

Eton College King's Scholarship Examination 2007

GENERAL 1

(One and a half hours)

*Answer **all** the questions on the yellow answer sheets provided. There is a separate answer sheet for each question.*

You need not answer the questions in the order set. If you have not finished a question after 20 minutes you are advised to leave it and go on to another. Return to any unfinished question if you have time left at the end of the paper.

Each question is worth 25 marks.

[Question 1 begins overleaf]

1. Harry Shakespeare has long been convinced that he is the direct descendant of the poet, William Shakespeare. Unfortunately, Harry has been unable to write a poem that will help him to prove this link to a sceptical world. In desperation, he has approached your poetry consultancy firm to help him put the finishing touches to a sonnet he has been working on for some years.

A Shakespearean sonnet is a fourteen-line poem arranged in three quatrains and a couplet, thus:

4

4

4

2

(=14)

Its rhyme scheme is as follows:

abab cdcd efef gg (this is an algebraic representation of the sound endings of each line).

Rhythm: each line is composed of five iambs, and each iamb is composed of an unstressed (or short) syllable followed by a stressed (or long) syllable. In other words, sonnets are 140 syllables long.

- (a) Harry is certain of the words he wants to use in his sonnet, but he's less sure about their order. Using the information given below, complete his quatrains. You must use every word, and you must, of course, preserve the poetic form as explained above.

Note: All the words in Harry's list have capital letters – but only some will need them in the poem. Words correctly placed score marks; words in the wrong place lose marks.

Use the area on the next page as working and write your final answer on the yellow answer sheet for question 1 (a).

[10]

SONNET 1

Use the area below for working only.

_____ it is to _____ the _____!
 Its _____ webs of promise and _____
 Remind the _____ of hopes that could not last
 And _____ the soul with _____ and defeat.

The _____ of life once opened up _____
 And _____ its joys in _____ from _____.
 All _____ thoughts and sadness swiftly _____
 And freed us from the enemies of _____.

What _____ we were to _____ in the

 When _____ and _____ gathered all about.
 What chances once presented in our _____
 Were _____ from first to _____ and
 _____.

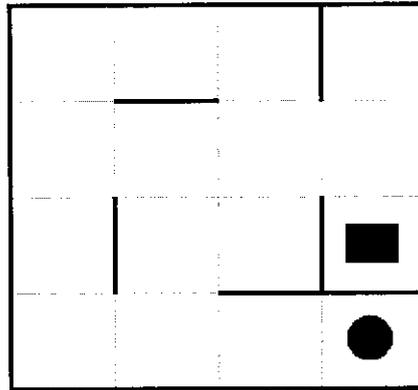
Darkened	Doomed	Doubt	Tarry	Deceit
Tempests	Misery	Unwise	Sight	Spilt
Heart	Love	Tangled	Past	Fools
Above	Storms	Sorrow	Contemplate	Sunlight
Fled	Crush	Ahead	Path	Light

- (b) Harry's sonnet is missing its couplet. Write one for him, making sure it fits the subject and style of the poem. You will be marked for how accurately you employ rhyme and metre (5 marks) and also how far your couplet successfully concludes the subject of the preceding 12 lines (10 marks).
Write your answer on the yellow answer sheet for question 1 (b).

[15]

[Total 25]

2. Below is a maze. Inside the maze are a circle and a rectangle.



Your task is to work out how to get from the circle to the rectangle. This is not quite as easy as it sounds as there are special rules that apply to solving this maze.

Rule one: you are only allowed to move horizontally or vertically; you cannot move diagonally.

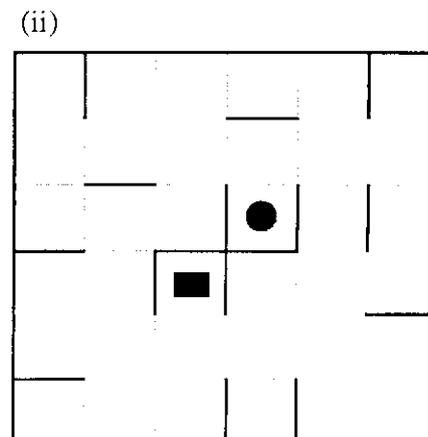
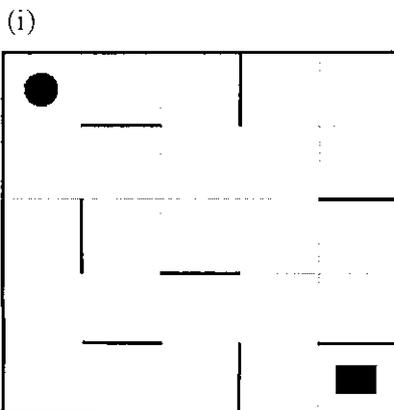
Rule two: any move must continue in the same direction until a bold line is reached.

One way of describing the solution to this maze is to state the directions you would move in, from the start (circle) to the finish (rectangle). The solution for the maze shown above is:

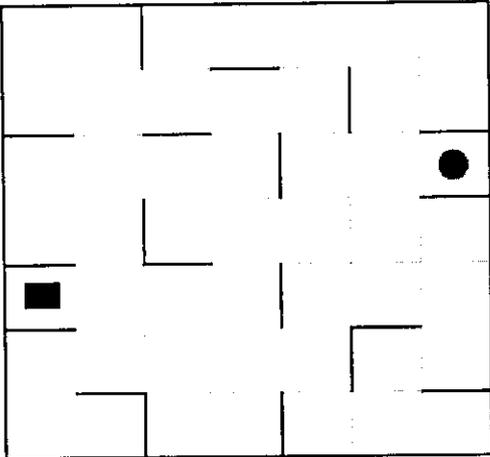
Left	Up	Right	Down	Left	Up	Right	Down
------	----	-------	------	------	----	-------	------

- (a) On the yellow answer sheet for question 2 write down a solution for each of the mazes shown below, following the same rules and using the same notation as in the above example. **Your solution should have the same number of steps as there are boxes in the answer grid (on the yellow answer sheet) for each maze.**

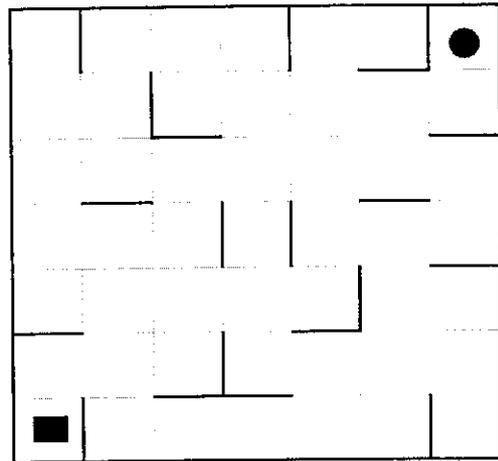
[12]



(iii)



(iv)



- (b) On the answer sheet for question 2 is a blank grid on which the start (circle) and finish (rectangle) have already been added.
- Add bold lines to this grid to create your own maze that should be solved using the rules described on the previous page. You will be awarded marks for making the maze difficult to solve.
 - Indicate the correct path using clearly drawn arrows on your grid.

[13]

[Total 25]

3. Read the following passage on the relationship between society and individuals and answer the questions which follow:

By virtue of the law of nature, man has a power, not only to preserve his property, that is, his life, liberty and estate*, against the injuries and attempts of other men, but also to judge of, and punish the breaches of that law in others, as he is persuaded the offence deserves, even with death itself, in crimes where the heinousness* of the fact, in his opinion, requires it. But because no political society can be, nor subsist*, without having in itself the power to preserve the property, and in order thereunto punish the offences of all those of that society, there only is political society where every one of the members has quitted this natural power and resigned it up into the hands of the community in all cases that exclude him not from appealing for protection to the law established by it. And thus all private judgment of every particular member being excluded, the community comes to be umpire, by settled standing rules, indifferent*, and the same to all parties. By men having authority from the community for the execution of those rules, it decides all the differences that may happen between any members of that society, concerning any matter of right, and punishes those offences, which any member has committed against the society, with such penalties as the law has established. Whereby it is easy to discern who are, and who are not, in political society together. Those who are united into one body, and have a common established law and judicature* to appeal to, with authority to decide controversies between them, and punish offenders, are in civil society one with another, but those who have no such common appeal, I mean on earth, are still in the state of nature, each being, where there is no other, judge for himself, and executioner; which is, as I have before shown, the perfect state of nature.
(315 words)

*estate: possessions and wealth

*heinousness: wickedness

*subsist: exist

*indifferent: unbiased

*judicature: body of judges

(adapted from John Locke, *Two Treatises of Government*, 1698)

- (a) Summarise the passage in about seventy words.

[15]

- (b) John Reid, Home Secretary, said in a speech made in 2006, “We may have to modify some of our freedoms in the short term in order to prevent their misuse and abuse by those who oppose our fundamental values and would destroy our freedoms and values in the long term”. To what extent do you think the community should be able to restrict individual freedoms in the interest of long-term benefits? Give specific examples (not necessarily from the text above) in your answer.

[10]

[Total 25]

4. (a) *“The most important thing in the Olympic Games is not winning but taking part; the essential thing in life is not conquering but fighting well.”*
Baron de Coubertin, founder of the Modern Olympic Movement.

“I firmly believe that any man's finest hour, the greatest fulfilment of all that he holds dear, is that moment when he has worked his heart out in a good cause and lies exhausted on the field of battle – victorious... Winning isn't everything, it's the only thing. If it doesn't matter who wins or loses, then why do they keep score?”

Vince Lombardi, coach of the Green Bay Packers, Superbowl Champions 1966 & 1967.

Explain in no more than 100 words whether you agree with de Coubertin or Lombardi.

[9]

- (b) *“Serious sport has nothing to do with fair play. It is bound up with hatred, jealousy, boastfulness, [and] disregard of all rules..... In other words, it is war minus the shooting.”*

George Orwell, “The Sporting Spirit”, Tribune Magazine 1945.

As sports have become more serious and “professional”, disputes have become more common. Below you will find two examples of results where fair play has been questioned and an enquiry held. Read the situations described and respond to the questions in italics. In each instance, you should aim to construct a concise argument in a maximum of 100 words.

- (i) Going into the last race of the motor racing world championship, Keke Blanc has 94 points, Horst Katz 96 points. Both drivers have dominated the championship races all year; their nearest rivals have 60 points each. A driver receives 10 points for a win. Blanc and Katz are on the front row of the grid and at the start of the race will contest the first corner – a sharp right-hander called the Maranello. As the race starts, Blanc moves ahead of Katz and then starts to brake for the Maranello corner. Katz does not brake at all but ploughs into Blanc, wrecking both cars. Neither driver scores any points.

After an enquiry the governing body of motor racing deducts 10 points from Katz for his allegedly unsporting conduct.

Do you think this was a fair decision?

[8]

- (ii) It has long been suspected that many cyclists in the Tour de France use performance-enhancing drugs. One of the teams has made a pledge that it will not use any drugs or artificial stimulants. Guy de Klink, a member of this team, wins the toughest mountain stage of the Tour. He is subsequently tested for drugs and none are found. However, it is discovered that he has very high levels of red blood-cells. He freely admits that 2 months before the event he gave some blood to his medical team and this had been concentrated and re-injected just before the mountain stage. This enhanced his performance. At a subsequent enquiry, Mr de Klink is disqualified from the Tour. *Do you think this was a fair decision?*

[8]

[Total 25]

1. (a)

_____ it is to _____ the _____!

Its _____ webs of promise and _____

Remind the _____ of hopes that could not last

And _____ the soul with _____ and defeat.

The _____ of life once opened up _____

And _____ its joys in _____ from _____.

All _____ thoughts and sadness swiftly _____

And freed us from the enemies of _____.

