a r e n}$ unt badten ant niftis $\mathfrak{B o f e s}$. Sobalo aber die fajone Silbe cins ber Wafrzenge betreten Gatte, gab wzate ona Seidfen, und plobglidy wimmelten alle Sdiffe bon geroappneten Diäntern, bie bibfer berforgen unter bent $\mathfrak{B e r b e f f e}$ gelegen Gatten. $\mathfrak{I n}$ eitum 2 uzenblife waren bie $\mathfrak{2 l n f e r}$
 maren griumtige Selten genorben, bie fatt bes eflenumáes baş blanfe
 unb feine 彐itter ifire ©dwerter, abor fifon waren bie Jremben bom Ufer afgeftofien, uno fein ©diff lag bereit, ifnen zu folgen. Jurditiar tobte ber alte Sagen, unb laut flagte bie Pönigin, ifre fotbone Tocfiter
 und fataute in bas milbe Dieer, tho menn fie ber eitern und ber liefen §eimat gebadte, trauerte fie fitterlidg. शber uidt fern bou ifr faß Der junge 5orand, griff in feine 5̧arfe und fang \&ied unt \&ied; und ale Siltbe bie Banfertōne wieter vernabm, crinnerte fie fid jence 2tbenos und ber Wुorte, bie ber ©anger gefproden Gatte, und Freube wio


> А. Bacueifter, "( Bubrum."
2. Translate into German (using the polite form of address, and giving the German of all the proper names) :-

There is somebody at the door, Mary ; see who it is.-It is Mr . Small, Miss Margaret.-Ask him to come in.-Good morning, Miss Hill, I hope you are quite well.-Yes, thank you, we are all in good health.-Are your brothers at lome?-I believe, Charles is working in his room, but William went yesterday to O 94790.

Newtown to visit his friend, James Green.-Will he be away long ?-1 fear he will not return till (say before) Wednesday or Thursday of next week. We expect a letter from him tomorrow or the day after.-I wish (say I would) he had told ne of his trip. My grandmother lives at Newtown, and I have long promised her a visit.-But can you not go after (say follow) him this afternoon or to-morrow morning? I am sure, my brother would be so glad to have you there, for his friend is in his business the greater part of the day.-Well, I'll see whether it is possible. I must first ask my parents.-As you have been there, you probably (rokl) know that neighbourhood (6egent) very well.-Oh, yes, 1 know every spot. But, if you allow me, I will now go up and speak to Charles for a minute.-Very well, you know where to (say where you will) find him.

## Section II.

3. Give the nominative and genitive singular and the nominative plural, with the definite article, of the German words for any ten of these :-eye, ear, hole, carriage, chair, pencil, leaf, cloud, river, neighbour, borly, fault, bird, eagle, goose.
4. Decline, singular and plural, the German for that woman, strong wind, and our dear friend.
5. Write out, in German :-5, 8, 15, 17, 21, 36, 54, 66, 179, 283 ; the 1st, 161h, 106th; $\frac{1}{4}, \frac{2}{3}$; on Saturday, the 6ith of March, 1897.
6. Write out:-
(a) The present and imperfect indicative of furedicn, wifien.
(b) The future perfect indicative of feir.
(c) The perfect indicative passive of Yoben.

## 7. Give--

(a) The 3rd person singular present, imperfect, and perfect indicative active of gefen, leben, cffen, burfen, thun, raten.
(b) The 2nd person singular imperfect subjunctive and imperative of fein, miffer, Gredfich, nelfmen, fenben, nennen.

## Section III.

8. Give the German for-for whom? with what? in whom? in what?-for that (therefor), in this (herein), over that; from me, for thee, with her, with them, without thein.
9. Form four sentences with prepositions that govern the genitive; and as many with prepositions that govern the accusative only.
10. Mention four verbs that form their compound tenses with the auxiliary fein; and four that form their past participles without ge=.
11. Mention three of ©đdiller'B, and as many of Lefitng's plays; and state what you know of the plot of one of each set.
12. Mention the titles of altogether six poems written by (Joctfe, Myland, and $\mathfrak{F}$ eine ; and, if possible, give the beginning of two of them.

## GERMAN.

Higher Grade and First Paper ror Honours Grade.

Tuesday, 15th June. 2 to 5 P.m,
Candidates must, in all cases, answer Questions 1 and 2, Section I.; and should attempt Eight questions (not more) from the other Sections.
Additional marks will be given for fair writing in the German character.

## Section I.-Transeation and Composition.

1. Translate into English:-
 umfyer und hatte beinatie bie (Srenze bes Randes erreitit, als er fidt itt
 fonute. (Er banb fein Bferb an einen Baum uno legte fidf baneben ins (3ras ; Demn er mar febr crmutbet, miuther von ben Befonwerlichfeiten ber Neife, ala pon bem innern Scelentampfe. Der Tudjfer in Nöten,
 einige Seit feinesi lugemadis bergejfen. Da fantelte ifn ploglide cime
 ermadte, fiel ify bie ©eftalt einess bagert alten Weifez ittz (beftot, bie
 Yenditete. Wei biefen umermarteten 2fnbliff uberlief ifn bic Saut mit cintem falten Sffauer ; er meinte, er fäfe cill ©efpemit. Dod berliés

 Die $\mathfrak{M}$ Ite antwortcte: „§ch Bin bie Siräterfrau der ©iguora Dottorena
 ifr תräuter uno Wiurzen zu fuđten, vou groEer Siraft und Wirfung, wofern fie in ber Mitternactiftumbe gegrabett merbert. Sid fand Eud auf meinem Wege und kielt ©udy für einen (Erfolfagemeu, ber unter bie Mörber gefallen wäre; barum riltelte unt fotuttelte id (Eutch, wu zu

 beiner (3ebicterin fern von Hier?"-Die Atte erviberte: "Sir \&anbhauß liegt bort im (5rumbe; ich fomme eben bon bater. ©o 95 r eine Madtberberge von ifr begefyrt, niro fie Eud foldye nidyt verfagen." Der Meifige, ber nady einem guten, gaftreunblicten Bette tradt tete, um ber nötigen Æube zu pflegen, zänute ungejäumt fein Bjerb unt rar Eereit, feiner Wegweijerin zu jolger.
= 2
b. תutze Seit Daraui Gatt' unfer Siflanzer 2tuf ber §ago im walbe fidid berirret. Hiber Stof unb Stein, burch Thal unt æäde Stieg er fodmer auf mandjen jäben zeljen, lum fidd umtrufeken nadi bent Wrabe, Der ifn tief in biefe wistronis bracfte. Dodf fein ©pätn unb Rufen war vergebens; Nidfute bernalim er als bas koffle (5dio Qange ben lyoten, fifmarzen Selfenwanben. 2ngitticit ging er bis zur zwarften ©tunte,
 Shod ein fleines, fifimatiees sidit erblifte. Furdit und §retbe folug in feinem 5erzen, Hio er fafte sinut mio nafte leife.
${ }^{\text {TSer }}$ ift braußen?" Grad) mit raukent Tone Eine ©timme tief ler aus ber §oble, Hib ein Mann trat aus ber fleinen Wobnung. "§reumb, im Walbe bab' id. mid verirret,"
 „(5obnet mir, bie Nadt Vier zuzubringen, Uno zeigt nad ber Stabt, id) werb' Euct banfen, Wiorgen frity mir bie gewiffen Wege."
2. (8). Scume.
3. Trauslate into Gierman :-

A gentleman, who had a large family and only a small iucome, took a house in the country, where he simply kept a housemaid and a coachman. After a time be was annoyed, almost every morning, by hearing these two quarrelling in the kitchen. At last, being unable to bear the disturbance any longer, he called the man and woman before him, reproached them with their objectionable behaviour, and asked the cause of it. The woman complained that she had far too much to do, and that the coachman, who had a pretty easy place, would not relieve (say assist) her by fetching the milk and cream from a farmhouse, which was a mile away. The coachman, in reply, maintained that it was not his business to fetch the milk, and that he had not been hired to do anything of the sort. "What do you consider your duty is?" asked the master. "My duty," replied the man, "is to clean the carriage, to see to the horses, and to drive." "You are quite right," said the gentleman, with a smile; "you understand your duty perfectly well, and shall do nothing beyond it; but I order you henceforth to get the horses and carriage ont every morning at seven o'clock, and to drive the maid to the farmer's for the milk." Ever afterwards the man went for the mill on foot without murmuring.

