



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Thursday 27 February 2014
11.00am to 12.00 noon*

ANCIENT GREEK

GENERAL INSTRUCTIONS:

Before you begin, state at the top of your answer sheet how long you have been studying Greek and for how many lessons per week.

Answer as many questions as you can. Use the whole paper for help with vocabulary.

Write your answers on A4 paper

NB. New words in this paper are only given in footnotes the first time they appear.

You should make an intelligent guess at words you do not know.

SECTION A (60 marks)

1 Identify the following; some are real, some are fictional.

- (a) Θησευς
- (b) Χριστιανω Ῥοναλδω
- (c) Μιλευ Κυρος
- (d) Ἄργος
- (e) Κατνισς Ἐυερδεεν [5]

2 Transliterate the following (i.e. write them in Greek letters). Long vowels are indicated with a macron (e.g. 'ē' or 'ō'). Remember to add breathings where appropriate:

- (a) plasma
- (b) chrōme
- (c) Hydra
- (d) Psychē
- (e) Athēna
- (f) Agamemnōn [6]

3 Imagine that each letter of the Greek alphabet is represented by a number ($\alpha = 1$, $\beta = 2$, etc.). Write down in Greek and translate the words represented by the following number sequences. Remember to add breathings where appropriate:

- (a) 1 - 4 - 5 - 11 - 21 - 15 - 18
- (b) 14 - 5 - 13 - 15 - 18
- (c) 10 - 7 - 17 - 20 - 14
- (d) 16 - 1 - 17 - 1 - 18 - 10 - 5 - 20 - 1 - 6 - 24 [8]

4 Translate into English:

- (a) που τα τεκνα ἐκαθευδεν; [4]
 - (b) οἱ κριται σοφωτεροι ἦσαν των πολιτων. [4]
 - (c) οἱ στρατιωται τους ξενους φευγοντας ἀπεκτειναν. [5]
 - (d) οἱ γεροντες προς το στρατοπεδον πεμπονται ὑπο του βασιλεως [6]
- [19]

5 Change the following nouns from plural to singular, keeping the same case. Write out the Greek singular form and give the basic meaning of each word.

Example: τους κηρυκας = τον κηρυκα (= herald)

- (a) των οἰκιων
- (b) οἱ φυλακες
- (c) τοις συμμαχοις [6]

- 6 **Change the following nouns from singular to plural, keeping the same case. Write out the Greek plural form and give the basic meaning of each word.**
- (a) το ὄνομα
 - (b) την τιμην
 - (c) ἡ ὁδος
- [6]**
- 7 **The following English words are derived from Greek words. What do they mean? If you recognise the Greek word(s) they come from, write it/them down (you may be credited for this, even if you cannot define the English word).**
- (a) hegemony
 - (b) polymath
 - (c) pandemic
 - (d) patronymic
- [4]**
- 8 **Write out any TWO of the following:**
- (a) The strong aorist active of μανθανω.
 - (b) ἡ νυξ in all its cases (singular & plural).
 - (c) ἡ θαλασσα in all its cases (singular & plural).
 - (d) The Definite Article in all genders and cases (singular & plural).
- [6]**

BONUS QUESTION:

Translate the following book title. You must get it absolutely correct to win the marks.

Ἄρειος Ποτήρ Καὶ Ἡ Τοῦ Φιλοσόφου Λίθος

[2]

SECTION B (10 marks)

Translate into Greek:

- (a) Chase the horse, brother! [3]
 - (b) Gods want honour [3]
 - (c) The brave poets speak wisely [4]
- [10]**

p.t.o. for Section C

SECTION C (30 marks)

Translate the passage into good English (25 marks) and answer the comprehension questions on the next page. Remember that the questions may carry clues that help you to complete the translation. You may find you can answer the questions, even if you can't translate the whole passage.

Write your translation on alternate lines.

Vocabulary is given on the next page.

You are strongly advised to write a translation in rough, and not to write out your neat copy translation until you have considered the whole story.

Some of the **names** in this story are mentioned in the description below the title (see below), and you should use the English description of the story to help you work out the Greek.

An Oracle fulfilled

When the God Apollo makes a prophecy, it always comes true. When Acrisius, king of Argos, learnt that a member of his family would kill him, he tried everything in his power to prevent it, but ultimately he was unable to, just as he was unable to prevent Zeus from transforming himself in his pursuit of the beautiful but heavily guarded Danae. Their child would prove to be the catalyst in Acrisius' downfall.

ὁ Περσεύς ἦν ὁ τοῦ τε Διὸς καὶ τῆς Δανάης παῖς.

ὁ μὲν παππὸς αὐτοῦ, Ἀκρίσιος ὀνοματι, ἔλθων πρὸς τὸ ἐν τοῖς Δελφοῖς χρηστήριον ἤκουσε παρὰ τοῦ Ἀπολλωνοῦ ὅτι, ἔαν ἡ θυγατὴρ υἴον τεκῆ, ὁ παῖς τὸν παππὸν ἀποκτενεῖ. καὶ ὁ Ἀκρίσιος ἠθέλεν κωλυεῖν τὴν μαντείαν. τὴν οὖν θυγατέρα ἐν τοῖς μελαθροῖς ἀκριβῶς ἐφυλάσσειεν.

ὁ δὲ Ζεὺς, μεταμορφῶν εἰς χρυσοῦν ὄμβρον διὰ τῶν μελαθρῶν ἐπέτασεν καὶ τέκνον Δανάῃ παρεσκεύασεν, καίπερ ὑπὸ τοῦ πατρὸς φυλάσσομενη.

ὁ Περσεύς, ἐπεὶ νεανίας ἦν, τὴν μεγάλῃν τιμὴν ἐδέξατο διὰ τὰ ἔργα ἀνδρεία τε καὶ πολλὰ, μάλιστα ὅτι τῇ ἀσπίδι ξέστη τὴν κεφαλὴν τῆς Γοργωνὸς Μεδουσᾶς ἐξεκοψεν.

ὕστερον, ἐπεὶ περὶ τοῦ χρηστηρίου ἐμαθεν ἔδοκει αὐτῷ μὴ ἐπανερχεσθαι πρὸς τὸ Ἄργος ὅτι τὸν παππὸν ἀποκτενεῖν οὐκ ἠθέλεν, ἀλλὰ ἐν τοῖς ἀγῶσιν Θεσσαλοῖσι ἀμιλλασθαι. τύχη μὲντοι ὁ Ἀκρίσιος ἤδη ἦλθεν πρὸς τοὺς αὐτοὺς ἀγῶνας ὡς θεασόμενος.

ὁ Περσεύς δίσκον ἐβάλλε. ὁ δίσκος τὸν Ἀκρίσιον ἐτύπεν. ὁ δὲ Ἀκρίσιος ἀπέθανεν. οὕτως ὁ Ἀπολλων τὴν μαντείαν ἐτέλεσεν.