What _____ we were to _____ in the _____

When _____ and _____ gathered all about.

What chances once presented in our _____

Were _____ from first to _____ and _____.

King's Scholarship Examination 2007. Answer Sheet – <u>to be handed in.</u>	Candidate Number:	
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2. (a) (i)

(ii)

(iii)

(iv)

2. (b)

		■			
			●		

Eton College King's Scholarship Examination, 2007.

ENGLISH

(One and a half hours)

You are advised to divide your time equally between parts I, II and III. Attempt all parts and questions.

Part I [30 marks]

Sentences are made up of words which form a particular part in their structure: parts of speech (noun, pronoun, adjective, verb, adverb, preposition, conjunction and interjection). 'The' is usually called the definite article; 'a' or 'an' are usually called the indefinite article.

1. Write out ~ as a list ~ suitable words for each of the parts of speech indicated in the passage below. **Marks will be given both for accuracy and imaginative use of language.**

An Englishman, who was spending **(i. indefinite article)** holiday in Spain, went **(ii. adjective)** day **(iii. preposition)** a restaurant **(iv. preposition)** Madrid.

He **(v. verb)** to order **(vi. adjective)** beef with mushrooms but he **(vii. verb)** not speak **(viii. noun)**. He took a **(ix. noun)** of paper **(x. preposition)** his **(xi. adjective)** pocket **(xii. conjunction)** drew a cow and a mushroom; then he **(xiii. verb)** the waiter over and **(xiv. verb)** the pictures to **(xv. pronoun)**.

The waiter seemed to understand, and went **(xvi. adverb)**. **(xvii. Adverb)** afterwards, he returned, smiling, and **(xviii. verb)** and **(xix. verb)** the Englishman an umbrella **(xx. conjunction)** a ticket for a bull-fight.

(xxi. Definite article) waiter could **(xxii. adverb)** understand why his **(xxiii. noun)** was so **(xxiv. adverb)** bemused.

The moral of **(xxv. adjective)** story is that when you **(xxvi. verb)** **(xxvii. preposition)** a **(xxviii. adjective)** country, **(xix. pronoun)** should make an effort to **(xxx. verb)** its language.

Part II [30 Marks]

Read the following passage and answer the questions that follow.

Flight

From the earliest days of civilization the lord of creation has been inclined to chafe at his inferiority to the meanest cabbage-white butterfly or house-sparrow in the matter of flight. Until the end of the nineteenth century, nothing practical had come of it, beyond the ability to drift precariously about in the cars of
5 balloons. But in a more than literal sense, it might have been said that flying was in the air. One of the commonest books about the future described how some man had worked out the plans of a completely efficient airship and thereby achieved power to impose his own terms on the rest of the species. Meanwhile, inventors were working out the designs of flying-machines that never quite
10 succeeded in flying. Even advanced thinkers were inclined to be sceptical whether the final product of these activities was likely to be anything more than an ingenious toy and there were still pious folk to deplore the presumption of those who invited the wrath of the Almighty by trying to improve upon his plan of creation.

15 It was the success of the brothers Wright in 1903 that at last manifested to the world that the age of flying had actually dawned and henceforth, progress was astonishingly rapid. So implicit was the faith in any sort of mechanical improvement, that nothing but delighted applause was excited, in 1909, by what might well have been regarded as one of the most ominous events in British
20 history. A Frenchman, M. Bleriot, undeterred by the failings of a compatriot a few days earlier, succeeded in piloting his monoplane across the Channel and landing near Dover. Henceforth, Britannia might lord-it as she would over the waves – but her iron walls were no protection against an enemy who could fly over them. War had been transferred to a third dimension.

25 The conquest of the air was undoubtedly the most spectacular feature of the reign of George V. In an incredibly short space of time, the sight and sound of the aeroplane became familiar to dwellers on the route from Croydon to the Continent. Records for speed, height and distance were continually being surpassed, while stunt-flying began to be practised and the loop was successfully looped. With
30 construction still in the experimental stage, the life of the leading airman was held on the most precarious tenure, although the number of prominent casualties served only to increase the thrills of this new chase after speed.

2. Express what is meant by the following sentences as they are used in the passage:
- i) 'From the earliest days of civilization the lord of creation has been inclined to chafe at his inferiority to the meanest cabbage-white butterfly or house-sparrow in the matter of flight.' (lines 1-3)
 - ii) 'But in a more than literal sense, it might have been said that flying was in the air.' (lines 5-6)
 - iii) 'And there were still pious folk to deplore the presumption of those who invited the wrath of the Almighty by trying to improve upon his plan of creation.' (lines 12-14)
 - iv) 'War had been transferred to a third dimension.' (line 24)
 - v) 'With construction still in the experimental stage, the life of the leading airman was held on the most precarious tenure.' (lines 29-31)
- [15]
3. What makes the piece an effective and informative ~ perhaps even entertaining ~ piece of writing? Give clear reasons for your comments and quote freely from the text where appropriate.
- [15]

Part III [40 marks]

4. **Either**

Imagine that you were a witness to an early pioneer's attempt at flight. Write *either* an article for a newspaper *or* a personal journal describing the experience.

Or

Describe a time when you were embarrassed by a fellow countryman.

Or

Argue the significance to the people of Britain of being 'an island race'.

Eton College King's Scholarship Examination 2007

MATHEMATICS A

(One and a half hours)

Answer Question 1 and as many of the other five questions as you can.

Question 1 is worth 50 marks. All other questions are worth 10 marks each.

Show all of your working.

1. Compulsory Question

(a) Solve the following simultaneous equations:

$$\begin{aligned}4x + 3y &= 29 \\5x + 2y &= 31\end{aligned}\quad [4]$$

(b) Two houses increased in value by 5% over 2006.

(i) One of the houses was worth £150,000 on 1st January 2006.
How much was it worth on 1st January 2007? [1]

(ii) The other house was worth £420,000 on 1st January 2007.
How much was it worth on 1st January 2006? [2]

(c) Solve the following inequality : $19 - 3x < 34$. [3]

(d) Find the value of s where $s = ut + \frac{1}{2}at^2$ where $u = 5$, $a = 4$ and $t = 3$. [2]

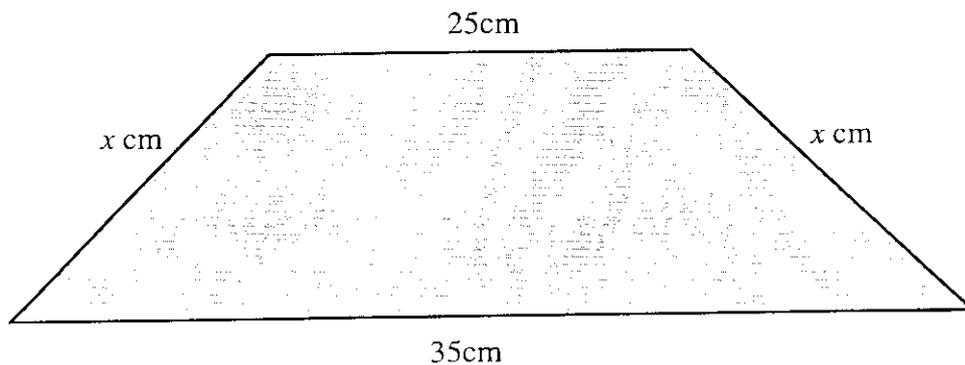
(e) A car's petrol consumption is 42 miles per gallon.

One gallon is 4.546 litres, one mile is 1.6km.

(i) What is the car's petrol consumption in km per litre? [3]

(ii) If petrol costs 90.9 p per litre then how much would the petrol cost for a journey of 800km? [4]

(f)



(i) Given that the area of the above trapezium is 300 cm^2 , find its height. [2]

(ii) Find the value of x . [2]

(g) Simplify the following as far as possible:

(i) $(x+2)(x-2) + x(x-4) + 4(x+1)$ [2]

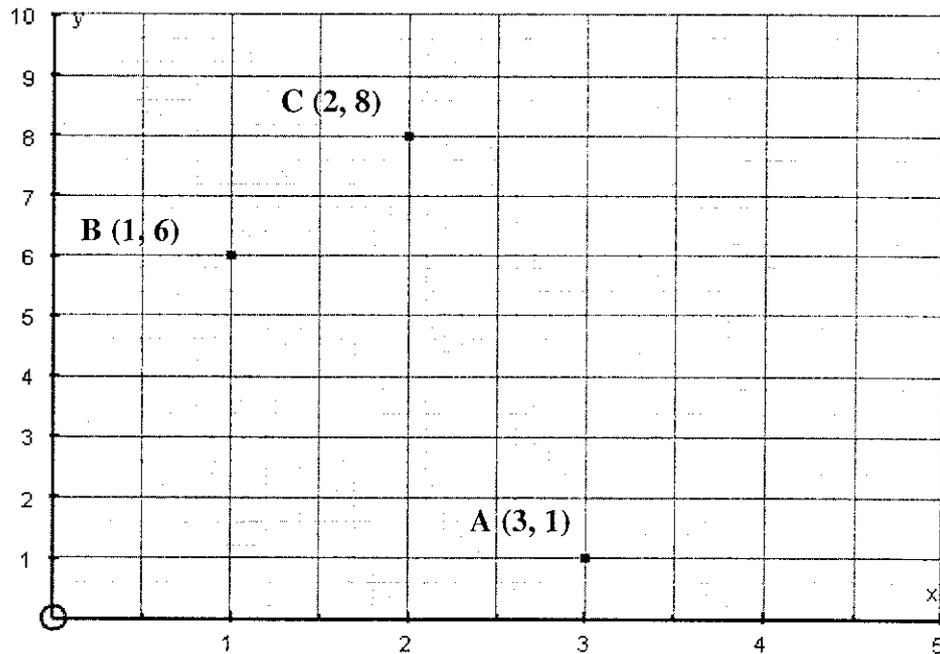
(ii) $(x-2)(x+3) - (x+2)(x-3)$ [3]

Turn over for the remainder of question 1

- (h) Each exterior angle of an n -sided regular polygon is $\frac{D}{n}$ where D is a number that does not change for different values of n .

- (i) What is the value of each exterior angle of an equilateral triangle? [1]
(ii) Use this to find the value of D . [1]
(iii) Hence find the value of each exterior angle of a regular hexagon. [1]
(iv) Each exterior angle of a regular polygon is 18° . How many sides does it have? [1]

- (i) (i) Find the distance between the points A and B shown below. [3]



- (ii) Find the coordinates of the point D such that ABCD (labelled in that order) is a parallelogram. [2]

- (j) (i) Find the mean of the following numbers : 5, 7, 10, 6, 12. [2]
(ii) If 12 was replaced with 52 then what would happen to the median of the numbers? [1]

- (k) Solve the following:

- (i) $\frac{1}{3}x + 5 = 7$
(ii) $\frac{2}{5}(3x + 1) = 4$
(iii) $\frac{2}{3}(x + 1) + \frac{1}{4}(x - 1) = 3$

[2, 2, 3]

- (l) Charlie got some sweets for his birthday. He gives $\frac{2}{3}$ of his sweets to John. John then gives $\frac{4}{5}$ of these sweets to Harry. If John was left with 4 then:
(i) How many did Charlie have left? [2]
(ii) How many was John given? [1]

2. On the back of every modern book you can find an ISBN code. This is a ten digit number which uniquely defines the book such as the one below.