## Section II.-Grammar.

3. Give the nominative and genitive singular and nominative plural, with the definite article, of the German words for any ten of these :-judge, judgment, loss, fool, collar, colour, herald, trial, jewel, monument, nosegay, nobleman, spectre, corpse, vassal.
4. Distınguish between-baß̉ Mal, bas $\mathfrak{M a h l}$; bie Gduranfen, bie ๔duränfe; Das (seffnbe, bas (5iefinbel; bie Jeftigfeit, bie Jeftlitufeit; geiftig,
 iđđ freue midy barauf, iđø freue ulid barüber.
5. Mention six nouns that are used only in the plural ; and add the definite article to, and form plurals of-Danf, £ob, शat, $\mathfrak{I o b}$, ltuglüft, ણergnügen.
6. Show, by examples, under what conditions the pronominal adjectives meld, fold, aff, and mand) remain without signs of gender and case-form.
7. Give the 3rd person singular present, imperfect, and perfect indicative of tith beftumen, bolfbringen, fooctigalten, wiffafren, miğrauden; and the 2nd person singular imperative and the past participle of miberfipredien, vergeben, teifnefmen, Ioskaffen, ablejen.
8. Express in German :-What o'clock is it ? It is a quarter past twelve, half past two, a quarter to three; at ten o'clock; London, 3rd January, 1897; the reign of Charles the First ; in one hour and a half; in three years and a quarter; the armies of two nations ; the inbabitants of the two countries; with three horses.

Section III.-Phmology and Word-Formation.
9. Give five nouns in =1dfaft; five in =tum (two of them masculine, if possible) ; and two in =ridy. Add the deñnite article and meaning to each word.
10. What difference is there, in respect of formation, between the two abstract nouns Exvigfeit and Ecidtigfeit? Mention three other examples of each kind.
11. Form adjectives (with their meanings) from any ten of these :$\mathfrak{W a f f e r , ~ N u m f t , ~ 尺 e b e n , ~ g e n u g , ~ B l e i , ~ \Re u k ̨ e n , ~ B r a u t , ~ \Re a u f m a n n , ~ M i a b d j e n , ~}$ $\mathfrak{B e r t r a u e n , ~ M i c i f t r a u e n ~ ; ~ I o b e n , ~ r a t e n , ~ F t g e n , ~ a r f e i t e n . ~}$
12. Form abstract nouns (with the definite article and meaning) from any ten of these :- Feifer, minber, troden, ipariant, fromm, fofüdtern fawwer, ftor ${ }_{3}$, finfter, bereit, nage, unatt, warm, boble, begierig.
13. Give the German or English etymological equivalents of any ten of each of the following two sets of words ; adding, in each case, the exact meaning of the German word:-
(a) Cross, yoke, maid, luck, murder, nail, besom, need, hearth, path, plough ; to steal, to dream, to shove, to leap.



## Section IV.-Literature and Commerclal Correspondence.

## (Not more than two questions to be answered from this Section.)

14. Give some account of either the §ibelungen or (8ubrum.
15. State what you know of two of these writers:- UGlanb, भüffert, תörner, ફૂauff.
16. Give a short account of two of the literary schools of the 18 th, and beginning of the 19th, century.
17. Assign any twelve of the following works to their respective authors, characterising them in a single word (drama, epic, \&c.):Entilia ©ialotti. Turabod. Romanzero. Sriny. §phigenie auf Tautiê. Quintuß گixlein. Der Æing Des ફolnfrateş. Die §er= mannafdladt. Fortunat. Die ミuibomes. Dheron, תabale und \&iebe. Der Dbergof. Safifllieber, Triftat unt Solbe. Der fitb= zigfle (Seburtztag. Riefferfrübling. Der fliegenbe ફollanter.
18. Write, in German, to a commercial gentleman in Germany, who is a friend of your father, asking his advice as to what you had better do in order to acquire a thorough knowledge of fierman ; whether by attending for a time some commercial school, or entering some business.
19. Acknowledge receipt of an agent's letter, pointing out to him that the information he has sent is incomplete in regard to some branches of trade and industry, and impressing upon him the importance of keeping his eyes on the agents of rival firms.
20. Give some account, in German, of the German coinage, and the systems of weights and measures.

## GERMAN. <br> Honours.-Second Paper. <br> Saturday, 19th June. 2 to 5 p.m.

Candidates must, in all cases, answer Questions 1 and 2, Section I.: and should attempt elght questions (not more) from the other Sections.
Additional marks will be given for fair writing in the German character.

## Section I.-Translation and Composition.

1. Translate into Euglish:-
a. Go futr er im Jrūtyoumer finaug unter ben Glanen fimmel nuit ben zerflafteten, meigen, ziefgenben Wolfen in die flacte, märtifde Ramojifaft ظimein. Xber wie beimelte fie ign au! Der fandige
 rollte bas Gefäbrt babin, vorbei an ictmalen Wiefenftreifen, begrenzt
 bog ber Weg in ein Fiffteumälodien ein, zwififeu beffen ounfelbraumen Cotamuten gier und ba bie weipe Nimbe ubd bas Gelfe Raub einer Sirfe

 flog bann mit rauidjenben Simwingen über ben Weg, fith tiefer niegenb, als müfie er neugierig fefien, was feine Nube forte, wabrenb von fern ein תưfuaf feinen cintönigen Ruf eriduallen lieg.

2. Dentodis war langit bie Sumbe won bent ©dififal ber gropen \{irmee bis in bie entlegenfte §ütte georungen, zuerfit bunfle (Sieridite bon $\mathfrak{F o t}$ unb $\mathfrak{B e r l u f t}$, bann bie $\mathfrak{F a c t i f i d t}$ won cinem ungefeuern $\mathfrak{B r a n b e}$ in Mogfau unt ben Eimmelbogen תlammen, bie ringe un ben תaifer ans bem Boben geftiegen waren. Dann bon einer Jludit burd Eiz und 233 iffeneien, won §unger und unfigglidfent elent. Worfictig fprad) audif bas Bolf bariter, bem bie feinbe lagerten nidft nur in ber §auptfabt unb ben fefturgen Des \&anbces, fie katten auth in ben Brovinzen ifre ©päfer unb cerbapten Mngeber, benen ber Bürger aus bem 2 Bege ging. Seit ben leģten Tagen mugte man, bajg ber תaifer felfit won feinom §eer gefloben war. In offenem Sdjlitten, nur einen Begleiter neben fidt, war er verbült, als ફerzog von Bicenza, Tag mo Nadit burd) preupifaces (bebiet gefaliren.
©ufaw Frebtag.
 Uno byobjeliges stun, ala lieblide תrone bez wannes! Stefe, fürmabr, weit ebler benn (3olb und föflicte Berlen Ift ein tugendam Weib, - dc $\mathfrak{B}$ Yebt der Bejegnete länger! Thut eud Ricbes kinfort, thut, Simberden, ninmer eud Recibeß,
 ©ich midf an! Wir felfer berliepen io Water uno wiutter. Tutij bein Water ia madte fta fare und bie liebembe Witter, $2(t 8$ ung weit in bie Jremb' 2tgriefenben lange fic nadifatn,
 Stumm bamn fagen wir beibe, bie §anv' in einanber gefaltet,

 $\mathfrak{B i}$ bidf bas Wbort: „Dir fin itf bon nun an Bater und Wutter!"