Questions on the passage :

- (a) What is the name of Perseus' grandfather? [1]
(b) Where is Apollo's oracle? [1]
(c) What did Zeus turn himself into when he flew through the palace? [1]
(d) If Perseus looked directly at the Gorgon called Medusa he would be turned to stone.
How, according to this passage, did he get around this problem? [1]
(e) Briefly explain how Apollo's oracle was fulfilled in the end. [1]

Vocabulary

παππος-ου = grandfather

χρηστηριον-ου = oracle

Δελφοι-ων = Delphi

παρα + *genitive* = from

ὅτι = that (*the first time it appears*), because

ἐάν = if

τικτω, ἔτεκον (=aorist) = I bear, give birth to

μαντεια-ας = prophecy

μελαθρα-ων = palace

ἀκριβως = carefully, keenly

χρυσους, χρυση, χρυσουν = golden

ὀμβρος-ου = rain

πεταννυμι, ἔπετασα (=aorist) = I fly

καιπερ = although (*followed by participle*)

μαλιστα = especially

ἀσπις, ἀσπιδος = shield

ξεστος-η-ον = polished

ἐκκοπτω, ἐξεκοψα (=aorist) = I cut

ὕστερον = later

περι+ *genitive* = about, concerning

ἔδοκει αὐτῷ = he decided

ἐπανερχομαι = I return

ἄγων, ἄγωνος = contest

Θεσσαλος-α-ον = Thessalian (*Thessaly is a region of northern Greece*)

ἀμιλλασομαι = I compete

τυχη = by chance

μεντοι = however

ὡς θεασομενος = in order to watch

δισκος-ου = quoit, discus

τυπτω, ἔτυψα (=aorist) = I strike

οὕτως = in this way

τελεω, ἔτελεσα (=aorist) = I fulfil



HARROW
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ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Wednesday 26 February 2014
9.00am to 9.30am*

BIOLOGY

GENERAL INSTRUCTIONS:

You have 30 minutes to answer all of the questions.

You may use a calculator.

The maximum mark for this paper is 36.

Question 1

- Answer the following general knowledge multiple-choice questions. Underline the correct answer with a ruler and pencil as shown in the example below:

Example question: Which of the following diseases affects the lungs?

- i. diabetes
- ii. bronchitis
- iii. cholera
- iv. hepatitis

a) Which of the following animals is not a mammal? **(1)**

- i. bat
- ii. duck-billed platypus
- iii. dolphin
- iv. tortoise

b) Which of the following is a drug used to treat bacterial infections? **(1)**

- i. antibody
- ii. antiseptic
- iii. antibiotic
- iv. antidepressant

c) Which of these types of organism does not carry out photosynthesis? **(1)**

- i. fungi
- ii. plants
- iii. bacteria
- iv. algae

d) What is the average maximum lung capacity (volume) of an adult man? **(1)**

- i. 60 000 ml
- ii. 600 ml
- iii. 6 litres
- iv. 60 litres

e) What could you measure to calculate the rate of photosynthesis of a plant? (1)

- i. the mass of starch used per day
- ii. the volume of carbon dioxide used per minute
- iii. the volume of oxygen produced per hour
- iv. the amount of energy released per second

f) Which of the following is not a bone in the human leg? (1)

- i. femur
- ii. patella
- iii. tibia
- iv. mandible

g) Which of the following terms describes the scientific study of interactions amongst organisms and their environment? (1)

- i. zoology
- ii. pathology
- iii. geology
- iv. ecology

h) Dinosaurs are the ancestors of which group of vertebrates that exist today? (1)

- i. fish
- ii. mammals
- iii. amphibians
- iv. birds

i) For approximately how many years has there been life on Earth? (1)

- i. 3.6 billion
- ii. 36 million
- iii. 360 000
- iv. 360 million

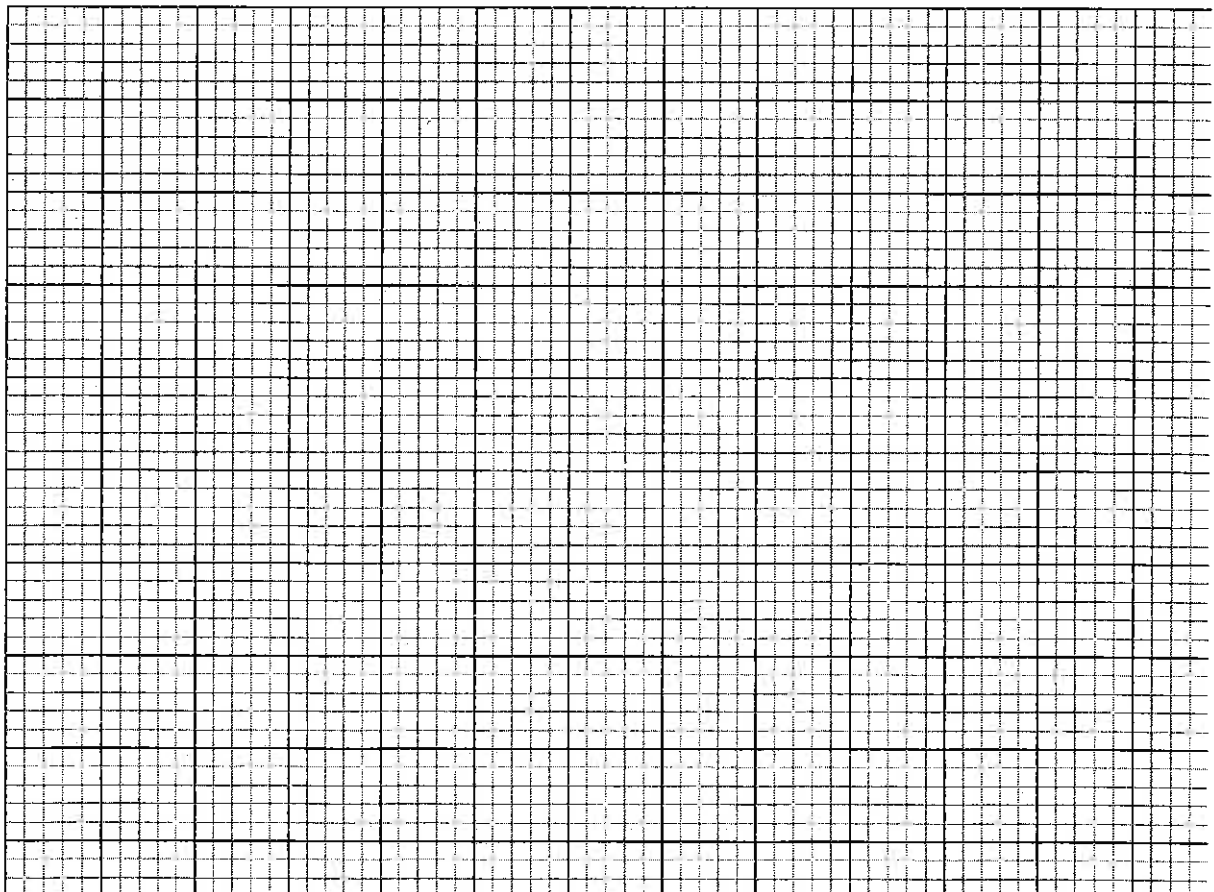
/ 9 marks

Question 2

- Every year the Royal Society for the Protection of Birds (RSPB) in the UK runs an event called the Big Garden Birdwatch in the last weekend in January. Members of the public are asked to observe the birds in their garden for one hour and record the highest number of each bird species seen at the same time. The RSPB collects all of this data and publishes the results. The table below shows the ten most common species recorded in 2013.