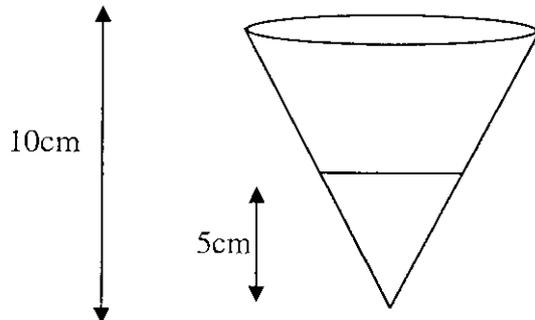
On the back of Tolkein's *The Return of the King* is the ISBN code 0007203608.

Take the first digit of the ISBN code and multiply it by 1, the second digit and multiply by 2, the third digit and multiply by 3. When you carry this on and add them all together you get what we will call the book's ISBN check number. We call it the ISBN check number because a ten digit number is a valid ISBN number if and only if this check number is a multiple of k , where k is a whole number that is the same for all books.

- (a) Show that *The Return of the King*'s ISBN check number is 187. [2]
- (b) What is the ISBN check number for Tolkein's *The Two Towers*, whose ISBN code is 0007203594? [2]
- (c) Given that all ISBN check numbers are multiples of the whole number k , use (a) and (b) to find the value of k . [2]
- (d) (i) A boy rings up a bookshop to order *The Fellowship of the Ring*. He reads the ISBN number out as 0007203581. Explain why the bookshop's computer will state that this ISBN is not valid. [1]
- (ii) The boy realises that the last digit of the ISBN was wrong. What should it have been? [3]

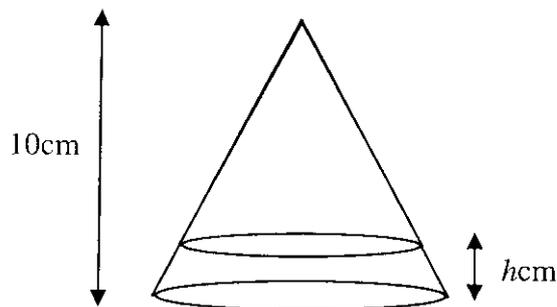
3. (a) If the radius and the height of a cone are doubled in length then by what factor will the volume of the cone be increased? [3]

- (b) 100 cm^3 of water is poured into the cone below. It comes to a height of 5cm, which is half the height of the cone.



- (i) How much water would be in the cone if it was filled to the top? [2]

- (ii) There is a lid on the cone and it is now turned over.

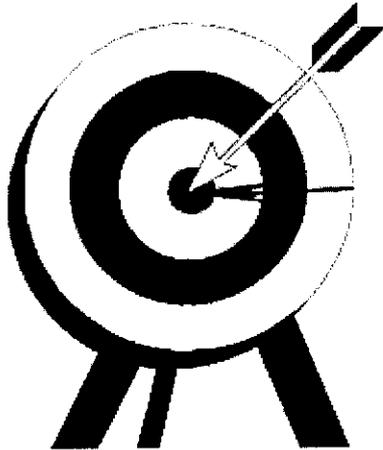


What will the height of the water be in the cone? (Give your answer to 3 significant figures.) [5]

4. (a) Simplify the expression $(a-b)^2 + (a-c)^2 + (b-c)^2$ as far as possible. [2]
- (b) Hence prove that $a^2 + b^2 + c^2 \geq ab + ac + bc$. [2]
- (c) Show that this inequality holds for $a = 5$, $b = 3$ and $c = 1$. [1]
- (d) Multiply both sides of the inequality in (b) by $a + b + c$, where $a + b + c \geq 0$. Use this to copy and complete the following inequality, expressing the right hand side as simply as possible:
 $a^3 + b^3 + c^3 \geq \dots$ (where a , b and c are all positive numbers). [5]

5. In an archery competition decider, Arthur shoots an arrow and Brian shoots an arrow. If one of them hits the bullseye and the other one doesn't then the one who hit the bullseye is the winner. Otherwise they fire an arrow each again. This process continues until one hits and the other misses.

The probability of Arthur hitting the bullseye with his first arrow is 0.45. The probability of Brian hitting the bullseye with his first arrow is 0.4.



- (a) Show that the probability that neither Arthur nor Brian hits with their first arrow is 0.33. [1]
- (b) Find the probability that Arthur wins the competition by only firing one arrow. [2]
- (c) Find the probability that Brian wins the competition by only firing one arrow. [2]

If Arthur misses the bullseye with one arrow then the probability of his hitting the bullseye with his next arrow falls to a value of 0.2.

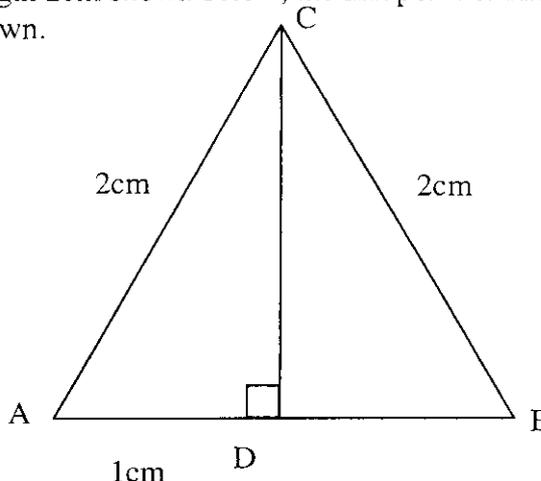
If Brian misses the bullseye with one arrow then the probability of his hitting the bullseye with his next arrow falls slightly to a value of p .

- (d) What is the probability, in terms of p , that Brian wins with his second arrow? (i.e. Arthur and Brian both miss with their first arrow, Arthur misses with second arrow and then Brian hits with second arrow). [2]
- (e) Find the value of p such that the probability of a competitor winning with either his first or second arrow is the same for both Brian and Arthur. [3]

6. All answers to this question should be given as exact values.

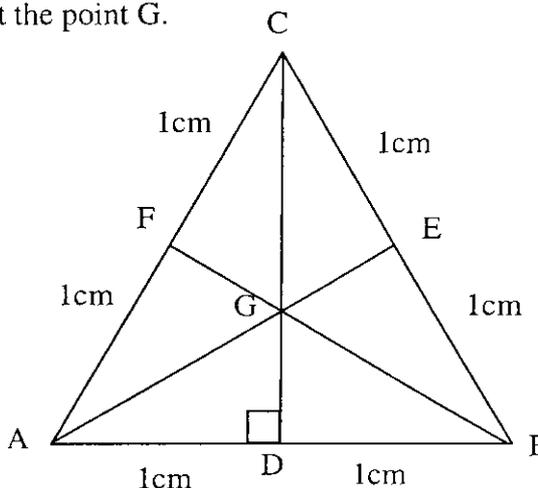
For example, if the answer is $\sqrt{2}$, then this should be given as $\sqrt{2}$ and not as 1.41 (to 3 significant figures).

In the equilateral triangle ABC of side length 2cm shown below, the midpoint of AB is marked as D and the line CD has been drawn.



- (a) Find the *exact* length of CD. [2]
 (b) Hence find the *exact* area of the triangle ABC [2]

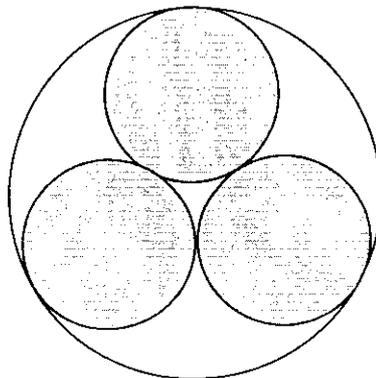
In the diagram below the midpoint of BC is marked as E and the midpoint of AC is marked as F. AE, BF and DC all meet at the point G.



- (c) By considering the area of the triangle AGB, find the exact length of GD. [2]

In the diagram below the three smaller circles all have radius 1cm.

- (d) What is the *exact* value of the radius of the larger circle? [4]



END OF PAPER

Eton College King's Scholarship Examination 2007

LATIN

(One and a half hours)

Answer question 1 and ONE other question.

1. Answer all the questions on the following passage.

Alexander the Great has defeated Darius and the Persians at the battle of Issus. Darius has fled on horseback. His wife and mother are being held as prisoners by Alexander.

- 1 rex Alexander, qui diu Darium secutus erat et iam fessus erat, quod illo die nulla
spes victoriae erat, ad **castra** hostium, a suis militibus capta, advenit. deinde ad
cenam invitavit amicos quibus maxime **favebat** sed subito e **proximo tabernaculo**
ingens clamor **convivas** perterruit. custodes quoque ad **tabernaculum** regis
5 celeriter contenderunt ut eum protegerent. causa terroris fuit quod mater uxorque
Darii cum captivis nobiles ingenti **gemitu** Darium **deflebant**, quod eum
interfectum esse credebant. nam unus e captivis **amiculum**, quod Darius in
agrum prope viam iecerat ne ab hostibus conspiceretur, in manibus servi qui id
ferebat **agnovit**. captivus autem **putabat** amiculum, rege interfecto, a milite
10 **quodam detractum esse**. itaque falsum nuntium mortis Darii tulerat.

QUINTUS CURTIUS (adapted)

castra, -orum (n pl)	camp	defleo, -ere, -evi, -etum	I weep for
faveo, -ere, favi, fautum	I favour (+ dat)	amiculum, -i (n)	cloak
proximus, -a, -um	nearest	agnosco, -ere, agnovi, agnitum	I recognise
tabernaculum, -i (n)	tent	puto, -are, -avi, -atum	I think
conviva, -ae (m)	guest	quidam, quaedam, quoddam	a certain
gemitus, -us (m)	groaning	detraho, -ere, -traxi, -tractum	I drag away

- (a) Translate the whole passage into English, writing your translation on alternate lines. [40]
- (b) State and explain the case of *illo die* (line 1). [2]
- (c) State and explain the cases of the following nouns:
(i) *castra* (line 2);
(ii) *hostibus* (line 8). [2]
- (d) *quibus* (line 3): put this word into the singular, keeping the same gender and case. [1]

- (e) Make these nouns singular, leaving the cases unchanged:
(i) *militibus* (line 2);
(ii) *amicos* (line 3);
(iii) *captivis* (line 6). [3]
- (f) *interfectum esse* (line 7): state which type of infinitive this is and explain why an infinitive is used here. [3]
- (g) *conspiceretur* (line 8): state exactly which part of the verb this is. [3]
- (h) *iecerat* (line 8): put this verb into the subjunctive, keeping the same tense and person. [2]
- (i) *rege interfecto* (line 9): put this phrase into the plural. [2]
- (j) *tulerat* (line 10): put this verb into the passive, keeping the same tense and person. [2]

[Total for question 1: 60 marks]

ANSWER EITHER QUESTION 2 OR QUESTION 3

2. Read the following passage, then answer the questions which follow. **DO NOT TRANSLATE** unless you are specifically asked to do so. You should pay careful attention to the number of marks available for each question.

Alexander, moved by the women's plight and the misfortune of Darius, sends one of his courtiers, Leonnatus, to tell them that Darius is still alive. The prisoners, fearing that he has been sent to kill them, remain silent inside their tent.

- 1 Leonnatus, cum unam horam exspectavisset, postquam nemo exire audebat, relictis in **vestibulo** comitibus, tabernaculum intravit. ea ipsa res terruit feminas, quod **irrupisse** videbatur, non admissus esse; itaque mater et coniunx eum orabant ut, antequam interficerentur, sibi permitteret corpus Darii **patrio more**
- 5 **sepelire**. Leonnatus dixit et vivere Darium et eas non solum **incolumes** esse sed etiam mox domum redire posse. tum tandem mater Darii laeta erat. Leonnatus **postero** die, **sepultis** militibus quorum corpora invenerat, imperavit ut nobilissimi Persae eundem honorem haberent, matremque Darii iussit quos vellet **patrio more sepelire**. hoc facto, Alexander praemisit milites ad captivas ut nuntiarent
- 10 ipsum venire, et postea, magna **comitante** turba, tabernaculum cum Hephaestione intravit. is omnium amicorum longe carissimus erat regi. cum amicus altior quam Alexander esset, feminae illum esse regem credebant et magna voce laudaverunt. deinde, servis Alexandrum ostendentibus, captivae iterum maxime perterritae erant cum putarent regem iratum esse. rex tamen dixit: "non erravistis;
- 15 nam hic vir mihi **simillimus** est".