3. Translate into German:-
a. This little excursion to Richmond was long remembered by these three. It was the last of their meetings before Sheila was ushered into the big world, to busy herself with new occupations and cares. It was a pleasant little journey throughout, for as they got into the laudau to drive back to town, the moon was shining high up in the southern heavens, and the air was mild and fresh, so that they had the carriage opened, and Sheila, well wrapped up, lay and looked around her with a strange wonder and joy as they drove underneath the shadows of the trees and out again into the clear sheen of the night. They saw the river, too, flowing smoothly down between its dark banks; and somehow here the silence checked them, and they hummed no more those tunes they used to sing at Borva. Of what were they thinking, then, as they drove through the silver night, along the lonely road ? The young husband, at least, was rejoicing at his great good fortune that he had securcd for ever to himself the true-hearted girl who now sat opposite him, with the moon-
light touching her face and hair; and he was laughing to himself at the notion that he did not properly appreciate her, or understand her, or perceive her real character. If not he, who then?

William Black, A Princess of Thule.
b. (1) I spoke to him about it, but he would not be advised.
(2) I know him only too well, he is net to be depended upon.
(3) She excused herself for having offended my wife.
(4) My landlord has not yet succeeded in letting his house.
(5) My brother beat the fellow, although he was ncarly twice his size.
(6) She was highly amused at my having taken the matter seriously.
(7) The pitcher may go to the well once too often..
(8) Don't make a mountain of a molehill.

## Section II.-Philology and Syntax.

3. Mention five pairs of adjectives (with the meanings) showing the difference of meaning attaching to the affixes =lidf and =ijif.
4. Give any adjectives in =fam you know, for which there are parallel adjectives in Euglish; and add six others in =fam which correspond to English adjectives derived from the same stem, but by other affixes.
5. Form verbs, with or without prefixes (not prepositions), from the
 bitter, gitig. Add the meaning to each verb.
6. Give the meaning, and explain the formation, of any ten of the following words, noting any irregularities in this respect:namentlid, fleflentlid), wabrgeitBgetreu, Wöglein, id ftürbe, (6rop̈=
 शach te, Tiutenfar, leiblyaftig, zufcyenoる, männiglity.
7. Show, by examples, to what German snunds the English dentals $t, t h, d$ usually correspond; and state whether a similar correspondence obtains in regard to the gutturals and labials.
8. Give the German for the following sets of words (each to be formed from the same radical word) :-to obey, obedient, obedience, to follow, the following (suite), consequence (sequel), consequently, compliant ; to write, the writ, scribe, writer (author); to sing, a song, singer, capable of being sung; to drink, a drink (draught), drink (beverage), drinker, drunk (intoxicated), drunkenness; true, truth, truthful, truthfulness, veracious; to envy, envy, envious.
9. Give idiomatic meanings (or, if possible, synonyms) of any ten of the following past participles:-berbrefien, berlegen, ungezogen, Gefonten, befdeiben, aufgelegt, befergt, befangen, eutfalofien, auggelaffer, Ketagt, entegt, unterthan ; and mention three others which (like angezogen) are only used negatively (with uns).
10. Give two distinct German words, with the definite article, for each of any ten of the following English homonyms (words with more than one distinct meaning) :-race, sentence, bank, capital, air, word, act, subject, row, match, party, column, step, habit, case.
11. Show, by examples, in what cases the Infinitive Active is used in German-(a) for the Present Participle Active; (b) for the Past Participle Passive; (c) for the Present Participle Passive; (d) for the Imperative.

## Section III.-Literature.

(Not more than three questions to be answered from this Section.)
12. State what you know of the $\mathfrak{M e i f f e r f i n g e r . ~}$
13. Name five poems of chivalry of the 12 th and 13 th centuries, with the names of their authors, and state what circles of legend they have to be referred to.
14. Explain in what respect Reffing may be called the father of the modern ferman drama, both as a critic and a playwright.
15. Mention six larger epic or romantic poems compcsed between the birth of תlopitodi and the death of (bbetfy ; and give some account of one of them.
16. State what you know of the lyrical poetry since the death of (boctbe.

## ARITHMETIC.

## Lower Grade.

Monday, 14th June. 10 A.m. to 11.30 A.Mr.
All the work must be shown, and such explanation added as is required to indicate the methods adopted.

Additional marks will be given for neatness, arrangement, and style.

1. Find, by practice, the dividend on $£ 7,12610 s$, at $9 s .6 d$. in the pound.
2. A bronze medal is composed of copper, tin and zinc. If $\frac{15}{18}$ of the medal be copper and $\frac{1}{9}$ be tin, what fraction of it is zinc?
3. A square paddock contains 16 square poles, and is enclosed by hurdles $2 \frac{3}{9}$ yards long. How many hurdles are required?
4. How many yards of paper, 27 inches broad, will be required to cover a wall $3 \frac{1}{2}$ yards high and $5 \frac{1}{4}$ yards broad?
5. Find the greatest common factor and the least common multiple of 336, 468 and 792.
6. Simplify-
(a) $\frac{\frac{2}{2 \frac{1}{4}}-\frac{1 \frac{3}{4}}{2}}{\frac{2}{2 \frac{1}{4}} \text { of } \frac{1 \frac{3}{4}}{2}} \div\left(\frac{2}{2 \frac{1}{4}}+\frac{1 \frac{3}{4}}{2}\right)$,
(b) $\frac{\frac{39}{713}}{\frac{55}{56} \times \frac{91}{115} \times \frac{24}{341}}$.
7. A picture, 18 inches broad and $10 \frac{1}{2}$ inches deep, is to be photographed on a reduced scale, so that the breadth of the photograph may be $7 \frac{1}{2}$ inches. Find the depth of the photograph.
8. Simplify-
(a) $(8 \cdot 47+\cdot 016-\cdot 0028) \times(\cdot 75+\cdot 075-\cdot 8125)$;
(b) $3 \cdot 4 \dot{3} 9 \dot{9} \div \cdot \mathbf{4} 3 \dot{5}$.
9. (a) Express • 0390625 of a day ( 24 hours) in minutes and seconds;
(b) If 8 metres are equal to 315 inches, express one metre as a decimal fraction of a yard.
10. In a school of 1200 the number presented for an examination was 20 per cent. of the whole, while the numbers passing in the first and second classes were respectively $12 \frac{1}{2}$ and $32 \frac{1}{2}$ per cent. of those presented. Find the number presented and the number passing in each class.
11. A customer deposits $£ 100$ in a bank on 31st January, $£ 150$ on 30 th April, and £125 on 31st July. What interest is due to him on 31st December, the rate being $2 \frac{1}{2}$ per cent. per annum, and one-twelfth of a y ear's interest being allowed for each calendar month ?

## ALGEBRA.

## Lower Grade.

## Monday, 14th June. 3 p.m. to 4.30 P.M.

All the work must be shown, and such explanation added as is required to indicate the methods adopted.
Additional marks will be given for neatness, arrangement, and style.