Rank	Bird Species	Average number per garden
1	house sparrow	3.7
2	blackbird	2.9
3	blue tit	2.6
4	starling	2.6
5	woodpigeon	2.0
6	chaffinch	1.9
7	great tit	1.4
8	goldfinch	1.4
9	robin	1.3
10	long-tailed tit	1.3

- a) Plot these results in a suitable graph or chart below. Make sure that the axes are fully labelled. (4)



b) Suggest why members of the public are asked to record the *highest number of each bird species seen at the same time* rather than the total number of each species seen in the one hour observation period. **(1)**

.....

c) Suggest why it is important that the data is collected in the same way every year. State one aspect of the recording process that should be kept the same. **(3)**

.....

• The table below shows the results for the previous year: 2012.

Rank	Bird Species	Average number per garden
1	house sparrow	4.5
2	starling	3.1
3	blue tit	3.0
4	blackbird	2.6
5	chaffinch	2.0
6	woodpigeon	1.9
7	goldfinch	1.6
8	great tit	1.6
9	robin	1.4
10	collared dove	1.3

d) Based on the data given for the top ten birds did the average garden contain more or fewer birds in 2013 compared to 2012? Give evidence for your answer. **(2)**

.....

e) The percentage decrease in the average number of chaffinches from 2012 to 2013 was 5%. What was the percentage decrease in the average number of house sparrows during this period? Show your working. **(2)**

Answer = %

f) Suggest two reasons for this decrease in the average number of house sparrows. (2)

.....

.....

.....

.....

• Two of the bird species recorded are shown below: a great tit (left) and a blue tit (right).



g) Give two features of the great tit shown in the image above that are characteristic of birds? (2)

.....

.....

h) Great tits and blue tits are closely related species. They are defined as separate species because they cannot breed successfully with each other. What factors might prevent blue tits from breeding successfully with great tits? (2)

.....

.....

.....

• Birds maintain a constant warm core body temperature that is, on average, approximately 3 °C higher than that of mammals.

i) What, approximately, is the average core body temperature of a bird? (1)

.....

j) Much of the heat energy that is needed to maintain a warm body temperature comes from the cellular process of aerobic respiration. Give the word equation for this reaction. **(2)**

.....

k) Describe and explain two reasons why birds such as great tits and blue tits struggle to maintain a warm body temperature in winter. **(4)**

.....
.....
.....
.....
.....

- Both species of tit compete for the same types of food: insects, seeds and nuts. Scientists observed birds feeding on bird feeders and every time a blue tit and great tit came to a feeder at the same time they recorded which bird remained on the feeder and which flew away. The results are shown in the table below.

		Species that remained on feeder	
		blue tit	great tit
Species that flew away	blue tit		23
	great tit	7	

l) Which species of bird competed more successfully for the food in the feeder? Suggest a reason for this. **(2)**

.....
.....
.....

/ 27 marks



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Wednesday 26 February 2014
9.30am to 10.00am*

CHEMISTRY

GENERAL INSTRUCTIONS:

*Answer **all** questions in the spaces provided.*

You will need a calculator.

1. An experiment was carried out to investigate how the solubility of sugar varied with temperature. 50cm³ of water was heated to the correct temperature, sugar was added in portions and the mixture stirred until no more sugar dissolved.

a) The following words can be used to describe the substances involved in the experiment.

Link the terms to the correct substances:

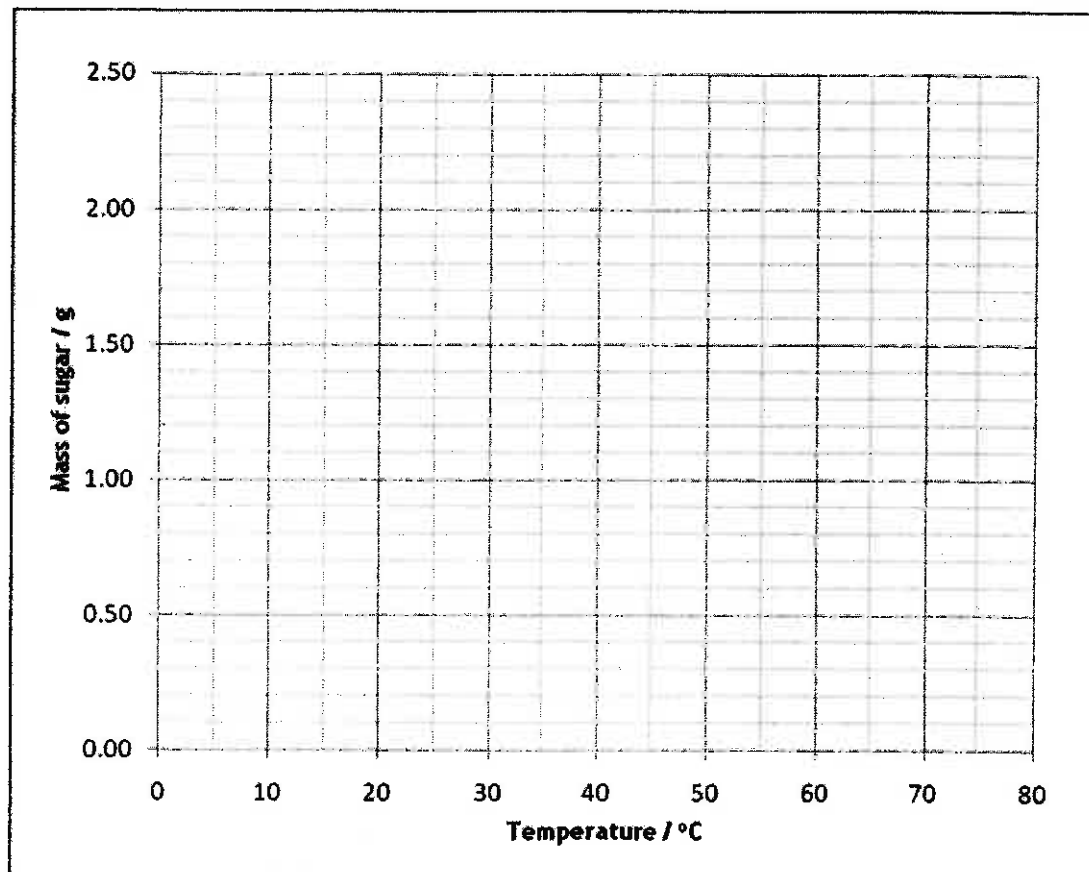
Solution		Water
Solute		Sugar-water mixture
Solvent		Sugar

[3]

b) The following data was collected:

Temperature / °C	20	30	40	50	60	70
Mass of sugar / g	1.00	1.30	1.50	1.75	1.80	2.20

Plot a graph of these results:



[3]

c) Describe the relationship between temperature and the mass of sugar dissolved that is shown by your graph.