QUINTUS CURTIUS (adapted)

vestibulum, -i (n)	hall	incolumis, -e	unharméd
irrumpe, -ere, irrupi, irruptum	I burst in	posterus, -a, -um	next
patrius, -a, -um	ancestral	comitor, -ari, -atus sum	I accompany
mos, moris (m)	custom	similis, -e (+ dative)	similar to
sepelio, -ire, -ivi, sepultum	I bury		

- (a) Lines 1-2: after waiting outside the tent for an hour, what two things did Leonnatus do? [2]
- (b) Lines 2-3: why did his actions frighten the women? [3]
- (c) Lines 3-5: what request did Darius' mother and wife make to Leonnatus? [3]
- (d) Translate Leonnatus' reply in lines 5-6 (*Leonnatus dixit.....redire posse*). [5]
- (e) Line 6: how did Darius' mother react to Leonnatus' reply? [1]
- (f) What orders did Leonnatus give in lines 7-9? [6]
- (g) Why did Alexander send soldiers to the prisoners in lines 9-10? [3]

- (h) Lines 10-11: describe the circumstances of his entrance into the tent. [3]
- (i) How is Hephaestion described in lines 11-12? [4]
- (j) State exactly which parts of the verb are:
 (i) *irrupisse* (line 3); and
 (ii) *permitteret* (line 4). [2]
- (k) Give two examples of the ablative absolute construction from this passage. [2]
- (l) *hic vir mihi simillimus est* (line 15): turn these words of Alexander into indirect speech, introduced by the verb *dixit*. [4]
- (m) From your reading of lines 11-15, what kind of man do you think Alexander was? Explain your answer. [2]

[Total for question 2: 40 marks]

3. Translate this passage into Latin, writing your translation on alternate lines.

With a *favourable* wind, the king and his army arrived at the holy island before night and made camp on the *shore*. The king *gathered* his soldiers and spoke to them thus: "I know that there is one town on this island. We must capture it quickly." In the middle of the night, the young men were frightened and an old man called Torquatus persuaded them not to wait for dawn but to kill the king at once. "Why do we follow an arrogant young man whose father once ruled us wisely but who has now led us into very great danger?", he asked. He spoke well. The soldiers, therefore, did not *delay* but *seized* their weapons to attack the king as he slept. The king himself was saved by the bravery of his guards and punished Torquatus on account of his *treachery*.

[Total for question 3: 40 marks]

secundus, -a, -um	favourable
ora, -ae (f)	shore
convoco, -are, -avi, -atum	I gather
moror, -ari, -atus sum	I delay
rapio, -ere, rapui, raptum	I seize
perfidia, -ae (f)	treachery

END OF PAPER

Eton College King's Scholarship Examination 2007

FRENCH

(One and a half hours)

WRITE YOUR CANDIDATE NUMBER HERE: CAND

This paper consists of five questions. You must answer ALL the questions, and complete the first four in an hour. The time taken to read the passage for Question 5 is in addition to the one and a half hours given for the paper. Your answers to Questions 1 and 4 should be written ON THE QUESTION PAPER in the spaces provided. Your answers to Questions 2, 3 and 5 should be written on examination stationery.

1. *USE OF FRENCH (10 marks). You are advised to spend no more than ten minutes on this question. Write your answers in the spaces provided.*

a) *Translate the following verb forms into French, using the verb that is given in brackets:*

(payer) They pay :

(bouillir) They are boiling :

(s'asseoir) Do not sit down! (*2nd person singular*) :

(envoyer) I will send :

(courir) He will run :

(courir) He used to run :

(être) I used to be :

(partager) You were sharing (*2nd person singular*) :

(craindre) She has been afraid :

(couvrir) I have not covered :

2. READING COMPREHENSION (25 marks) :

To be written on examination stationery.

Read the following passage carefully and then answer questions (a) – (q) IN ENGLISH. Your answers must be based on the information contained in the text.

LES NORMANDS NÉGLIGENT LE CODE DE LA ROUTE

Sceptiques les Normands ? C'est ce que pourrait laisser croire l'étude réalisée par *l'institut de sondage (m)* TNS Sofres pour Axa Assurance et rendue publique aujourd'hui. Il en ressort en effet que les Normands sont les conducteurs français les moins sensibles aux campagnes de prévention contre l'insécurité routière. *Preuve supplémentaire(n)* de cette méfiance à l'égard des mesures mises en œuvre par l'Etat pour diminuer le nombre d'accidents sur les routes, leur rapport aux radars. Pour 65 % des habitants de la région, ceux-ci ne sont en effet qu'un moyen pour « renflouer les caisses de l'Etat ». Aucunement un outil de lutte contre les comportements à risque. « *Je suis choqué qu'on dise cela, s'emporte Jean-Paul Dubois, directeur de cabinet du préfet de Région. Si on voulait piéger les gens, on n'annoncerait pas les radars avec des panneaux. Associés à la prévention, ils ont sauvé des vies* ». Sur les onze premiers mois de 2006, le nombre de tués sur les routes a baissé de 18 % en Seine-Maritime. De bons résultats qui ne masquent pourtant pas l'augmentation des *comportements à risque (o)*.

Les Normands sont ainsi les plus contrevenants pour le passage à l'orange aux feux tricolores. Une infraction que 59 % d'entre eux ne considèrent pas comme dangereuse et qu'ils sont 78 % à commettre ! « *Oublier les clignotants (50 % à le faire), doubler sur une ligne blanche (32 %), rouler à 65 km/h en ville (50 %) ou encore téléphoner en voiture (29 %) sont des infractions fréquentes, confie David Charbonnier, délégué Prévention routière en Seine-Maritime. Surtout en ville* ». Si alcool au volant et vitesse excessive sont deux délits pour lesquelles prévention et répression ont été efficaces, la préfecture de Seine-Maritime souhaite s'attaquer à tous les autres comportements à risque. « *Des motos banalisées devraient patrouiller en ville pour relever toutes ces infractions qui représentent un danger réel, affirme ainsi Jean-Paul Dubois. Le port de la ceinture, les stationnements gênants, les priorités non respectées vont être surveillés* ». Alors que plus d'un Normand sur quatre est favorable à un *assouplissement des sanctions (p)*, les associations ainsi que les services de l'Etat n'y sont pas favorables. A l'image de Michel Fauchart, délégué Prévention routière dans l'Eure : « *La répression actuelle me paraît juste car il y a encore trop de contrevenants (q)* ».

- (a) How are Norman drivers characterised in the opening lines? [2]
(b) What do the majority think speed cameras are used for? [2]
(c) What possible good use of speed cameras do they reject? [2]
(d) What is the reaction of Jean-Paul Dubois to this? [1]
(e) According to M. Dubois, if the authorities wanted to catch people out, what would they NOT do? [1]
(f) Still according to him, what have speed cameras in fact helped to do? [1]
(g) What has happened over the first 11 months of 2006, in the *département* of Seine-Maritime? [1]
(h) What is the most common fault of drivers in Normandy, and what do they themselves think of this? [2]
(i) Give three other common faults of Norman drivers. [3]
(j) Which two faults have been successfully reduced? [2]
(k) Name two of the most common driving errors committed in towns. [2]
(l) How is it proposed that these be controlled and checked? [1]
(m-q) What do you think the words or phrases in *bold italics* mean? You may translate them or explain them. [5]

3. TRANSLATION (25 marks)

To be written on examination stationery.

Translate into English, paying attention to the style as well as the accuracy of your translation.

UNE MAISON DE FERME DÉTRUITE PAR UN INCENDIE

Hier, peu avant 15 h, ce sont des voisins qui ont donné l'alerte, intrigués par des bruits de crépitement et de la fumée sortant du toit de la maison de ferme située à quelques mètres de chez eux, au hameau du Cran, en Plouguenast. A cette heure-là, les locataires de cette maison d'habitation, M. et Mme Philippe Barnier, arrivés récemment en Centre-Bretagne, étaient absents.

A leur arrivée, les pompiers de Plouguenast, rapidement secondés par leurs collègues de Ploëuc-sur-Lié et de Loudéac, soit 18 hommes au total, devaient découvrir l'ampleur du désastre. Le feu, qui avait, semble-t-il, débuté au premier et unique étage, était en train de ravager tout l'intérieur. Malgré la rapidité de l'intervention, dirigée par le lieutenant Jean-Louis Hamayon, de Loudéac, toutes les pièces de la maison de ferme (chambres, cuisine, séjour, etc.) ont été détruites. Pour protéger les bâtiments proches de la maison, les pompiers ont dû faire vite, arrachant une partie de la toiture. Le sinistre a été maîtrisé vers 16 h 40.

Les dégâts sont considérables. De la maison, récemment rénovée par le propriétaire, un habitant de Gausson, il ne reste que les murs et la charpente. Selon les gendarmes de Plouguenast, la cause du sinistre, d'origine accidentelle, pourrait être électrique. Les trois occupants, M. et Mme Barnier et leur fils, majeur, ont trouvé une solution de relogement chez la fille du couple qui réside dans la région.

4. TRANSLATION INTO FRENCH (10 marks)

Write your answer in the space provided.

(Remember that the Reading Comprehension and the Translation provide almost all the words and structures that you will need.)

a) Three Frenchmen in ten are in favour of living in this region.

b) According to the first twelve firemen the fire had been accidental.

c) The house is 100 metres from the road on which there was an accident yesterday.

d) Almost all the books were destroyed in the fire.

e) "I am shocked that you say this," the policeman said.

5. REPRODUCTION STORY (30 marks)

To be written on examination stationery.

The story will be read to you twice. You may not take notes during the reading. You should aim to reproduce the story in about 120-130 words of French, and you will be marked for the style as well as the accuracy of your version.

NO ROOM AT THE INN

Jeanette en voyage - le moteur ne marche plus - seul hôtel - hésitation de la dame
- chambre - l'enseigne (*sign*) «hôtel» - question posée - réponse de la dame.

Eton College King's Scholarship Examination 2007

FRENCH (Supervisor's Copy)

5. *REPRODUCTION STORY. The time taken to read the passage twice is in addition to the one and a half hours given for the paper.*

NO ROOM AT THE INN

Jeannette, une jeune fille parisienne assez timide, voyageait toute seule quand l'autocar s'est soudain arrêté sur la route.

« Hélas, » a expliqué le conducteur aux passagers, « le moteur ne marche plus. Il est impossible de le faire réparer ce soir ; à cette heure le garage est fermé. Il y a un hôtel là-bas au centre du village où vous pourrez passer la nuit. Il est tout à fait impossible que vous vous trompiez parce qu'il n'y a qu'un seul hôtel. »

Jeannette, prête à pleurer, a pris sa valise et s'est mise en route tout de suite, car il était vingt et une heures et la nuit tombait déjà. En arrivant au village elle a sonné à la porte du plus grand bâtiment, et quand une dame est venue ouvrir Jeannette a balbutié : « Avez-vous une chambre libre, s'il vous plaît ? » La dame a semblé hésiter. « Comment ! » a fait Jeannette, « vous n'avez pas de chambre dans cet hôtel. L'autocar est tombé en panne et on ne pourra pas le faire réparer avant midi demain. »

« Mais si, » a interrompu la femme, « je vais prendre votre valise. Suivez-moi. » L'une après l'autre, elles sont montées à l'étage. Jeannette a été très impressionnée par le joli papier peint qu'elle voyait sur les murs. La dame l'a fait entrer dans une énorme chambre et Jeannette a été extrêmement soulagée d'apercevoir un grand lit au coin. La dame lui a souhaité bonne nuit, puis elle est sortie, laissant Jeannette seule pour la première fois depuis qu'elle avait quitté Paris. Elle s'est déshabillée, s'est couchée sans se laver et s'est bientôt endormie.