1. If $a=3, b=4, c=5$, find the values of-
(1) $\frac{a+b+\sqrt{a^{2}+b^{2}}}{\sqrt[3]{a^{3}+b^{3}+c^{3}}}$;
(2) $\{a-(b-c)\}\{b-(c-a)\}\{c-(a-b)\}$.
2. One of the factors of $8 x^{4}-12 x^{2}+21 x-5$ is $9 x^{2}+3 x-1$, find the other factor.
3. A dealer buys $a+b$ tons of hay, at $£(c-d)$ per ton, and $a-b$ tons at $£(c+d)$ per ton; if he sell the whole at $£ c$ per ton, what profit does he make?
4. Resolve into factors-
(1) $x^{3}-x^{2}-x+1$;
(2) $6 x^{2}-x-15$;
(3) $x^{4}+a^{3} a$
5. Simplify-
(1) $\frac{1}{a}+\frac{1}{a-b}-\frac{b}{a b-a^{2}}$,
(2) $\frac{10 x^{3}+13 x^{2}+7 x+15}{15 x^{3}+7 x^{2}+13 x+10}$.
6. Solve the equations-
(1) $\frac{3}{5}(7 x+11)-\frac{11}{7}(5 x-3)-\frac{2}{2}(13 x-8)=0$;
(2) $\frac{4}{x}=\frac{5}{x}\left(1-\frac{1}{x}\right)$;
(3) $a\left(\frac{1}{5} x-\frac{2}{3} c\right)-b\left(a+\frac{1}{3} x\right)+c\left(b+\frac{2}{3} a\right)=x\left(\frac{1}{3} c-\frac{1}{3} b\right)$.
7. Divide the number 23 into two parts such that the difference between their squares may be 161 .
8._Prove the identity -
$(b-c)^{3}+(c-a)^{3}+(a-b)^{3}=3(b-c)(c-a)(a-b)$.
8. Solve the equations-
(1) $\frac{10}{x-5}-\frac{9}{x+5}=4 \frac{1}{4}$;
(2) $\left\{\begin{array}{l}7 x-5 y=1, \\ 4 y-3 z=1, \\ 5 z-8 x=1 \text {; }\end{array}\right.$
(3) $\sqrt{3 x+4-} \sqrt{2 x+2}=\sqrt{x-6}$.
9. A motor car going at a certain rate for 10 miles, and at double that rate for the rest of the journey, takes 4 hours 40 minutes; but if it had gone at the faster rate for 10 miles and at the slower rate for the rest, it would have taken 6 hours 50 minutes. Find the two rates and the total length of the journey.

## GEOMETRY.

## Lower Grade.

Monday, 14th June. 12 noon to 2 p.m.
All ordinary symbols and contractions are allowed.
All the steps of the proofs must be given, and the previous propositions, etc., on which they depend should be indicated.

It is not necessary to write out the general enunciations of propositions, but the particular enunciations should be given.

Additional marks will be given for neatness, good style, and accurately drawn figures.

1. Give Euclid's postulates.

From a given point draw a straight line equal to a given straight line.
2. When two angles of a triangle are unequal, the greater angle has the greater side opposite to it.

In a triangle $A B C, A D$ and $A E$ bisect the interior and exterior augles at $A$, meeting $B C$ in $D$ and $E$, prove that $B A$ is greater than $B D$, and less than $B E$.
3. Triangles on equal bases and between the same parallels are equal in area.

The triangles $A B C$ and $D B C$, on opposite sides of $B C$, are equal in area, prove that $A D$ is bisected by the line $B C$.
4. Describe a parallelogram equal to a given polygon, having a side equal to a given straight line and an angle equal to a given angle.
5. If a straight line be bisected and divided internally at any other point, the sum of the squares on the unequal segments is double the sum of the squares on half the line and on the line between the points of section.
$P Q R$ is an acute-angled triangle, and $Q R$ is bisected in $O$, prove that $P Q^{2}+P R^{2}=2 P U^{2}+2 Q O^{2}$.
6. Find the centre of a given circle.
$P$ and $Q$ are the mid points of two parallel chords of a circle, show that the line $P Q$ passes through the centre.
7. The straight line drawn perpendicular to the diameter of a circle from its extremity touches the circle, and any other straight line through the same extremity cuts the circle in one other point.
8. If from a point without a circle two straight lines be drawn to cut the circle, the rectangles contained respectively by the whole lines and the parts of them without the circle are equal.

A point $O$ is taken 13 inches from the centre of a circle whose radius is 5 inches; a circle with centre $O$ and radius 9 inches, cuts the given circle in $P ; O P$ produced cuts the circle again in $Q$; find the length of $O Q$, and also the length of the tangent drawn from $O$ to the given circle.
9. Construct a triangle having given the base and the lengths of the perpendiculars to the opposite sides from the extremities of the base.
How many different triangles may in general be described to satisfy the given conditions?

Is there any restriction on the lengths of the given lines? If so, state it.

ARITHMETIC.<br>Higher Grade.<br>Monday, 14th June. 10 A.m. to 11.30 A.m.

All the work must be shown, and such explanation added as is required to indicate the methods adopted.

Additional marks will be given for neatness, arrangement, and style.

1. Find the values of-
(1) $\frac{13}{\frac{1}{5}}$ of 3 furlongs, 4 chains, 3 yards, 2 fect.
(2) $1 \cdot 9375$ of 10 cubic yards.
2. $A$ can do a piece of work in 14 days of 9 hours, and $B$ can do the same piece in 12 days of 7 hours. How long will they take to do it, working together for 8 hours a day ?
3. Give the two rules for the determination of leap year.

On what day will a child, born 1st June, 1897, have lived exactly 4000 days?
4. The average passenger fare on a railway is $1 \frac{1}{4} d$. a mile, the average journey is 12 uniles, and the average weekly revenue is $£ 710306$. Find the average number of passengers in a week.
5. Simplify the expressions-
(1) $\left(\frac{4844}{5536}+\frac{7623}{8316}\right) \div 1 \frac{19}{29}$.
(2) $\cdot 6 \dot{19} \dot{9} \dot{6} \times 9.68 \dot{7} \dot{2} \times 20.8 \dot{3}$.
6. The sum of $£ 1896 s .9 \mathrm{~d}$. is to be divided between 7 men, 11 women, 5 boys, and 6 girls, so that for every 5 s. a man receives a woman may get $2 s .11 \mathrm{~d}$., and for every 3 s . 6 d . a woman receives a boy may get $2 s .6 d$. and a girl $1 s .6 d$. Find how much cach person receives.
7. What sum will amount to $£ 8,33418 s$. in 3 years at 5 per cent. compound interest?
8. A square enclosure is surrounded by a roadway whose breadth is one-eleventh of the side of the enclosure. The area of the roadway is 1 acre, 2 roods, 28 square poles, 5 square yards. Find the length of the side of the enclosure in feet.
9. A man invests in Government stock paying $2 \frac{3}{4}$ per cent. interest, and finds that after paying $6 d$. in the pound income tax, his net income is exactly $2 \frac{1}{2}$ per cent. of the sum invested. At what price did he purchase the stock ?

## ALGEBRA.

## Higher Grade.

Monday, 14 th June. 3 p.m. to 4.30 P.m.
All the work must be shown, and such explanation added as is required to indicate tbe methods adopted.

Additional marks will be given for neatness, arrangement, and style.