.....
.....

[1]

d) i) Name the process that could be used to obtain pure water from the final mixture of sugar and water.

.....
.....

[1]

ii) Using this process and the mixture obtained at 40°C, 47cm³ of pure water was obtained. Calculate the percentage of water that has been lost.

.....
.....
.....
.....

[2]

[Total=10]

2. The following are general equations that describe how acids can react with certain types of substance:



a) Andrew added a metal compound to hydrochloric acid. The mixture fizzed until the substance disappeared. He suggested that the solid was a metal oxide.

Is Andrew correct? Explain your answer.

.....
.....

[2]

b) The gas produced is carbon dioxide.
How would you test for the presence of this gas in the laboratory?

.....
.....

[2]

c) Carbon dioxide is soluble in water and is a major contributor to acid rain.

i) Name the acid present in acid rain.

..... [1]

Some students collected a sample of rain water and wanted to test its pH. They were given the following indicators:

Indicator	Colour at low pH	pH at which colour changes	Colour at high pH
Thymol Blue	Yellow	9	Blue
Bromothymol Blue	Yellow	7	Blue
Phenolphthalein	Colourless	9	Pink
Methyl Violet	Yellow	1	Blue

ii) Predict the colour of the following indicator(s) when added to the rain water sample:

Bromothymol Blue

Phenolphthalein

Mixture of Thymol Blue and Methyl Violet [3]

iii) Water left on a windowsill for a week turns Bromothymol Blue yellow. Explain why.

.....

.....

..... [2]

[Total = 10]

3. Use information from the table to answer the following questions.

	Name of Metal	Colour of Metal	Colour of Metal (II) sulfate solution
↑	Magnesium	Grey	Colourless
	Zinc	Grey	Colourless
	Iron	Dark grey	Green
Increasing reactivity	Copper	Pink-brown	Blue

a) When zinc is added to magnesium sulfate solution, no reaction happens. Explain why.

.....

[1]

b) When iron fillings are added to copper (II) sulfate solution, a reaction takes place.

Describe the colour changes observed in:

i) the solid:

.....

[2]

ii) the solution:

.....

[2]

c) A student wanted to check the relative reactivity of magnesium and zinc by timing how long it took for a solution of copper (II) sulfate to turn colourless once a sample of the metal had been added.

Give two factors that the student must keep constant in order for the experiment to be a fair test:

1. [1]

2. [1]

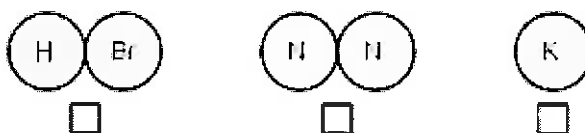
[Total = 7]

4. a) Define the term 'molecule'

.....
.....

[1]

b) Which of the following represents a compound?
Tick the correct picture.



[1]

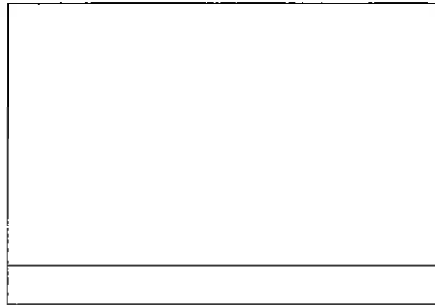
c) The following table shows the melting and boiling points for some common substances.

Complete the column to show the states of the substances at room temperature, 25°C.

Substance	Melting Point/°C	Boiling Point/°C	State at 25°C
Bromine	-7	59	
Hydrogen chloride	-114	-85	
Beryllium	1287	2468	

[3]

d) Draw the arrangement of particles of hydrogen chloride at 25 °C.



[1]

e) A balloon of volume 150 cm³ contains exactly 0.224kg of hydrogen chloride. Calculate the density of hydrogen chloride in g/cm³.

.....

.....

.....

.....

[2]

[Total = 8]

END OF TEST

NOW GO BACK AND CHECK YOUR WORK



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Monday 24 February 2014
4.30pm to 6.15pm*

ENGLISH

GENERAL INSTRUCTIONS:

*You should attempt both **sections**.
You are advised to spend 60 minutes on Section A (15 minutes
reading and making notes and 45 minutes writing) and 45
minutes on Section B.*

SECTION A: Reading, comprehension and commentary – 60 minutes, 50 marks

Read the following poems, both written about the city of London. You will want to read them more than once before answering the questions that follow. You can find definitions of unfamiliar words at the bottom of the page.

London

By William Blake

I wandered through each chartered street,
Near where the chartered Thames does flow,
A mark in every face I meet,
Marks of weakness, marks of woe.

In every cry of every man,
In every infant's cry of fear,
In every voice, in every ban,
The mind-forged manacles I hear:

How the chimney-sweeper's cry
Every blackening church appals,
And the hapless soldier's sigh
Runs in blood down palace-walls.

But most, through midnight streets I hear
How the youthful harlot's curse
Blasts the new-born infant's tear,
And blights with plagues the marriage-hearse.

Composed Upon Westminster Bridge, Sept. 3, 1802

By William Wordsworth

Earth has not anything to show more fair:
Dull would he be of soul who could pass by
A sight so touching in its majesty:
This City now doth, like a garment, wear
The beauty of the morning; silent, bare,
Ships, towers, domes, theatres, and temples lie
Open unto the fields, and to the sky;
All bright and glittering in the smokeless air.
Never did sun more beautifully steep
In his first splendour, valley, rock, or hill;
Ne'er saw I, never felt, a calm so deep!
The river glideth at his own sweet will:
Dear God! the very houses seem asleep;
And all that mighty heart is lying still!

chartered	restricted, not free
manacles	handcuffs, chains used to bind prisoners
appal	to horrify or disgust; literally to <i>make pale</i> – from Latin <i>pallere</i>
hapless	unfortunate
harlot	immoral woman
blight	to curse with illness
plagues	disease

1. Both poets are writing about the city of London. What is the most obvious difference in the way they depict London?
(10 points)

2. In William Blake's 'London', what types of people are shown to be suffering?
(10 points)

3. In 'Composed Upon Westminster Bridge' how does William Wordsworth show us the beauty of the city?
(10 points)

4. Find one example of an **interesting image** in 'London' and explain why it is so effective.
(5 points)

5. Find one example of an **interesting image** in 'Composed Upon Westminster Bridge' and explain why it is so effective.
(5 points)

6. Which poem do you think is a more truthful depiction of how the poets really saw London?
(10 points)

NOW START A NEW PIECE OF PAPER

SECTION B: Composition – 45 minutes, 50 marks.

Choose **one** of the following titles or themes for a composition. You may choose to write a piece of description **or** a short story **or** a poem **or** just a discussion of or commentary on the topic or theme. Spend some time planning before you start to write.

EITHER:

OR: *An Unexpected Guest*

OR: *'The pen is mightier than the sword'*

OR: *Art*

OR: *The End of Winter*

OR: *The Lost Minutes*

OR: *'Manners maketh a man'*



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ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Tuesday 25 February 2014
3.45pm to 4.45pm*

FRENCH

GENERAL INSTRUCTIONS:

You should start a new sheet of paper for each exercise.