Le lendemain matin elle s'est réveillée et est allée ouvrir les rideaux. Aussitôt elle a aperçu à son horreur que le bâtiment d'en face portait l'enseigne «hôtel». Elle s'est vite habillée, puis elle s'est précipitée en bas, où elle a rencontré la dame qui était en train de lui apporter son petit déjeuner.

« Cette maison n'est donc pas un hôtel ? » a demandé Jeannette. « Mais non, » a répondu la dame, souriant. « Seulement je savais qu'il n'y avait plus de chambres libres à l'hôtel hier soir, et vous aviez l'air si malheureux que j'ai eu pitié de vous, et que je vous ai donné une chambre chez moi. »

[30 marks]

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GREEK

(One and a half hours)

Candidates should attempt ALL the questions on this paper.

1.

(a) Give the appropriate forms of the following articles and nouns:

- | | | | |
|-------|----------|-------------------|-----|
| (i) | ὁ δούλος | genitive plural | |
| (ii) | τὸ δῶρον | nominative plural | |
| (iii) | ἡ σοφία | genitive singular | |
| (iv) | το ὄνομα | dative singular | |
| (v) | ὁ ναύτης | accusative plural | [5] |

(b) Convert these articles and nouns into their opposite numbers, keeping them in the same case (i.e. if they are singular, make them plural; if they are plural make them singular):

- | | | | |
|------|-----------|--|-----|
| (i) | ὁ φύλαξ | | |
| (ii) | τὰ σώματα | | [2] |

(c) Translate into English:

- | | | | |
|-------|---------|--|-----|
| (i) | λύουσιν | | |
| (ii) | ἔλυσα | | |
| (iii) | λύσας | | |
| (iv) | λύων | | |
| (v) | ἔσμέν | | [5] |

(d) Translate into Greek:

- | | | | |
|-------------|-------|--------------------|-----|
| from λύω: | (i) | he looses | |
| | (ii) | they loosed | |
| | (iii) | he is being loosed | |
| from φιλέω: | (iv) | we love | |
| | (v) | they were loving | |
| from εἰμί: | (vi) | you (singular) are | |
| | | | [6] |

[Total for Question 1: 18]

2. Translate the following passage into English: **write your translation on alternate lines.**

Helen of Troy

ὁ Πάρις ἦν ὁ υἱὸς τοῦ Πριάμου (τοῦ ἐν Ἰλίῳ βασιλέως): ἔπεισε τὴν Ἑλένην, καλὴν γυναῖκα, ἀπελθεῖν εὐθὺς ἀπο τῆς Ἑλλάδος, καὶ βαίνειν εἰς τὴν Τροίαν. ὁ δὲ Ἀγαμέμνων, ἀδελφὸς τοῦ Μενελάου, τοῦ τῆς Ἑλένης ἀνδρός, στρατιὰν ἤθροίζε καὶ τοὺς Τρῶας ἐπολιόρκει. καὶ ἔμπροσθε τῶν νεῶν τείχος ὑψηλὸν ποιοῦσι καὶ βαθεῖαν τάφρον· ἐν δὲ τῇ μάχῃ, οἱ Τρῶες τοὺς Ἀχαιοὺς εἰς τὸ τείχος διώκουσιν. ὁ δὲ Ἀχιλλεὺς ὀργῶν καιόμενας τὰς ναῦς ἐκπέμπει τὸν Πάτροκλον· ὁ δὲ Ἔκτωρ αὐτὸν ἀποκτείνει. μετὰ δὲ ταῦτα, ὁ Ἀχιλλεὺς ὀργιζόμενος (ἐν ὅπλοις, ἃ ἐποίησεν Ἡφαιστος), αὐτὸς Ἔκτορι μάχεται, καὶ αὐτὸν ἀποκτείνει. τῷ δὲ δεκάτῳ ἔτει εἶλον τὴν Τροίαν οἱ Ἕλληνες.

Glossary

ὁ Ἀγαμέμνων, -ονος
οἱ Ἀχαιοί
ὁ Ἀχιλλεὺς
ὁ Ἔκτωρ
ἡ Ἑλένη
ἡ Ἑλλάς
οἱ Ἕλληνες
ὁ Ἡφαιστος
τὸ Ἴλιον
ὁ Μενελάος
ὁ Πάρις
ὁ Πάτροκλος
ὁ Πριάμος
ἡ Τροία
οἱ Τρῶες

Agamemnon
Achaeans, Greeks
Achilles
Hector
Helen
Greece
Greeks
Hephaestus
Ilion, Troy
Menelaus
Paris
Patroclus
Priam
Troy
Trojans

Vocabulary

ἄθροίζω
πολιορκέω
ἔμπροσθε
τὸ τείχος
ἡ τάφρος
καίομαι
ὀργίζομαι
αἰρέω, εἶλον
I gather together
I besiege
in front
wall
ditch
I burn
I am angry
I capture

[Total for Question 2: 20]

3. Answer the questions on the following passage. **Do not translate unless specifically asked to do so.**

Arion and the Dolphin

ἐπεὶ Περίανδρος ἐτυράννευε Κορίνθου, δεινότατόν τι ἐγένετο· ὁ γὰρ Ἄριων, κιθαρωδὸς ὢν τῶν Ἑλλήνων ἄριστος, ἐπὶ δελφίνος ἐξηνέχθη ἐπὶ Ταίναρον διὰ τοῦ πελάγους. οὗτος δὲ ὁ Ἄριων, ὡς λέγουσιν οἱ Κορίνθιοι, πολὺν ἤδη χρόνον παρὰ Περιάνδρῳ διατρίβων, ἤθελε πλεῦσαι
5 εἰς Ἰταλίαν· ἐργασάμενος δὲ ἐκεῖ χρήματα πολλά, ἤθελεν ὀπίσω εἰς Κόρινθον ἀφικέσθαι· ὀρμώμενος δὲ ἐκ Τάραντος, ἐμισθώσατο πλοῖον ἀνδρῶν Κορινθίων, τούτοις γὰρ μάλιστα ἐπίστευεν. καὶ οἱ μὲν ἐπεβούλευον, ἐκβαλόντες τὸν Ἀρίονα εἰς τὸ πέλαγος, ἔχειν τὰ χρήματα, ὁ δὲ αἰσθόμενος ἠξίωσεν αὐτοὺς τὰ μὲν χρήματα λαβεῖν, τοῦ δὲ βίου
10 φείσασθαι. ὡς δὲ οὐκ ἐπείσθησαν, ἐν μεγίστῃ δὴ ἀπορίᾳ ὢν, ἤτησεν τοὺς ναύτας εἶναι αὐτὸν στάντα ἐν τοῖς ἔδωλοις ἄδειν. καὶ ἐνδὺς πᾶσαν τὴν σκευὴν καὶ λαβῶν τὴν κιθάραν, νόμον τινὰ κάλλιστον διεξῆλθεν. ἔπειτα δὲ ἔρριψεν ἑαυτὸν εἰς τὴν θάλατταν. οἱ μὲν οὖν ναῦται ἀπέπλευσαν εἰς Κόρινθον· τὸν δὲ Ἄριονα δελφὶς ὑπολαβὼν ἐξήνεγκεν ἐπὶ Ταίναρον.
15 ταῦτα οὖν λέγουσιν οἱ Κορίνθιοι· καὶ Ἀρίονός ἐστιν ἀνάθημα χαλκοῦν οὐ μέγα ἐν Ταινάρῳ, ἐπὶ δελφίνος ἐπὶ ἄνθρωπος.

- (a) What are we told about Periander in line 1? [1]
(b) Translate δεινότατόν τι ἐγένετο (line 1). [2]
(c) What do we learn about Arion's skills as a lyre-player in line 2? [2]
(d) How long did he spend with Periander (line 4)? [1]
(e) After spending time with Periander what did Arion then want to do (lines 4-5)? [3]
(f) What is the source of this information (lines 3-4)? [1]
(g) What encourages Arion to want to go back to Corinth (lines 5-6)? [2]
(h) What arrangement does Arion make for his return journey and why (lines 6-7)? [1+2]
(i) What do the Corinthian sailors plan to do to Arion (lines 7-8)? [3]
(j) What does Arion ask the sailors to do (lines 9-10)? [2]
(k) Translate from ὡς δὲ to ἄνθρωπος (lines 10-16). [18]

[Total for Question 3: 38]

Glossary

ὁ Ἀρίων, Ἀρίονος	Arion
οἱ Ἕλληνες	Greeks
ἡ Ἰταλία	Italy
ἡ Κόρινθος	Corinth
οἱ Κορίνθιοι	Corinthians
ὁ Περίανδρος	Periander
ὁ Ταίναρος	Taenarus
ὁ Τάρας, -αντος	Tarentum

Vocabulary

ὁ κιθαρῳδός	lyre player
ἐξηνέχθη	'was carried to land'
τὸ πέλαγος	sea
διατρίβω	I spend time
ἐργάζομαι	I earn
ὀπίσω	back
ὀρμάομαι	I start from
μισθόομαι	I hire
ἄξιόω	I ask
φείδομαι (+ gen.)	I spare
ἔάω	I allow
στάντα (accusative)	'having taken his place'
τὰ ἔδωλια	rowing benches
ᾄδω	I sing
ἐνδύς (nominative)	'having put on'
ἡ σκευή	dress, attire
ὁ νόμος	tune
διεξέρχομαι	I play to the end
ἐκφέρω, ἐξήνεγκα	I carry to land
τὸ ἀνάθημα	offering
ἔπειμι	I am on

4. Translate the following sentences into Greek. Some of the words from **questions 2 and 3** may help you.

a) The Greeks are not willing to go into Troy. [4]

b) The Corinthians were besieging the citizens for a long time. [3]

c) The generals ordered the soldiers to pursue the beautiful daughter. [6]

d) Achilles was both wiser and more terrible than Agamemnon. [4]

e) When the big horse arrived at the gates of the city, Paris hurried angrily to his father's house. [7]

[Total for Question 4: 24]

Eton College King's Scholarship Examination 2007

SCIENCE (SECTION 1)

(60 minutes)

Candidate Number: _____

INSTRUCTIONS

*Write your candidate number, **not your name**, in the space provided above.*

You should attempt ALL the questions. Write your answers in the spaces provided: continue on a separate sheet of paper if you need more space to complete your answer to any question.

Allow yourself about 12 minutes for each question.