1. Simplify-

$$
\begin{gathered}
(a+b+c)\left(\frac{b+c-a}{b c}+\frac{c+a-b}{c a}+\frac{a+b-c}{a b}\right)- \\
\frac{b+c-a}{a} \cdot \frac{c+a-b}{b} \cdot \frac{a+b-c}{c} .
\end{gathered}
$$

2. Solve the equations-
(1) $(a-c)(b x-1)=(a-b)(c x-1)$;
(2) $\left\{\begin{array}{l}x-y+z=8, \\ x+\frac{1}{2} y-z=\frac{1}{3} x-\frac{1}{2} y+\frac{1}{5} z=0 .\end{array}\right.$
3. If $x^{3}+3 x^{2}-9 x+c$ be the product of three factors, two of which are identical, prove that $c$ is either 5 or -27 , and find the factors in each case.
4. Solve the equations-
(1) $\frac{1}{x}-\frac{1}{x-a-b}=\frac{1}{a}+\frac{1}{b}$;
(2) $\left\{\begin{array}{l}x^{2}+y+z=21, \\ x^{2}+y z=22, \\ x^{2} y z=96 ;\end{array}\right.$
(3) $\sqrt{x^{2}+x+4}+\sqrt{x^{2}-x+3}=2 x+1$.
5. $A$ walks a quarter of a mile in an bour farther than $B$, and in consequence takes a quarter of an hour less time to walk 15 miles. Find the rate at which each walks.

Explain the negative results.
6. The weights of two men are as 12 to 11 ; a year later they have gained additional weight in the proportion of 18 to 1 , and their total weights are now as 29 to 24 . If the heavier man now weighs 12 stone 6 lbs., find his original weight.
7. If $a+\sqrt{ } b=c+\sqrt{ } d, a$ and $c$ being rational quantitics, and $\sqrt{ } b$ and $\sqrt{ } d$ proper surds, prove that $a=c$ and $b=d$.
Simplify $\frac{4+\sqrt{ } 2}{2+\sqrt{ } 2}+\frac{4-\sqrt{ } 2}{3+\sqrt{ } 2}+\frac{9 \sqrt{ } 2-13}{3-\sqrt{2} 2}$.
Find the square root of $7(3+2 \sqrt{ } 2)$.
8. Prove that $x^{\frac{m}{n}}=\frac{m p}{n p}$, stating carefully what you assume. Hence, or otherwise, find a rational quantity which can be divided, witlout remainder, by $x^{\frac{1}{1}}+y^{\frac{1}{2}}$.
9. Write down expressions for the sum of $n$ terms of (1) arithmetical, (2) a geometrical series, whose first and second terins are $a$ and $b$.

If the fourth term of a progression be 1 , and its 7 th term be $\frac{1}{\frac{1}{8}}$, find the sum of 10 terms, (1) when the series is arithmetical, (2) when it is geometrical.

## GEOMETRY.

## Higmer Grade.

Monday, 14th June. 12 noon to 2 p.x.
All ordinary symbols and contractions are allowed.
All the steps of the proofs must be given, and the previous propositions, \&c., on which they depend should be indicated.

It is not necessary to write out the general enunciations of propositions, but the particular enunciations should be given.

Additional marks will be given for neatness, good style, and accurately drawn figures,

1. The complements of the parallelograms which are about a diagonal of any parallelogram are equal.
$A B C D$ is a parallelogram, and $A P Q R, Q S C T$ are parallelo. grams about the diagonal $A C$; show that their difference is equal to twice the triangle $Q B D$.
2. Prove that a quadrilateral which is bisected by both its diagonals must be a parallelogram.
3. Describe a square which shall be equal to a given rectilineal figure.
4. Angles in the same segment of a circle are equal.
$A, B, C$ are points in the same straight line, and $O$ is another point; perpendiculars drawn from $A, B, C$ to $O A, O B, O C$ in the plane $O A B C$ intersect in $L, M, N$; show that $L, M, N, O$ are concyclic.
5. Construct a triangle having each of the angles at the base double the vertical angle.
Construct a triangle having each of the angles at the base seven times the vertical angle.
6. Prove that every equilateral polygon inscribed in a circle is also equiangular.
7. If two triangles be equiangular they shall be similar, those sides being bomologous which are opposite equal angles.
$A B C$ is a triangle, and $P$ is a point on its circumscribed circle, $A Q$ is drawn parallel to $C P$ to meet $B C$ (produced if necessary) in $Q$; show that the rectangle $A B . A C$ is equal to the rectangle $A Q . B P$.
8. If the exterior vertical angle of a triangle be bisected by a straight line which also cuts the base produced, the ratio of the external segments of the base shall be equal to the ratio of the sides of the triangle.
$A$ is a fixed point in an indefinite straight line, $P$ a variable point in the same line, $S$ an external point, $S R$ is drawn perpendicular to $S A$ to cut the given line in $R$; prove that (1) the ratio $S P: P A$ is never less than $S R: R A$, (2) a point $P^{\prime}$ can generally be found in the given line such that $S P^{\prime}: P^{\prime} A$ $=S P: P A$.
9. In the tetrahedron $A B C D, A B, A C$, and $A D$ are equal. Show that the centre of the circumscribing sphere lies in the perpendicular drawn from $A$ to the plane $B C D$.

## ELEMENTARY TRIGONOMETRY AND LOGARITHMS.

## Higher Grade.

Friday, 18 th June. 10 A.y. to 11.30 A.m.
All ordinary symbols and contractions are allowed.
Additional marks will be given for neatness, good style, and accurately drawn figures.

1. Prove that the ratio of the radius to the circumference of a circle is constant.
2. Show that the tangent of an angle can have any value positive or negative.

Is this true of any other trigonometrical ratio? Give reasons for your answer.
3. Prove the identities:-
(1) $\cos ^{4} A+\cos ^{2} A \sin ^{2} A+\sin ^{2} A=1$,
(2) $\frac{1+\sin A}{\sec A+1}+\frac{1-\sin A}{\sec A-1}=2 \cot A(\operatorname{cosec} A-\cos A)$.
4. Prove geometrically, and as generally as you can, one of the following identities :-
(1) $\sin (A+B)=\sin A \cos B+\cos A \sin B$,
(2) $\cos (A+B)=\cos A \cos B-\sin A \sin B$.

Deduce the identity :-

$$
\frac{\cos (A+B+C)}{\cos A \cos B \cos C^{\prime}}+\tan B \tan C+\tan C \tan A+\tan A \tan B=1
$$

5. Prove that

$$
\tan \theta=\frac{\sin 2 \theta}{1+\cos 2 \theta^{\prime}},
$$

and hence find $\tan 15^{\circ}$.
Verify your resuit by a simple geometrical construction.
6. Prove the following relations among the sides and angles of a triangle :-
(1) $a^{2}+b^{2}-c^{2}=2 a b \cos C$,
(2) $a \cos B \cos C+b \cos C \cos A+c \cos A \cos B=\frac{a b c}{4 R^{2}}$,
where $R$ is the radius of the circumscribing circle.
7. A man, on the top of a cliff by the sea, observes a sinall boat on the horizon, and finds that the angle of depression of the boat is $\alpha$. If $r$ be the radius of the earth, show that the height of the cliff is $r(\sec \alpha-1)$, and the distance of the boat is $r \tan \alpha$.
8. Show that $\log \left(x^{n}\right)=n \log x$, and hence solve the equation $(1 \cdot 085)^{n}=2$.

To what problem in interest does your result give the answer ?
9. Prove the formula

$$
\tan _{2}^{A} \frac{B-C}{2}=\frac{b-c}{b+c}
$$

If, in the triangle $A B C, b=71, c=29$, and $B-C=90^{\circ}$, find the third side and all the angles.

## ALGEBRA.

## Honours Grade.

## Monday, 14th June. 3 p.m. to 4.30 P.m.

All the work must be shown, and such explanation added as is required to indicate the methods adopted.