*Please write all of your answers **on alternate lines***

The marks are shown at the end of each exercise. Use your time accordingly.

1. Translate into English. You should write ON ALTERNATE LINES. (30 marks)

Ce matin, nous sommes tous arrivés à l'école bien contents, parce qu'on va prendre une photo de la classe qui sera pour nous un souvenir que nous allons chérir toute notre vie, comme nous l'a dit la maîtresse. Elle nous a dit aussi de venir bien propres et bien coiffés.

C'est avec plein de brillantine sur la tête que je suis entré dans la cour de récréation. Tous les copains étaient déjà là et la maîtresse était en train de gronder Geoffroy qui était venu habillé en martien. Geoffroy a un papa très riche qui lui achète tous les jouets qu'il veut. Geoffroy disait à la maîtresse qu'il voulait absolument être photographié en martien et que sinon il s'en irait.

Le photographe était là, aussi, avec son appareil et la maîtresse lui a dit qu'il fallait faire vite, sinon, nous allions rater notre cours d'arithmétique. Agnan, qui est le premier de la classe et le chouchou de la maîtresse, a dit que ce serait dommage de ne pas avoir arithmétique, parce qu'il aimait ça et qu'il avait bien fait tous ses problèmes. Eudes, un copain qui est très fort, voulait donner un coup de poing sur le nez d'Agnan, mais Agnan a des lunettes et on ne peut pas taper sur lui aussi souvent qu'on le voudrait. La maîtresse s'est mise à crier que nous étions insupportables et que si ça continuait il n'y aurait pas de photo et qu'on irait en classe. Le photographe, alors, a dit : «Allons, allons, allons, du calme, du calme. Je sais comment il faut parler aux enfants, tout va se passer très bien.»

Sempé-Gosciny

Le Petit Nicolas, Éditions Denoël, 1960.

PLEASE START ANOTHER SHEET OF PAPER AND WRITE ON ALTERNATE LINES

2. Translate the following sentences into French. (30 marks)

- a) Mynameis Romain.
- b) He was sleeping.
- c) I had been there before.
- d) They came yesterday.
- e) The girls will be happy.
- f) It is going to be foggy.
- g) My car broke down.
- h) We finish the letter.
- i) This computer does not work.
- j) I used to run a lot.
- k) We are going to cry.
- l) The boys willsing.
- m) Theyget up early.
- n) You (sg./informal) went to bed.
- o) I had seen this movie.

PLEASE START ANOTHER SHEET OF PAPER AND WRITE ON ALTERNATE LINES

3. You recently came back from your summer holiday. Write an article for your blog to encourage your friends to visit the city or country you went to.(40 marks)

You should include details about:

- **Where** and **when** you went;
- The journey;
- What you **did** and what you **saw**;
- Why you recommend going there.

The account may be true or imaginary.

No credit will be given for pre-learnt or irrelevant material.

You should write using any tenses you consider appropriate. When you have finished, you should **CHECK YOUR WORK VERY CAREFULLY**, looking especially at verb forms, genders, adjectives and spelling.

Write approximately 130 words in French on alternate lines. Please do not write more than 150 words. You should concentrate on **accuracy** (and quality rather than quantity).



HARROW SCHOOL

ENTRANCE SCHOLARSHIP EXAMINATION 2014

GEOGRAPHY

February, 2014

Duration: 1 hour 30 minutes

*Questions **one** and **two** are compulsory and must be answered.
Answer **one** essay title from question three.*

An O.S. map extract is included with this examination.

QUESTION 1

Answer ALL of Question 1
[Spend 25 minutes on this section]

Use the OS map extract of Shrewsbury, and the map key provided, to answer the following questions:

- (a) (i) What is the name of the wood located in grid square 4916? [1]
(ii) What type of woodland is it? [1]
- (b) (i) What is located at grid reference 473148? [2]
(ii) Give the six figure grid reference of the nature reserve in 5010. [1]
- (c) A visitor uses the A488 road from the roundabout at 458106 to the roundabout at 487129 to get to Shrewsbury.
(i) In which direction is the visitor travelling? [1]
(ii) What is the distance to the nearest km along the A488 road between the two roundabouts? [2]
- (d) (i) Give **two** pieces of map evidence which suggest that the area in grid square 4912 is part of the Central Business District (CBD). [2]
(ii) Identify **two** land uses typically associated with the rural-urban fringe in grid squares 4909 and 4910. [2]
(iii) What is attractive about the rural-urban fringe to certain types of land use? [1]
- (e) Use map evidence to suggest why some buildings in the centre of Shrewsbury may be at risk from flooding. [3]
- (f) Suggest **two** strategies that are being used to reduce traffic congestion in Shrewsbury. [4]

[Total: 20 marks]

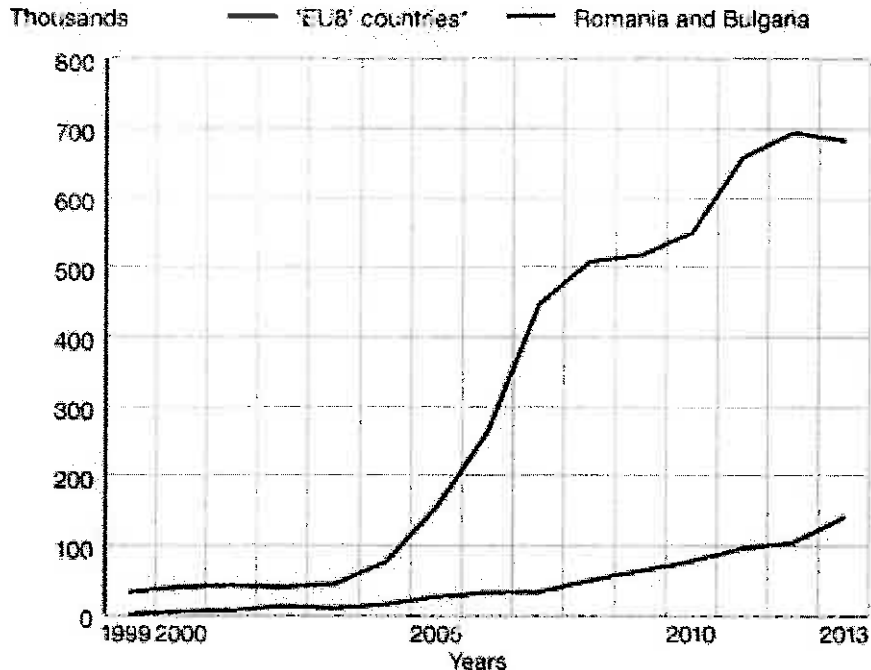
END OF QUESTION 1

QUESTION 2

Answer ALL of Question 2
[Spend 30 minutes on this section]

Study **Figure 1** below, a line graph showing the number of Eastern European workers in the UK between 1999 and 2013.

Eastern European workers in the UK



'EU8 countries': Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia.