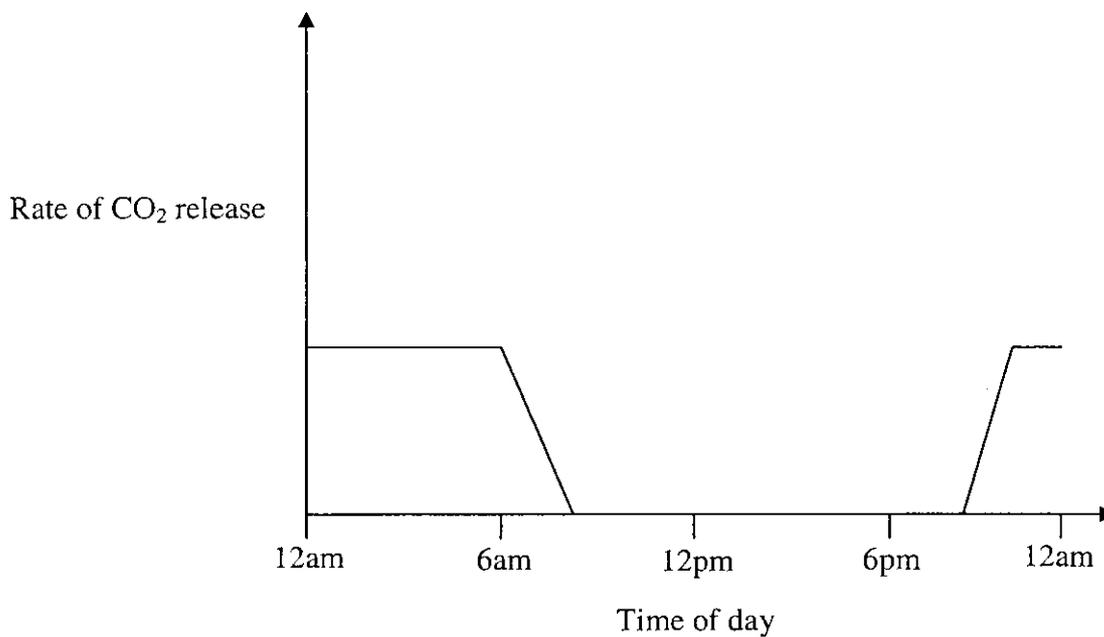
The maximum mark for each question or part of a question is shown in square brackets.

In questions involving calculations, all your working must be shown.

For examiners' use only.

1	2	3	4	5	TOTAL

1. The graph below shows the rate of carbon dioxide release from the leaf of a plant over a 24-hour period.



- (a) (i) Between which times is no carbon dioxide being released from the leaf?

_____ [1]

- (ii) Explain why no carbon dioxide is being released from the leaf between the times you have given in (i).

_____ [3]

- (b) On the graph above, add a line to show how you think the rate of **oxygen** release from the leaf would vary over the same 24-hour period.

[2]

The diagram below shows the layered composition of mature rainforest.

The effect of light intensity on the rate of oxygen release from the leaves of two different rainforest plants was investigated. The leaves were of equal mass and surface area, and they were healthy and clean.

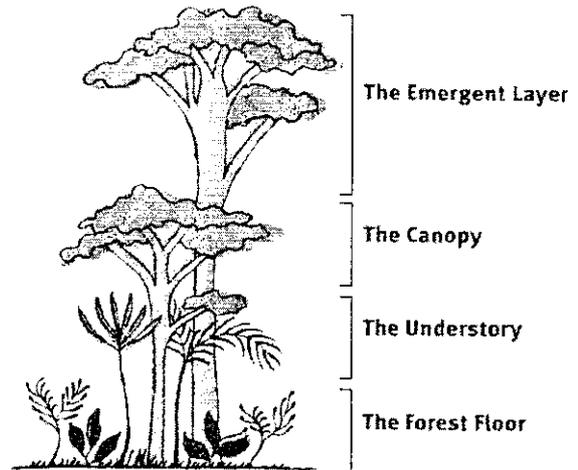
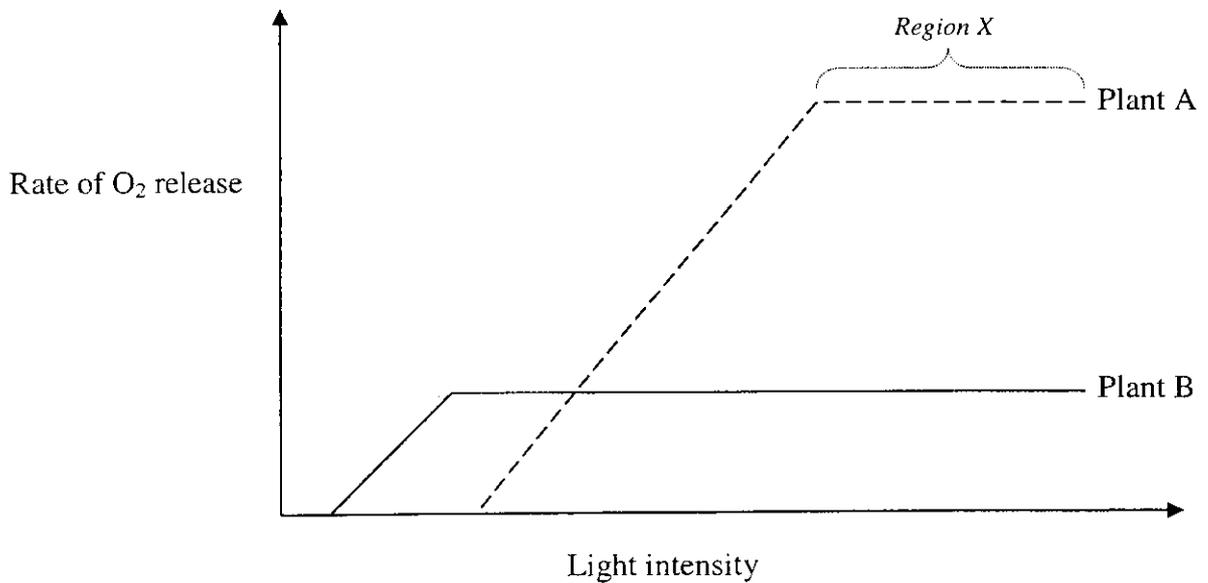


Diagram from www.sdmf.k12.wi.us

A graph of the results is shown below.



(c) Which plant (A or B) is most likely to be found in the forest floor layer? Explain your choice.

[3]

(d) Why does oxygen release level off in the region marked 'X' on the graph, rather than increase?

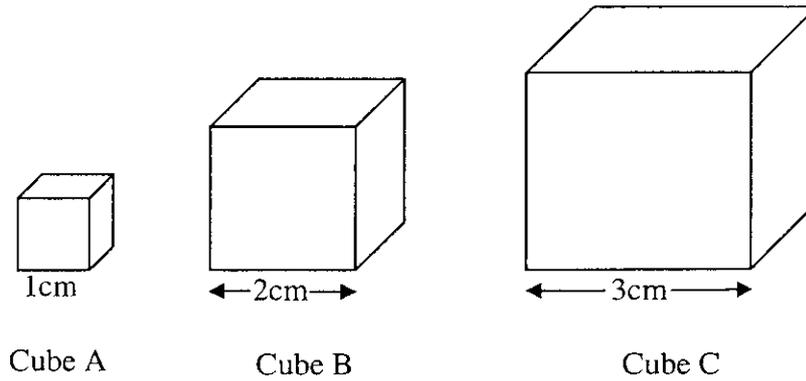
[3]

2. Most living organisms cannot regulate their internal temperature, which means it will vary with the external temperature. In cold environments such organisms may lose too much heat and in hot environments they may gain too much heat, either of which may be lethal. The size and shape of organisms allow them to adapt to such situations.

(a) Complete the table below, calculating

- i) the surface area
- ii) the volume
- iii) the surface area : volume ratio

for cubes B and C illustrated below (cube A has been done for you). [3]



	Surface Area (cm ²)	Volume (cm ³)	Surface Area : Volume Ratio
Cube A	6	1	6:1
Cube B			
Cube C			

(b) Explain why the surface area : volume ratio goes down as the cubes get bigger?

[2]

- (c) If these cubes represent living organisms, explain which would be most likely to survive in a very cold environment.

[2]

- (d) How could an organism increase its surface area to lose heat in a very hot environment without changing its volume?

[1]

- (e) The humpback whale lives in the cold waters of the northern Pacific off the Alaskan coast, where its food lives in abundance. Each year, however, the whales migrate south to the warmer waters of the Gulf of California where food is much scarcer. The females give birth and then the whales slowly return north as the young are nourished by the rich, fatty milk of their mothers. Explain this migratory habit in terms of surface area : volume ratios and heat loss.

[4]

3. A car accelerates from rest. It accelerates smoothly from 0 - 30m/s in 8 seconds. It then travels at 30m/s for 1km. The driver then sees a hazard ahead and performs an emergency stop. The car covers 55m whilst braking smoothly.

(a) For how long is the car travelling at a constant speed?

_____ [2]

(b) (i) What is the average speed of the car whilst it is accelerating?

_____ [1]

(ii) How far will the car travel whilst accelerating?

_____ [2]

(c) (i) What is the average speed of the car whilst braking?

_____ [1]

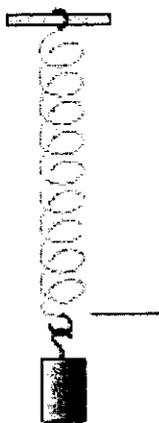
(ii) For how long are the brakes applied?

_____ [2]

(d) What is the average speed of the car for the whole journey?

_____ [4]

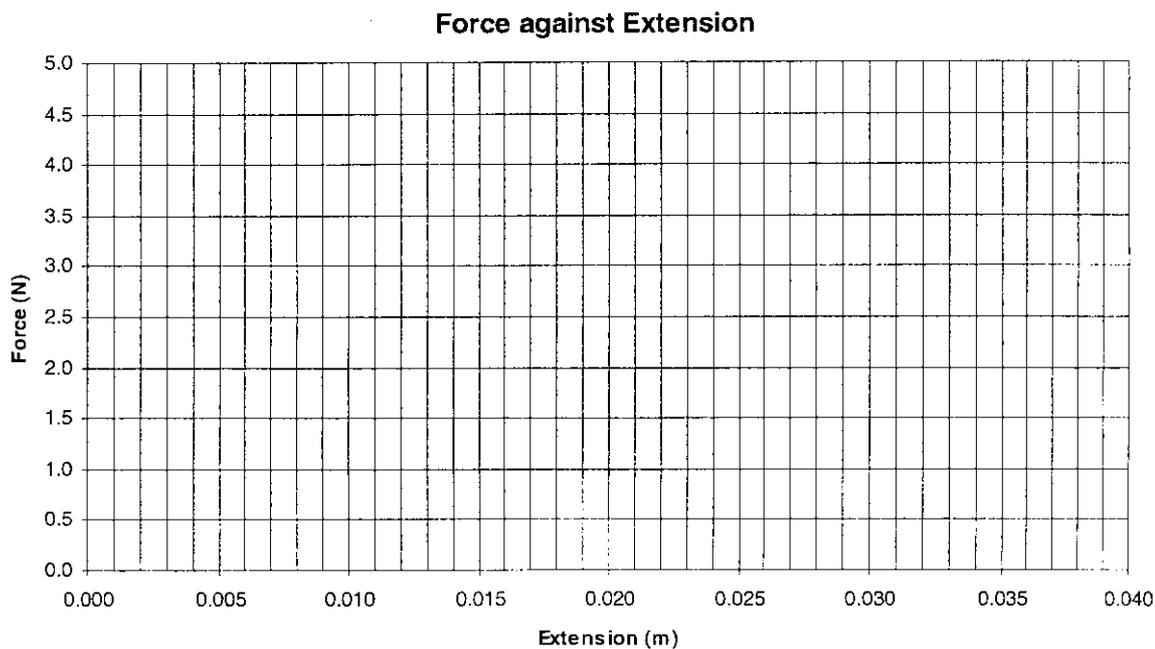
4. Various weights are suspended from a spring. The overall length of the spring is then measured. The results are shown in the table.