Additional marks will be given for neatness, arrangement, and style.

1. If $y=\frac{a x+b}{c x+d}, z=\frac{a y+b}{c y+d}, x=\frac{a z+b}{c z+d}$
for all values of $x$, then

$$
a^{2}+b c+a d+d^{2}=0
$$

2. Solve the equations
(1) $a x+a^{2} y+a^{3} z=1$, $b x+b^{2} y+b^{3} z=1$, $c x+c^{2} y+c^{3} z=1 ;$
(2) $(x+y)^{2}+y^{2}=106$,
$x^{4}+4 y^{4}=2756$.
3. Find the condition that the equations

$$
x^{2}+p x+q=0
$$

should have a common root.

$$
x^{2}+p^{\prime} x+q^{\prime}=0
$$

Show that your result is equivalent to the identity
$(\alpha-\gamma)(\alpha-\delta)(\beta-\gamma)(\beta-\delta)=0 ;$
where $(\alpha, \beta),(\gamma, \delta)$ are the respective pairs of roots of these equations.
4. Define proportion and continued proportion.

If $a, b, c, d$ are in proportion, determine $x$ and $y$ so that $a+x$, $b+x, c+y, d+y$ may be in continued proportion.
5. When are numbers said to be in harmonic progression ?

Four numbers are in harmonic progression; the first, third, and fourth are in geometrical progression; the sum of all four is one hundred. Find the numbers.
6. Prove the formula for the number of selections (combinations) of $n$ different things taken $r$ together.

In how many ways can $a$ white balls and $b$ black balls be placed in a row, so that no two black ones are adjacent, $a$ being not less than $b+1$ ?
7. Explain under what circumstances the expansion of $(1+x)^{n}$ will have a greatest term, $n$ not being a positive integer.

Find which is the numerically greatest term in the expansion of
(1) $(1+x)^{174}$ when $x=\frac{3}{4}$,
(2) $(1+x)^{-10}$ when $x=\frac{2}{3}$.
8. Explain the graphic representation of a complex quantity: and show how to represent graphically any integral power of such a quantity : e.g. $(a+b i)^{n}$.
9. A number $n$ of travellers set out on an exploration, and each can carry supplies for one person for $a$ days. Show that, assuming the supplies to be uniformly consumed, the furthest distance it is possible to reach for all to return safely is $n a /(n+1)$ days ${ }^{*}$ journey, and that the travellers must return one by one at intervals of $a /(n+1)$ days.

## GEOMETRY.

## Honours Grade.

## Monday, 14th June. 12 noon to 2 p.M.

All ordinary symbols and contractions are allowed.
All the steps of the proofs must be given, and the previous propositions, \&c., on which they depend should be indicated.
Additional marks will be given for neatness, good style, and accurately drawn fignres.

1. Divide a given straight line so that twice the rectangle contained by the whole line and one part shall be equal to the square on the other part.
2. If the opposite angles of a quadrilateral are supplementary, prove that the vertices lie on the circumference of a circle

A point $O$ is taken within an equilateral triangle $A B C$, and $O P, O Q, O R$, are drawn perpendicular to the sides. Prove that

$$
Q R: R P: P Q=O A: O B: O C .
$$

3. If two faces of a tetrahedron are equal in area, then the shortest distance between their common edge and the opposite edge bisects the latter.
4. Show that any transversal parallel to one ray of a harmonic pencik has equal parts intercepted between the other three.
Three collinear points $A, B, C$, heing given, determine a point $D$, that, with them, completes a harmonic range; and show clearly how many solutions there are.
5. From a point $P$ on the circumscribing circle of a triangle $P X, P Y$, $P Z$ are drawn perpendicular to the respective sides $B C, C A$, $A B$. Prove that $X, Y, Z$ are collinear.
Show that the line $Y Z$ is greatest, for all positions of $P$, when $A P$ is a diameter.
6. If $I$ be the inscribed and $J$ an escribed centre of a triangle $A B C$, and $A I J$ cuts the side $B C$ in $P$ and the circumscribing circle in $X$, prove that $X I^{2}=X J^{2}=X P \cdot X A$.

Hence, or otherwise, show that if $H / K, L J M$ be drawn parallel to $B C$ to cut $A B$ in $H, L$, and $A C$ in $K, M$, the circles on $H L$, $K M$ as diameters touch in $X$.
7. Prove that the three perpendiculars of a triangle meet in a point.

Prove that the line joining this point to the mid-point of any side, and produced to meet the circumscribing circle, is bisected where it meets the side.
8. Define the limiting points of a system of co-axial circles.

If these are given, show how to find the two circles of the system that have a given radius.
9. Explain the principle of inversion.

Prove that if the nine points circle be inverted with reference to the mid-point of one side, the inverse will be a straight line anti-parallel to that side with respect to the other two.

# TRIGONOMETRY AND LOGARITHMS. 

## Honours Grade.

Friday, 18th June. 10 A.m. to 11.30 A.m.
All ordinary symbols and contractions are allowed.
Additional marks will be given for neatpess, good style, and accurately drawn figures.

1. Draw curves showing the variations in $\sin \theta$, in $\sin 2 \theta$, and in $\cos 2 \theta$, as $\theta$ increases in value from zero to $2 \pi$ radians.

By the aid of your diagram show that when $\sin 2 \theta$ is given, $\sin \theta$ may have one of four different values, but if $\cos 2 \theta$ is given, $\sin \theta$ may have one of only two different values.
2. If all the following angles are acute, and $\sin \theta=\cos \phi \cos \beta$, and $\sin \phi=\cos \theta \cos \alpha$, then $\sin \alpha=\tan \theta \tan \beta$, and $\sin \beta=$ $\tan \phi \tan \boldsymbol{\alpha}$.
3. Prove for all values of $A$ and $B$ the identity

$$
\cos (A+B)+\cos (A-B)=2 \cos A \cos B
$$

If $17 \theta=2 \pi$, show that

$$
\begin{aligned}
& \cos \theta+\cos 2 \theta+\cos 3 \theta+\ldots+\cos 16 \theta \\
& \quad=16 \cos \theta \cos 2 \theta \cos 4 \theta \cos 8 \theta
\end{aligned}
$$

4. If $A+B+C=180^{\circ}$, prove that
$\sin ^{2} A+\sin ^{2} B-\sin ^{2} C=2 \sin A \sin B \cos C$; and hence show how to obtain the angle $C$, in a triangle $A B C$, in terms of the sides.

Within a triangle $A B C$, a poiut $P$ is taken such that each side subtends at P an equal angle; prove that

$$
\frac{A B^{2}-A C^{2}}{P B-P C}=\frac{B C^{2}-B A^{2}}{P C-P A}=\frac{C A^{2}-C B^{2}}{P A-P B}
$$

5. What kind of formulæ are best adapted to logarithmic computation ?

Show how to find the third side of a triangle, in which $a, b, C$, are given by a formula thus adapted.