Source: Labour Market Survey, ONS

Figure 1

- (a) Describe how the number of workers from 'EU8' countries in the UK has changed between 1999 and 2013. [4]
- (b) Explain why a person from one of the 'EU8' countries would want to work in the UK? [4]
- (c) From 1st January 2014, Bulgarian and Romanian citizens were free to live and work in the UK after controls in place since 2007 expired.
- (i) Explain the benefits to the UK of opening its doors to more Eastern European workers. [6]
- (ii) Suggest a challenge that an Eastern European worker might face in the UK. [2]
- (iii) Explain the possible benefits to the European country of origin as a result of its citizens coming to work in the UK. [4]

[Total: 20 marks]

END OF QUESTION 2

QUESTION 3

[Spend 35 minutes on this section]

Answer any **one** of the following essay questions and in each case refer to specific examples, places and processes.

Credit will be given for the use of named and located examples and the use of well-labelled sketch maps and diagrams where appropriate.

EITHER

- a) Failure to dredge rivers has been blamed for the persistent floods so far experienced on the Somerset Levels during 2014. To what extent is it possible to effectively manage river flooding?

[20]

OR

- b) What will geographers be most concerned with in 100 years' time?

[20]

OR

- c) How significant is the level of economic development of an area in determining the impacts from **either** a volcanic eruption, **or** an earthquake event?

[20]

OR

- d) More than half of the world's population now live in cities. Is the future of our economic growth confined to urban areas?

[20]

OR

- e) For any **one** agent of erosion that you have studied, describe and explain how it can alter the physical landscape?

[20]

[Total: 20 marks]

[Exam Total: 60 marks]

END OF EXAMINATION



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Wednesday 26 February 2014
11.15am to 12.45pm*

HISTORY

GENERAL INSTRUCTIONS:

There are three sections.

You are advised to spend approximately 30 minutes on each.

The quality of your answers is more important than the quantity, so spend 5-10 minutes thinking and 20-25 minutes writing for each section.

Each section is worth 30 marks in total.

SECTION A

The American politician Richard Nixon was a member of the Republican Party and President of the United States from 1969 to 1974. As a result of the Watergate Scandal he became the only US President ever to resign the office. This scandal occurred after a break-in at the rival Democratic Party's HQ in the Watergate office complex during the presidential election campaign of 1972, and the Nixon government's attempts to cover up its involvement in the break-in. The scandal led to the discovery of multiple abuses of power by Nixon and his supporters. In July 1973, as evidence mounted against the President's staff, it was revealed that Nixon had a tape-recording system in his office in the White House and had recorded many conversations. The US Supreme Court ruled that the President had to hand over the tapes to government investigators, and these tapes implicated him in the Watergate Scandal, revealing he had attempted to cover up the questionable goings-on that had taken place after the break-in. As a result, Nixon resigned the presidency on 9 August 1974. The scandal also led to the conviction and imprisonment of 43 people, including several of Nixon's top officials.

At the height of the scandal, before Nixon's tapes were generally known about, he had made a live television address to the American people, on 30 April 1973.

(1) Below is an adaptation of the President's speech of 30 April 1973.

How useful is it to a historian studying Nixon's presidency and the Watergate Scandal?

[30 marks]

Good evening. I want to talk to you tonight from my heart on a subject of deep concern to every American. In recent months, members of my government, including some of my closest friends and trusted aides, have been charged with involvement in what has come to be known as the Watergate affair. These include charges of illegal activity during the 1972 presidential election and charges that officials participated in efforts to cover up that illegal activity. The inevitable result of these charges has been to raise serious questions about the integrity of the White House itself. When I first learned about the Watergate break-in, I was appalled at the senseless, illegal action, and I was shocked to learn that some of my supporters were apparently among those guilty. As the investigations went forward, I repeatedly asked whether there was any reason to believe that members of my government were in any way involved. I received repeated assurances that they were not. Because of these continuing reassurances, and because I had faith in the persons from whom I was getting them, I discounted the stories in the press that appeared to implicate members of my government. However, new information then came to me which persuaded me that there was a real possibility that some of these charges were true. As a result, I personally assumed the responsibility for co-ordinating intensive new inquiries into the matter. I was determined that we should get to the bottom of the matter, and that the truth should be fully brought out – no matter who was involved. Today, in one of the most difficult decisions of my presidency, I accepted the resignations of two of my closest associates in the White House, Bob Haldeman and John Erlichman. I want to stress that in accepting these resignations, I mean to leave no implication whatever of personal wrongdoing on their part. But it is essential not only that rigorous legal and ethical standards be observed but also that the public have total confidence that they are both being observed and enforced by the President of the United States. They agreed with me that this move was necessary in order to restore that confidence. Whatever may appear to have been the case before, I want the American people to know beyond the shadow of a doubt that during my term as President, justice will be pursued fairly, fully and impartially, no matter who is involved. This office is a sacred trust and I am determined to be worthy of that trust. We must maintain the integrity of the White House, and that integrity must be real and not transparent. There can be no whitewash at the White House.

SECTION B

Answer **ONE** of these questions. Each question is worth 30 marks.

Either

(2) 'Victory in war always goes to the side with better leadership.' How far do you agree with this statement? Use any period or periods of History you have studied to answer this question.

or

(3) 'Twentieth-century history is more worthy of study than ancient or medieval history.' How far do you agree with this statement? Use any period or periods of History you have studied to answer this question.

SECTION C

(4) On the back page of this examination paper is a famous chart, drawn by the French statistician and civil engineer Charles Minard in 1869. It is a graphic representation of the advance of Napoleon's army on Moscow in 1812 and its subsequent retreat: the advance is shown in pink and the retreat in black. Among other things it shows the number of Napoleon's troops, their movements and the temperatures they encountered.

Either:

(a) Comment on the ways in which Minard's chart is more useful to a historian than a written account of Napoleon's 1812 campaign.

Or

(b) Draw a diagram of your own that illustrates a historical event you have studied.

Carte Figurative des routes successives en Russie de l'Armée Française dans la Campagne de Russie 1812-1813.

Dessiné par M. Moutard, Amputé. Gravé sur bois en Chromo-lithographie, le 20 Novembre 1869.

Les routes successives prises par les Français pendant la campagne de Russie sont indiquées par des lignes noires et rouges. Les routes successives prises par les Russes sont indiquées par des lignes grises. Les routes successives prises par les Français pendant la campagne de Russie sont indiquées par des lignes noires et rouges. Les routes successives prises par les Russes sont indiquées par des lignes grises.