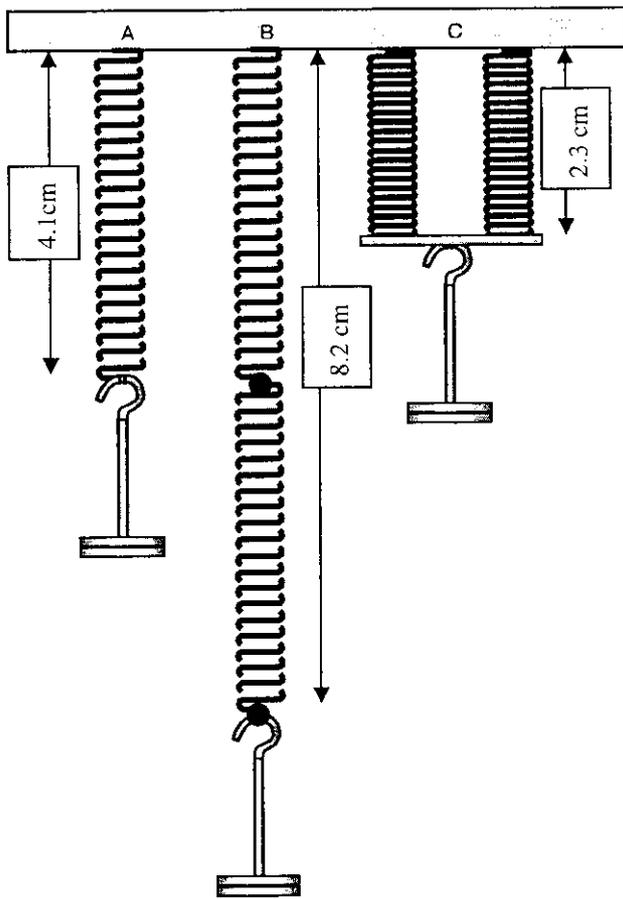
Weight (N)	Length (cm)	Extension (cm)
0	6.0	
1	6.4	
2	7.1	
3	7.5	
4	9.4	

Diagram modified from: www.saburchill.com/physics

- (a) Complete the extension column in the table above. [2]
- (b) Plot the data on the graph below and add a suitable line. [3]



- (c) Mark on the graph the approximate position of the elastic limit. [1]



The diagram to the left shows five springs arranged in three combinations. These springs are identical to one another, but are not the same as the spring described in part (a) above.

- A: a single spring
- B: two springs hung end to end
i.e. in series
- C: two springs hung side by side
i.e. in parallel

Each combination is shown carrying a total weight of 2N.

The overall length of the stretched springs is marked on the diagram.

Diagram modified from: www.iop.org

(d) Explain why two springs in parallel have a smaller extension than a single spring.

[2]

(e) Complete the following statements (by inserting a number in each space):

- (i) The extension of the two springs in series is times the extension of the single spring.
- (ii) The extension of the two springs in parallel is times the extension of the single spring.

[2]

(f) What is the length of each individual spring when it has no weight on it? Show your working or method of deduction.

[2]

5. Methane (CH₄) is a *fossil fuel*.

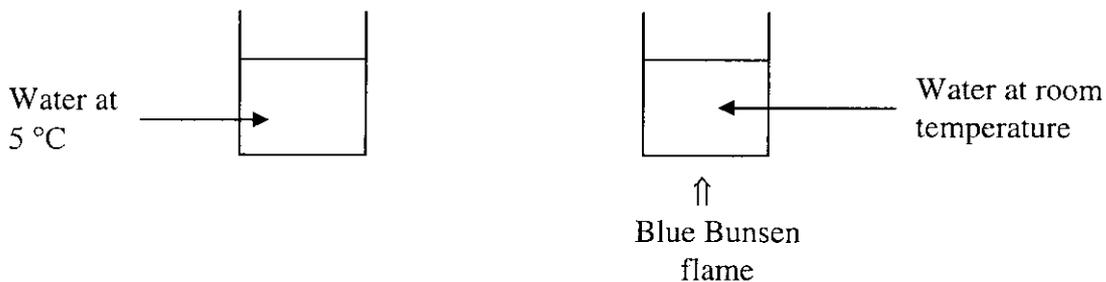
(a) Define the term *fossil fuel*.

_____ [2]

(b) When fossil fuels are burned completely they react with oxygen to release energy and produce two other compounds. Given the formula of methane is CH₄, name the two compounds that are formed when it reacts with oxygen completely.

_____ [2]

(c) Two beakers were set up as in the diagram below. The initial observation for both was that condensation formed on the outside. Explain this observation for each beaker.



Beaker containing water at 5 °C: _____ [2]

Beaker in the flame: _____ [2]

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SCIENCE (SECTION 2 - DATA ANALYSIS)

(30 minutes)

Candidate Number: _____

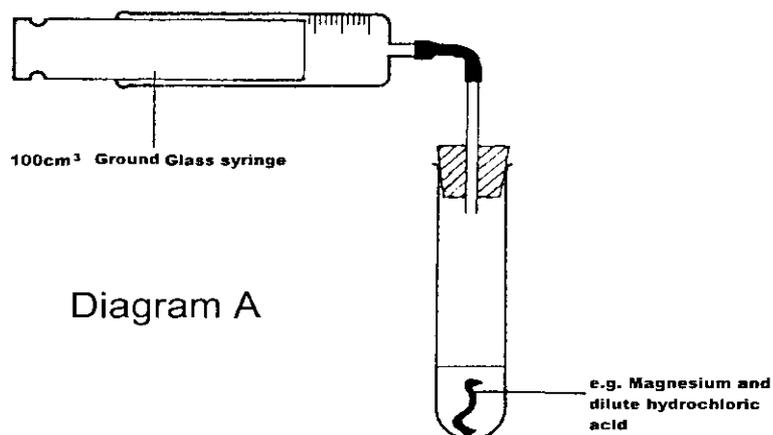
This paper describes the results of some experiments. Read the information and answer the questions in the spaces provided.

Additional materials required: Graph Paper.

For examiners' use only.

Total	
--------------	--

1. In order for a reaction to take place two reactants must collide with sufficient energy. Three students are performing the same set of experiments with magnesium (Mg) and hydrochloric acid (HCl). They used the apparatus shown in the diagram A below.



In their first experiment they all used 0.06 g of Mg ribbon **in one piece**, and 10 cm³ of 0.5 M HCl (where M is a unit of concentration), which was exactly the right amount of acid to react with all of the Mg. They measured the volume of hydrogen gas given off in cm³ every 10 seconds for just over a minute. Their results are in the table below.

Time (s)	0	10	20	30	40	50	60	70
----------	---	----	----	----	----	----	----	----

Volume (cm ³)	Student 1	0	21	26	34	35	36	36	36
	Student 2	0	24	37	46	53	57	60	60
	Student 3	0	24	36	48	53	58	59	60
	Combined results	0							

- (a) The results of student 1 are unusual. How might you account for this?

[2]

- (b) Combine the students' results to give as accurate a set of data as possible, enter these figures in the final row of the table. [2]

- (c) Explain how you combined the results of the three students in part (b) above.

[2]

(d) Plot a suitable graph of volume of hydrogen gas given off (cm^3) against time (s) on the graph paper provided, and draw a smooth curve through the points. [4]

(e) Why does the amount of hydrogen produced per second decrease with time?

[4]

(f) (i) Add to your graph a hand-drawn line (i.e. not plotted but drawn as accurately as you are able to from the information given) that shows the results you would expect if the experiment was repeated with everything the same except that **half the mass of powdered** magnesium was used. Label this line F.

[2]

(ii) Explain your reasons for drawing line F as you have.

[2]

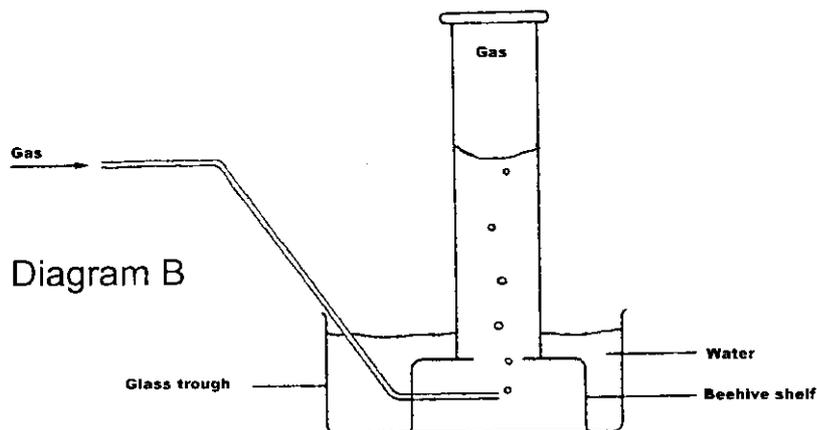
(g) (i) Add to your graph another line, this time for an experiment that was performed with 0.06g of magnesium as a single piece of ribbon (as originally) but with 15 cm^3 of 0.25 M acid. Label this line G. [2]

(ii) Explain your reasons for drawing line G as you have.

[3]

Total [23]

2. Some carbon dioxide gas was bubbled through the apparatus as shown in diagram B below.



- (a) Why is this not a very good method for collecting carbon dioxide?

[1]

- (b) Two students are arguing over whether they would expect the bubbles of gas to get bigger or smaller as they rise to the top of the water.

- (i) Suggest an argument for the bubbles getting smaller.

[1]

- (ii) Suggest an argument for the bubbles getting bigger.

[2]

- (iii) In fact, near the beginning of the experiment, the bubbles get smaller as they rise, but after a while they are seen to get bigger as they rise. Explain this observation.

[2]

Once the gas jar was full it contained about 500cm^3 of CO_2 ; some magnesium ribbon was burned in this gas.

A student wrote the following observations:

“2g of magnesium ribbon was held in a Bunsen burner flame with a pair of tongs until it caught fire and then plunged into the jar of CO_2 gas. It burned with a bright white light to leave a white solid. A few small flecks of a black substance were seen on the sides of the jar.”

- (c) What were the white solid and the black flecks observed by the student?

_____ [1]

- (d) In theory, even if all the CO_2 reacted, only about 1.7g of white solid should be produced in the reaction with the magnesium ribbon. However, when all the white solid was collected and weighed it was found to have a mass substantially more than this. How can this discrepancy be explained?

_____ [3]

- (e) It is obvious that heat and light are given out in this reaction. From where has this energy come?

_____ [2]

Total [12]

3. In questions 1 and 2 two different gases were collected. If we were able to count individual molecules we would discover that 1 litre of hydrogen gas (H_2) contained the same number of molecules as 1 litre of carbon dioxide gas (CO_2). However a CO_2 molecule is 22 times heavier than a H_2 molecule.

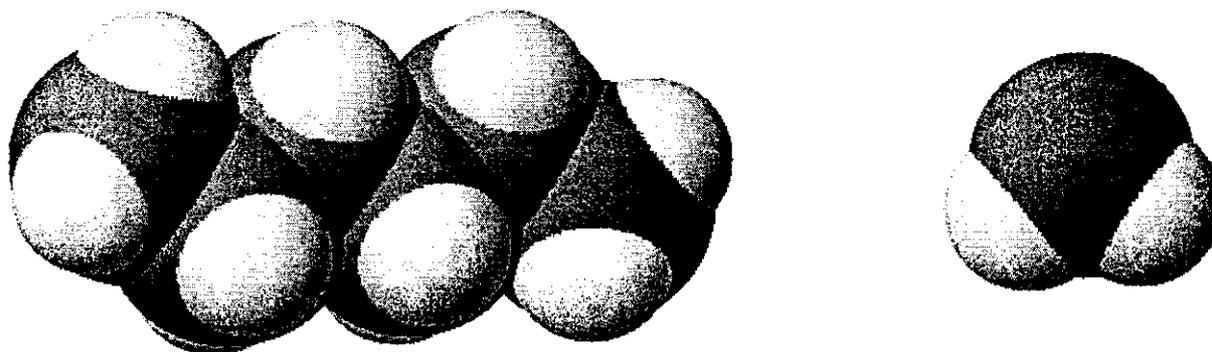
(a) What does this information suggest about the relative densities of the two gases?