If $a=17305, b=28194, C=63^{\circ} 15^{\prime}$, find $c$, using such a formula, or otherwise.
6. The summits of two distant hills of equal height are known to be one mile apart, and the line joining them lies north and south. An observer at the same height notes that the nearer hill lies $\theta^{\circ}$ west of north, and placing his stick, which is $a$ inches long, in such a position that its extremities just cover the summits, he finds that his eye is $b$ inches from each end. Find the distance of each hill from the observer.
7. Find expressions for the radii of the escribed circles of a triangle.

$$
\text { If } r_{1}, r_{2}, r_{3} \text {, be these radii, show that the sides are given by }
$$

$$
a \sqrt{r_{2} r_{3}+r_{3} r_{1}+r_{1} r_{2}}=r_{1}\left(r_{2}+r_{3}\right), \text { etc. }
$$

8. Assuming Demoivre's theorem, prove that

$$
e^{\theta_{i}}=\cos \theta+i \sin \theta
$$

A line $O A$ is drawn of any length, $A B$ is taken equal, and at right angles, to $O A ; B C$ equal, and at right angles, to $\frac{1}{2} A B$; $C D$ equal, and at right angles, to $\frac{1}{3} B C$, and so on, always turuing in the same direction. Prove, from the above result, or otherwise, that the ultimate position of the extremity $P$ of the last side of the figure constructed is on the circle whose centre is $O$, and radius $O A$, and that the are $A P$ is equal to the radius.
9. (1.) Sum the series

$$
\tan ^{-1} \frac{1}{3}+\tan ^{-1} \frac{1}{7}+\tan ^{-1} \frac{1}{13}+\ldots+\tan ^{-1} \frac{1}{n^{2}+n+1}
$$

Prove that, when $x$ is less than unity,

$$
\begin{gather*}
1+x \cos \theta+x^{2} \cos 2 \theta+\ldots \text { to infinity }  \tag{2.}\\
=\frac{1-x \cos \theta}{1-2 x \cos \theta+x^{2}}
\end{gather*}
$$

From this result deduce the expansion of $\cos n \theta$ in terms of $\cos \theta$.

## ELEMENTS OF DYNAMICS.

## Additional Mathematical Subject.

## Friday, 18th June. 2 P.M. to 3.30 p.M.

All the steps of the proofs must be given, and the work of the calculations should be shown in full. Additional marks will be given for neatness, good style, and accurately drawn figures.
The acceleration due to gravity may be taken as 32 feet per second per second.

1. Enunciate and prove the proposition known as the Triangle of Velocities.
$A B C$ is an equilateral triangle and velocities represented in magnitude and direction by $3 A B, 2 B C$, and $C A$ are imparted simultaneously to a particle; show that its resultant velocity is represented by twice the perpendicular from $A$ to $B C$.
2. Show how to resolve a given velocity into two components at right angles to each other.

A ship is sailing in a direction between east and north at the rate of 13 knots; if the easterly component of its velocity be 12 knots, find the northerly component.
3. Define force and momentum. How is force related to momentum?

A roller weighing 10 ewt. is moving at the rate of 2 miles an hour ; compare its momentum with that of a cannon-ball weighing 16 lbs ., and travelling at the rate of 1,232 feet a second.
4. Show that a body projected obliquely under the action of gravity will describe a curved path.
A cricket ball is thrown in a direction making an angle of $60^{\circ}$ with a horizontal plane, its initial velocity being 100 feet per second ; find its velocity at its highest point (the resistance of the air being neglected). Find also how many seconds the ball will take to reach a vertical wall 50 yards in front of the thrower.
5. If two unequal parallel forces act at given points of a body in opposite directions, find the magnitude and line of action of a third force which shall be in equilibrium with them.

A lever is 8 feet long; one end is used as fulcrum, and an upward force equal to the weight of 10 pounds is applied to the other in order to raise a waight of 32 pounds. Find at what point of the lever the weight is suspended.
6. Define work, and explain how it is measured.

In the system of pulleys in which one string goes round all the pulleys, show that the work done by gravity on the power as it descends a given distance is equal to the work done against gravity in the accompanying ascent of the weight.
7. Explain how the pressure at a given depth below the surface of a liquid is measured.

The pressure of the air on the surface of the sea is 15 lbs . on the square inch, and a cubic foot of sea-water weighs 1,025 ounces; find the pressure at a depth of 768 yards,
8. Describe a pump for forcing air into a closed vessel.

If the pump is connected with the pneumatic tyre of a bicycle by a short tube, show clearly that each stroke forces in less air than the preceding stroke.

## HIGHER DYNAMICS.

## Additional Mathematical Subject.

## (Higher Grade and Honours.)

Friday, 18th June. 2 p.m. to 3.30 p.m.
All the steps of the proofs must be given, and the work of the calculations should be shown in full.
Additional marks will be given for neatness, good style, and accurately drawn figures.
The acceleration due to gravity may be taken as 32 feet per second per second.

1. Define the moment of a force about a point.

Prove that the sum of the moments of two forces represented by $A B, A C$, about any point $O$, is equal to the moment of their resultant about the same point.
2. State the conditions of equilibrium of a body acted upon by three forces.

The legs of a double step-ladder, whose weight may be neglected, are each 10 feet long, and are joined by two strings, each 5 feet long, and on each side attached to points $6 \frac{1}{2}$ feet from the top. A man, whose weight is 12 stone, stands on the top. Find the tension of each string if the floor be smooth. If the floor be rough, and the strings be removed, find the greatest angle at which the ladder can be opened when the man is at the top.
3. A heavy body is placed on a table, with three vertical legs, at the centre of the circle circumscribing the triangle $A R C$ formed by the points of insertion of the legs. Prove that the additional pressures sustained by the legs are in the ratios $a \cos A: b \cos B: c \cos C$.

Examine whether, if a table have four vertical legs at the corners of a square, and the body be placed at the centre, the additional pressures will be necessarily equal.
4. Apply the principle of work to find the connection between the power and the weight in the case of (1) the inclined plane, (2) the wheel and axle.
A man, weighing 11 stone, rides a bicycle geared to 66 inches (i.e., each revolution of the crank propels the bicycle a distance equal to the circumference of a circle whose diameter is 66 inches) and of weight 35 pounds. If the crank-arm is $6 \frac{3}{4}$ inches long, and if he puts his whole weight on the pedal, show that the steepest hill on which he can keep his bicycle at rest will have an inclination of one in six. In what position must the crank be ?
5. Prove and explain the formulæ $v^{2}=V^{2}+2 g s, 2 s=(V+v) t$.

Prove that the time of falling down all chords of a vertical circle to its lowest point is the same.

Is this true if the plane of the circle be inclined ?
6. Find the acceleration to the centre under which a particle will describe a circle of radius $r$ with velocity $v$.

A shot is fired in a horizontal direction : assuming that there is nothing in the way, find its velocity in feet per second in order that it may just travel round the earth, whose radius is 3,960 miles.
7. Prove that the path of a body moving under the action of gravity is a parabola.

Find the direction in which a body must be projected with initial velocity of 1,600 feet per second, in order to hit a mark at a horizontal distance of 7 miles and 3,040 feet.
£. Define resultant pressure and centre of pressure.
Find the position of the centre of pressure on the bottom of a rectangular bath 20 feet long, 10 feet wide, 4 feet deep at one end, and 6 feet deep at the other, the bottom being an inclined plane.
9. What is "Boyle's Law"?

Show that if a partially filled balloon be released and begin to ascend, it will rise with constant acceleration until it becomes full through the expansion of the contained gas, when the acceleration will begin to decrease.

Is this last result true, whether the neck of the balloon be open or closed?

## GEOMETRICAL CONICS.

Additional Mathematical Subject.

(Higher Grade and Honours.)
Friday, 18th June. 4 p.m. to 5.30 P.M.
All ordinary symbols and contractions are allowed.
All the steps of the proofs must be given, and the previous propositions, $\& c$., on which they depend should be indicated.

Aadditional marks will be given for neatness, good style, and accurately drawn figures.