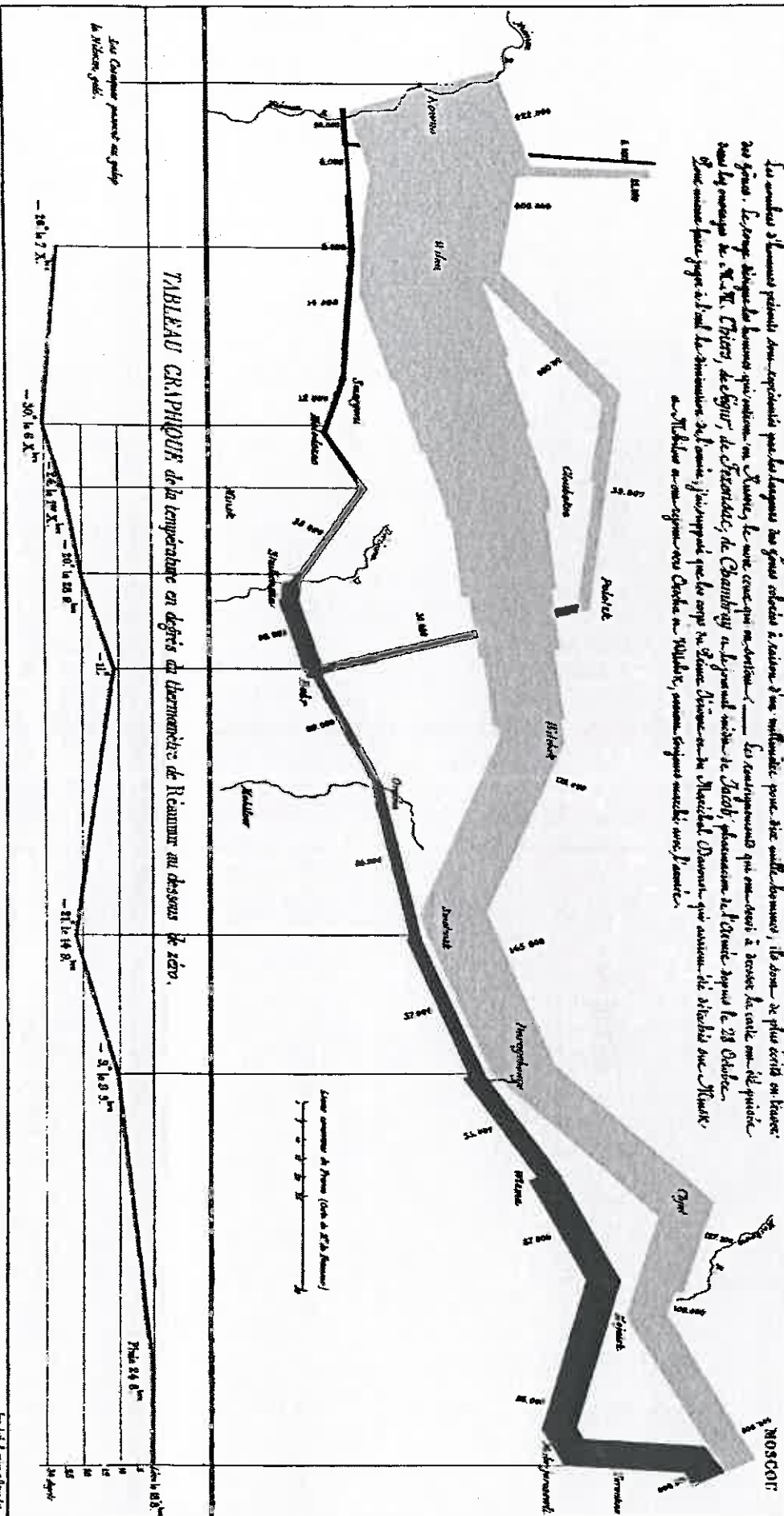


TABLEAU GRAPHIQUE de la température en degrés de thermomètre de Réaumur au dessous de zéro.

10° h 3 X ^m	20° h 3 X ^m	30° h 3 X ^m	40° h 3 X ^m	50° h 3 X ^m	60° h 3 X ^m	70° h 3 X ^m	80° h 3 X ^m	90° h 3 X ^m	100° h 3 X ^m
10	12	14	16	18	20	22	24	26	28

Amoy par Angoulême, à Paris, chez Moutard, 17, rue de la Harpe.

Imp. de la République.



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

Wednesday 26 February 2014
2.15pm to 3.45pm

LATIN

GENERAL INSTRUCTIONS:

You must attempt questions one (30 marks), two (30 marks), three (25 marks), which all cover the same story, split into three passages.

You must then do **either** question four (harder passages of Latin on the same story) **or** question five (English to Latin sentences).

If you have time, you may attempt both questions four and five. If you do this, the higher mark will be counted, but a strong performance on both optional questions will be taken into consideration.

You are not permitted to write anything down for the first 10 minutes of the examination.

This time should be spent reading the examination paper.

It will help if you study the Latin passages and the English introduction to each passage during the first 10 minutes. You are also advised to read all the footnotes carefully, as they contain helpful information.

New words in this paper are only given in footnotes the first time they appear. You should make an intelligent guess at words you do not know, using any hints in the footnotes or in

the English introduction to each passage. Try to base any guesses on elements in the sentence that you definitely DO know and make sure they make sense in context.

Question One

Please note that the Latin passages in Questions One - Three form a continuous story.

Read the following passage and answer the questions on the facing page.

The Gauls Attack Rome (1): The Gauls Rampant.

In 390BC Rome was a fairly small city-state, separate from most of Italy. The Gauls originally intended only to invade northern Italy, but an encounter with some Roman ambassadors convinced them to change their intentions. After the defeat of the Roman army at the river Allia, Rome came very close to being utterly vanquished by the invading Gauls.

1 olim Galli, qui milites ingentes ac saevissimi erant, in Italiam profecti sunt ut urbes caperent et
2 aurum auferrent.¹ legati² Romani ad castra Gallorum missi sunt, qui tamen principes³ Gallorum
3 necaverunt nec foedus⁴ petiverunt. Galli igitur irati erant. Romam statim contendebant.
4 maior pars urbis impetu improvise⁵ capta est. nam exercitu Romano prope flumen Alliam victo,
5 et militibus Romanis passim⁶ fugientibus, Galli portas urbis sine custodibus invenerunt et
6 domus templaque populabant.⁷
7 nobiles Romani, viri fortes sed seniores quam ut⁸ effugerent, Gallos in foro silentiose ac
8 immobiliter exspectabant. unus ex iis, Marcus Papirius nomine, Gallum quendam⁹ scipione
9 eburno incussit¹⁰ barbam¹¹ suam tangere conantem. Papirium igitur, et postea omnes alios
10 nobiles, Galli necaverunt.
11 interea pauci milites Romani qui in Capitolio - nondum¹² capto - se celaverant¹³ tristes, urbem
12 suam igne¹⁴ gladioque deletam spectantes, in eo loco constituerunt aedificia, deos, nomen
13 Romanum defendere.



¹ aufero, auferre, abstuli, ablatum = I take away, steal

² legatus, legati (m) = ambassador

³ princeps, principis (m) = chief

⁴ foedus, foederis (n) = pact, agreement

⁵ improvisus-a-um = unexpected, surprise

⁶ passim (advb) = in every direction

⁷ populo, populare, populavi, populatus = I lay waste to, ravage, plunder

⁸ quam ut + comparative of adjective x = 'too x to.....'