_____ [1]

(b) What does this information tell you about the arrangement of molecules in a gas?

_____ [2]

The diagram below shows a molecule of hexane (C_6H_{14}) on the left, and on the right a molecule of water (H_2O). Liquid hexane and liquid water have approximately the same density.



(c) Would you expect a litre of water to contain more than, fewer than or the same number of molecules as a litre of liquid hexane? Explain your answer.

_____ [2]

Total [5]

[End of Paper]

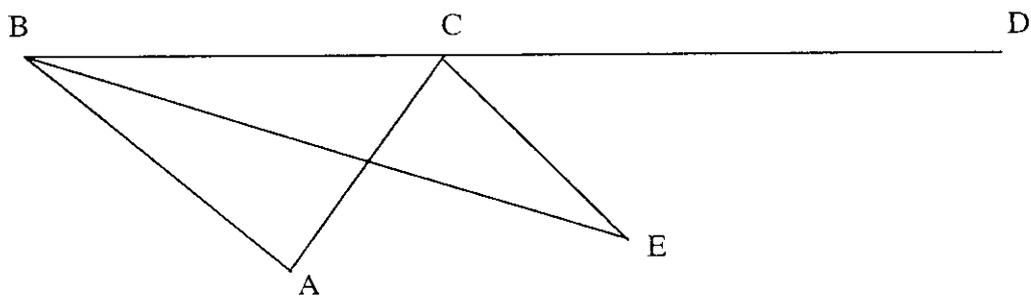
Eton College King's Scholarship Examination 2007

MATHEMATICS B

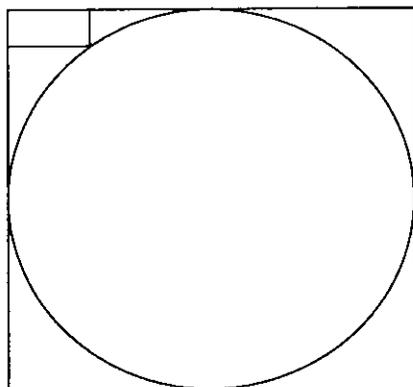
(One and a half hours)

Answer as many questions as you can. Each of the ten questions carries ten marks. Show all your working. Calculators are not allowed.

1.
 - (a) What is the value of $\sqrt{-((1 \times 2 \div (3 \times 4) - 5) \times 6 - 7) \div (8 \times 9)}$?
 - (b) When a barrel is 30% empty it contains 30 litres more than when it is 30% full. How many litres does the barrel hold when full?
 - (c) Split the number 68 into two parts such that $\frac{4}{7}$ of one part is equal to $\frac{2}{5}$ of the other.
2.
 - (a) If eight lorries can transport 450 tonnes of gravel in 12 hours, how long does it take six similar lorries to transport 720 tonnes of gravel, working at the same rate? Give your answer in hours and minutes.
 - (b) Three barrels contain mixtures of wine and water in the ratio 1:2, 3:2 and 2:5 respectively. A new mixture is made by scooping a proportion from each barrel in the ratio 3:5:4 respectively. What is the ratio of wine to water in the new mixture?
3. A teacher writes a positive whole number less than 4000 on the blackboard. One boy states that the number is a multiple of 2; a second that it is a multiple of 3; and so on consecutively until the eleventh boy says that it is a multiple of 12. The teacher remarks that all except two of the boys were right and, moreover, that the two who were wrong spoke one after the other. What was the number that the teacher wrote on the blackboard? You must explain your reasoning carefully in this question.
4. Solve the simultaneous equations:
 - (a) $\frac{2}{x} - \frac{3}{y} = 7, \quad \frac{8}{x} + \frac{9}{y} = 91$
 - (b) $2^{p+1} - 3^{2q+1} = 7, \quad 2^{p+3} + 3^{2q+2} = 91$
5.
 - (a) From coastguard station F a ship is seen on a bearing of 055° . As seen from the ship, the angle between the directions of coastguard station F and coastguard station G is 140° . What are the possible bearings of the ship from coastguard station G?
 - (b) In the diagram below, BCD is a straight line, BE bisects angle ABC and CE bisects angle ACD. Prove that angle BAC is twice angle BEC.



6. The diagram shows a circle, of radius r , inscribed inside a square and a 1cm by 2cm rectangle inscribed in the top left corner between the circle and the square.
- (a) Show that r satisfies the equation $r^2 - kr + 5 = 0$, where k is a constant to be found.
- (b) Hence, by completing the factorisation $(r-1)(\dots-\dots) = 0$, calculate the radius of the circle.
- (c) Find a similar equation, in the case where the rectangle is 1cm by 3cm, and verify that $r = 4 + \sqrt{6}$ satisfies this equation.



7. (a) Prove that the difference between a number ' ab ' and its reverse ' ba ' is never prime.
 (b) A *palindromic number* is one that reads the same when its digits are reversed, such as 5115. What is the largest six-digit palindromic number that is exactly divisible by 6?
8. Only two rectangles have dimensions that are integers and their area and perimeter are numerically equal. Let x be the length and y the width of the rectangles.
- (a) Show that x and y satisfy $(x-2)(y-2) = 4$ and hence find the dimensions of the rectangles.
- Using a similar approach we now wish to find all the rectangles whose dimensions are integers, and whose area is numerically equal to three times its perimeter.
- (b) Show that x and y now satisfy $(x-k)(y-k) = k^2$, where k is a positive integer to be found.
- (c) Hence find the dimensions of all the rectangles that have their area numerically equal to three times their perimeter.
9. When Roald Dahl had finished his first book, he noticed that the number of digits he used to number the pages (starting from page 1) was an exact multiple of the number of pages in the book. If the book contains over 100 pages but fewer than 1000:
- (a) Show that 192 digits are used to number the pages between 1 and 100 inclusive.
 (b) If there are x pages, show that the number of digits used to number the pages is $3x - 108$.
 (c) Hence find the number of pages in the book and the total number of digits used to number the pages.
10. (a) Using standard British coins (1p, 2p, 5p, 10p), it is possible to pay a total of 10p in many ways; for example ten 1p coins. In how many different ways can one pay 10p?
 (b) Hence or otherwise, in how many different ways can one pay 20p using standard British coins (1p, 2p, 5p, 10p, 20p)?

(End of paper)

Eton College King's Scholarship Examination 2007

HISTORY, GEOGRAPHY AND DIVINITY

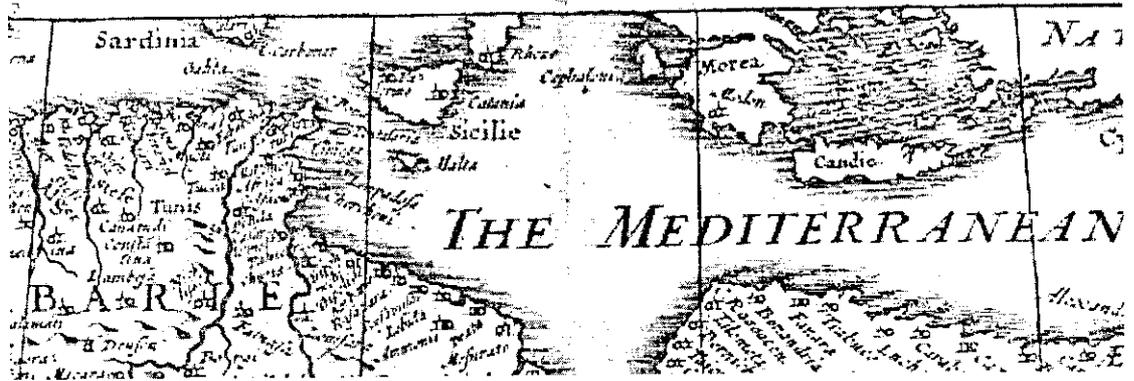
(One and a half hours)

The paper is divided into THREE sections. Candidates should answer THREE questions from at least TWO sections. Start each question on a NEW sheet of paper.

SECTION 1: HISTORY

1. Study the four sources below. They are sections from a map of Africa produced in Britain in 1626. What do they tell historians about how much British people knew about Africa around the time of 1626? [No prior knowledge of either the sources or the 1620s is required to answer this question]

Source A



Source B



(Turn over)

Source C



Source D



2. How able a king was Richard III?

3. Why was it not possible for Charles I and his enemies to reach a compromise during 1646-49?

4. In 1834 Richard Oastler described the workhouses that came with the New Poor Law as 'Prisons for the Poor'. Is this a fair assessment?

5. Choose any war that you have studied and explain why it happened.

6. Is History capable of finding the truth about the past?

SECTION 2: GEOGRAPHY

1. With reference to volcanic eruptions and earthquakes that you have studied, compare and contrast the methods used to reduce the human impact of these two types of hazards.
2. The United Nations predicts that by 2015 only two of the world's ten largest cities in population will be in more economically developed countries. Using examples, discuss the problems that can be expected to result from rapid urban growth in the developing world.
3. Using examples, discuss how human activities can increase the frequency and severity of flooding OR landslides.
4. With reference to an industry of your choice, discuss the geographical factors (both physical and human) that determine its present location in the UK.
5. Describe and explain the global distribution of places that experience very low levels of precipitation.
6. Al Gore, the former American Vice President, chose the title *An Inconvenient Truth* for his recent film on global warming. To what extent do you think that the problem of global warming can be thought of as an 'inconvenient truth'?

SECTION 3: DIVINITY

1. 'You trample on the poor and force him to give you grain... I hate and despise your religious feasts; I cannot stand your assemblies. Even though you bring me burnt offerings and grain offerings, I will not accept them. Let justice roll on like a river, righteousness like a river, righteousness like a never failing stream!'(Amos 5)

Discuss Amos' teaching on justice, judgement and religion.

2. 'You know that those who are regarded as rulers of the Gentiles lord it over them, and their high officials exercise authority over them. Not so with you. Instead, whoever wants to become great among you must be your servant, and whoever wants to be first must be slave of all.' (Mark 10)

To what extent do you think Jesus intended this teaching to be taken literally?

3. 'Every Jewish festival expresses something about God, nature and history.'

Discuss how this is so of *one* Jewish festival.

4. 'Over the centuries in Istanbul many churches have been converted into mosques.'

Discuss which features of a Christian church can be kept, altered, removed and added to in order for it to be made into a mosque.

5. Discuss what Christians mean when they say God is 'three persons'.

6. 'The Buddha can be anyone.'

Discuss the use of images in Buddhism.

7. 'Lead me from the real to the unreal.'

Discuss the Hindu teaching on achieving one's goal in life.

8. 'God is not born,
Nor will die to be born again, God is self-existent.
By grace of the Gurus God is made known to mankind.'
(Mul Mantra)

Discuss the Sikh teaching on God from the Mula Mantra.

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GENERAL II

(One and a half hours)

Answer two questions.

Marks will be awarded for clear, interesting and considered arguments.

Spend about 45 minutes on each question.

1. 'There cannot be good without evil.' Discuss.
2. Should terminally ill patients be assisted to commit suicide?
3. 'It is better to be a human being dissatisfied than a pig satisfied.' Discuss.
4. 'Atheists can also be fundamentalists.' Discuss.
5. 'There is still too much racism today.' Discuss.
6. How would our lives change if there were no art?
7. 'A civilised society would never allow the death penalty.' Discuss.
8. Is image more important than substance?
9. Should religious leaders take a greater role in politics?
10. 'Think globally, act locally.' Discuss.

[End of paper]