1. Distinguish between the three classes of conic sections.

If an ellipse, a parabola, and a hyperbola have the same focus $S$ and the same directrix, and if a line drawn from $S$ meet the ellipse in $E$, the parabola in $P$, and the hyperbola in $H$, show that $S H>S P>S E$.
2. $A$ is the vertex of a parabola, and from $P$, any point in the curve, $P M$ is drawn at right angles to the directrix, $P A$ produced meets the directrix in $K$; show that $M S K$ is a right angle.
3. Find the locus of the foot of the perpendicular from the focus on the tangent to the parabola.
Two parabolas have the same focus $S$, and tangents are drawn to both parabolas at their vertices, meeting in $T$. Show that a straight line through $T$ perpendicular to $S T$ will touch both parabolas, and find the points of contact.
4. If perpendiculars are drawn from the foci of a central conic to a tangent, the rectangle contained by the perpendiculars is equal to the square on the semi-axis minor.
5. State the fundamental property of conjugate diameters in an ellipse, and prove that supplemental chords are parallel to two conjugate diameters.

From $P$, any point in an ellipse, $P N$ is drawn perpendicular to a fixed diameter $D E$. Show that $P N$ is a maximum when $C P$ is conjugate to $C D$.
6. In the hyperbola the portion of any tangent intercepted between the asymptotes is bisected at the point of contact.

Define a rectangular hyperbola, and prove from the definition that if $A, A^{\prime}$ are the vertices, and $P$ any point on the curve, the ordinate $P N$ is a tangent to the circle through $A, A^{\prime}$ and $P$.
7. If a right cone be cut by a plane which is parallel to a generating line of the cone and at right angles to the plane containing that line and the axis of the cone, the section is a parabola.

Show that the latus rectum of a parabola cut from a given cone varies as the distance between the vertex of the parabola and the vertex of the cone.

## ANALYTICAL GEOMETRY.

## Additional Mathematical Subject.

(Higher Grade and Honours.)
Friday, 18th June. 12 noon to 1.30 p.m.
All the steps of the proofs must be given. Additional marks will be given for neatness, good style, and accurately drawn figures.

The co-ordinate axes may be assumed to be rectangular throughout.

1. Find the area of the triangle formed by joining the points $(63,36)$, $(15,0),(0,20)$.

Prove that this triangle is right angled.
2. Show that $y=m x+c$ is the equation to a straight ine, and determine the significance of $m$ and $c$.
Form the equation to the straight line drawn through the point $(h, k)$ at right angles to the line $y=m x+c$, and obtain the co-ordinates of their point of intersection.
3. Determine the condition that three straight lines meet in a point.

Find what value $p$ must have in order that the straight lines $p x+4 y=6,3 x+4 y=5,2 x+3 y=4$, may meet in a point.
4. Form the equation of the circle which passes through the points $(2,1),(0,3),(2,5)$, and find the co-ordinates of its centre and the length of its radius.
5. Find the co-ordinates of the point which divides in a given ratio the line joining two given points.
$P$ is any point on the curve $x y=a^{2}, A$ is a fixed point $(-a, 0)$ find the equation to the locus of a point that divides $A P$ in the ratio $m: n$.
6. Transform the equation $\left(a^{2}+b^{2}\right)\left(x^{2}+y^{2}\right)+2\left(a^{2}-b^{2}\right) x y=2 a^{2} b^{2}$ to axes bisecting the angles formed by the original axes, and reduce it to its simplest form.
7. Obtain the equation to the tangent at any peint of a circle.

If from $(h, k)$ any line be drawn cutting the circle $x^{2}+y^{2}=a^{2}$, the tangents at the point where it meets the circle will intersect on the line $h x+k y=a^{2}$.

## BOOK-KEEPING.

Wednesday, 16th June. 2 p.m. to 4.30 P.m.
Walter Long commenced business on 1st December, 1896, with :-


The following were his transactions during December, 1896 :-


Write $5 \%$ per annum off Premises ( $=£ 43 s .4 d$.) and $10 \%$ per annum off Furniture ( $=16 \mathrm{~s} .8 \mathrm{~d}$.) for depreciation, and allow John Scott interest at $4 \%$ per annum ( $=£ 2$ ). The stock of coal on hand at 31 st December, 1896, is valued at $1,044 l$.

Record the opening entries, the above transactions, and the closing entries, including the entries for framing a Profit and Loss Account, in Journal, Cash Book, Invoice Book, and Day Book. Only journalize the entries which are not suitable to enter in the other books.

Post all the entries to Ledger Accounts. Separate Accounts should be opened for each class of expenditure.

Frame a Profit and Loss Account, and carry the balance to Walter Long, Capital Account. Then frame a Balance Sheet.

The Balances (or balancing entries) should all be filled in and the Accounts closed and ruled off.

Find the rate per ton at which the coal is taken at 31st December, 1896, and show how the books can be kept to show the stock on hand.

## commercial arithmetic.-First Paper.

Thursday, 17th June. 2 P.M. to 2.30 p.m.
This paper will be taken up at the end of half an hour, when the other paper will be given out.
The sums are not to be copied out.
Add the columns placing the answers in the spaces provided. More importance will be attached to accuracy than to quickness.

Fill this in first $\{$
$\left\{\begin{array}{l}N \\ \end{array}\right.$
Name of Pupil


## commercial arithmetic．－Second Paper．

## Thursday，17th June． 2.30 p．m．to 4 р．м．

All the work must be shown，and such explanation added as is required to indicate the methods adopted．
Additional marks will be given for neatness，arrangement，and style．
1．What is the cost of 14 tons 2 ewt． 3 qrs． 14 lbs．，at $f 66 s .8 d$ ．per ton．
2．Express in acres，roods，and poles，correct to the nearest pole，the area of a rectangular field，whose length is 313 yards and breadth 175 yards．
3．A room is 49 ft .6 in ．long， 37 ft .4 in ．broad，and 13 ft .2 in ．high． What is the largest number of persons it can hold so that each shall have at least 80 cubic feet of air？
4．A dealer buys Ceylon tea at $£ 12$ per cwt．，and Chinese tea at $£ 96 s$ ．per cwt．，mixing them in the proportion of 3 of the former to 7 of the latter．Find，to two decimal places，how much per cent．he will gain or lose by selling the mixture at $2 s$ ．per 1 b ．？
5．A creditor allows his debtors a discount of $2 \frac{1}{2}$ per cent．，and gives the agent who collects the money $\frac{1}{4}$ per cent．of the sum collected by him．What will the creditor receive out of debts amounting to $£ 6,800$ ？
6．A litre contains a cubic decimetre．Taking a metre as 3.28 feet， and a gallon as containing 16 cubic teet，find what decimal fraction a litre is of a gallon，correct to two decimal places．
7．The rateable value of a town is $£ 653784$ ；an assessment ，has to be made for a charge of $£ 27846$ ．What will be the necessary rate in the pound，expressed in pence and hundredths of a penny？ How much will be collected in excess of the requirement if all the assessment is paid in？
8．Define the par of exchange and the course of exchange．
If the par of exchange between London and Paris be 25.17 ， and the course of exchange be quoted at 25.21 ，find，to three decimal places，at how much per cent．premium English money stands．
9．An investor buys $£ 1,000$ stock in each of the following，the prices named including brokerage ：－Consols， $2 \frac{3}{4}$ per cent．，at $108 \frac{11}{1}$ ； London and North Western， 3 per cent．，at 1173⿱⿱亠䒑女子年；Natal， $3 \frac{1}{2}$ per cent．，at $109 \frac{1}{2}$ ；Tasmania， 4 per cent．，at $115 \frac{1}{8}$ ．Find the cost of the whole，and the average rate of interest obtained，correct to two decimal places．