⁹ quidam, quaedam, quoddam = a certain

¹⁰ incutio, incutere, incussi, incussus = I strike

¹¹ barba, barbae (f) = beard

¹² nondum = not yet

¹³ celo, celare, celavi, celatus = I hide

¹⁴ ignis, ignis (m) = fire

Questions on Passage One:

- a) How are the Gallic troops described? [2]
- b) Why did they set out into Italy? [2]
- c) Explain how the Roman *legati* did not behave appropriately. [3]
- d) What emotion triggered the Gallic response, and how soon did they act? [2]
- e) How much of the city was captured, and what key landmark remained uncaptured? [2]
- f) Using all the detail available, describe how the Gauls secured their victory and profited from it. [4]
- g) What do you find to admire in the Roman nobles? [4]
- h) Why did Marcus Papirius strike the Gaul with his ivory cane? [2]
- i) Was Papirius's action foolhardy? Justify your answer. [2]
- j) Why were the Romans on the Capitol sad? [3]
- k) What decision did they make? [3]
- l) Give a better translation than 'name' for *nomen* (line 12). [1]
- m) Two noun cases do not occur in this passage. What are they? [2]
- n) From the passage, give in Latin one example of each of the following:
- (i) An imperfect subjunctive [1]
 - (ii) An adverb [1]
 - (iii) A perfect passive participle [1]
 - (iv) A deponent verb [1]
 - (v) A pluperfect indicative [1]
 - (vi) A present participle [1]
- o) Explain the case of *Romam* (line 3). [1]
- p) Give the nominative singular of the Latin word for "cane". [1]

[40 marks]

P.T.O.

Question Two

Translate the following passage into good English. Write your translation on alternate lines.

The Gauls Attack Rome (2): A Secret Message And Its Consequences

Despite taking the rest of the city easily, the Gauls were unable to capture the Capitoline Hill, where the few remaining Roman soldiers were holding out, when a message arrived via a hidden footpath.

tertia nocte profugi¹ Romani, qui Veios² se receperant,³ iuvenem, Pontium Cominum nomine, miserunt ut praecepta⁴ militibus qui in Capitolio manebant traderet.

ille, incubans cortici,⁵ secundo Tiberi⁶ denatavit. per semitam⁷ occultam quae a Gallis nondum inspecta erat ad summum Capitolium ascendit. praeceptis traditis in eadem semita rediit Cominus.

Galli tamen reditum⁸ eius animadvertunt,⁹ semitam notaverunt,¹⁰ consilium¹¹ ceperunt.

proxima nocte Galli Romanis in Capitolio silentiose appropinquabant. cum non solum custodem fefellissent¹² sed etiam canes, ad summum, gladiis hastisque armati, pervenerunt.

potuerant custodem fallere quod ille obdormivit qui vigilare¹³ debebat.

[25 marks]



The Capitol, or Capitoline Hill, as it appeared in the 70s AD

¹ profugus, profugi (m) = exile

² Veii, Veiorum (m.pl) = Veii (a town on the river Tiber, just north of Rome)

³ se recipere = to retreat, fall back

⁴ praeceptum, praecepti (n) = instruction

⁵ cortex, corticis (m) = strip of cork

⁶ secundo flumine = downstream

⁷ semita, semitae (f) = footpath

⁸ reditus, reditus (m) = return

⁹ animadverto, animadvertere, animadverti, animadversus = I notice

¹⁰ noto, notare, notavi, notatus = mark, make a note of

¹¹ consilium, consilii (n) = plan

¹² fallo, fallere, fefelli, falsus = I deceive

¹³ obdormio happens just before dormio; vigilo is its opposite...

Question Three

Read the following passage and answer the questions below.

The Gauls Attack Rome (3): Rome Saved.

1 Galli tamen Capitolium non ceperunt. anseres¹ enim, qui in Capitolio habitabant ubi
2 stabat templum Iunonis² (hae aves³ sacrae illi deae sunt), clamore alarumque⁴ crepitu
3 excitaverunt Marcum Manlium virum fortissimum ac clarissimum, qui tribus ante annis consul
4 fuerat. ille statim vidit Gallos montem ascendisse et, gladium scutumque⁵ rapiens,⁶ dum comites
5 sui trepidunt, Gallum primum qui iam in summo stabat umbone⁷ concussit.⁸
6 hoc Gallo cadente,⁹ reliqui quoque de summo prolapsi¹⁰ mortui sunt. ita Manlius auxilio
7 anserum Romam servavit.

Questions on Passage Three:

- a) Why were there geese on the Capitol? [3]
- b) Using the meaning of *alarum* work out the meaning of *crepitu* (line 2). [1]
- c) Give a better translation of *excitaverunt* than 'they excited'. [1]
- d) Translate the two adjectives used to describe Marcus Manlius. [2]
- e) How many years previously had Manlius been consul? [1]
- f) How many Gauls were standing on the top of the Capitol when Manlius woke up? [1]
- g) How is it clear in the passage that Manlius acted decisively? Give details in your answer. [4]
- h) From line 6 (*hoc Gallo...mortui sunt*) explain in your own words how the rest of the Gauls died. [2]
- i) Translate the final sentence (*ita...servavit*). [5]
- j) Give in Latin an example of a perfect infinitive from this passage. [1]
- k) Other than Manlius, which character or group of characters in this story do you admire the most? Give two reasons for your answer. [4]

[25 Marks]

P.T.O.

¹ anser, anseris (m) = goose

² Iuno, Iunonis (f) = Juno (wife of Jupiter and one of the deities worshipped in temples on the Capitoline)

³ avis, avis (f) = bird

⁴ ala, alae (f) = wing

⁵ scutum, scuti (n) = shield

⁶ rapio, rapere, rapui, raptus = I seize

⁷ umbo, umbonis (m) = boss (of a shield)

⁸ concussit... a different compound form of this verb occurs elsewhere in the examination paper; the two verbs have the same meaning.

⁹ cado, cadere, cecidi, casus = I fall

¹⁰ prolabor, prolabi, prolapsus sum = I slip

Remember, you can attempt either Question Four or Question Five. If you attempt both, the higher mark will be counted, but additional credit may be given if both are completed well.

Question Four

Read the following passages. They cover the story which is featured in Passages One, Two and Three. Then answer the questions that follow.

A:

inde qua proximum fuit a ripa, per praeruptum eoque neglectum hostium custodia saxum in Capitolium evadit, et ad magistratus ductus mandata exercitus edit.... eadem degressus nuntius Veios contendit.

B:

stabat pro templo et Capitolia celsa tenebat,
Romuleoque recens horrebat regio culmo.
atque hic auratis volitans argenteus anser
porticibus Gallos in limine adesse canebat;

- a) One passage is by the poet Virgil, the other is by the historian Livy. Which is which? [2]
- b) Who is the main character in Passage A? [1]
- c) Who else, apart from soldiers, do we discover were present on the Capitol? [1]
- d) What word in Passages One-Three is used instead of *mandata* in Passage A? [1]
- e) Who is the subject of the verbs in the first line of Passage B? [1]
- f) Passage B describes scenes on a shield. What two metals are used for these scenes? [2]
- g) Study this image:



- i. Who is holding the sword? [1]
- ii. What is the French word for geese? [1]

Question Five

Translate the following sentences into Latin. Use the vocabulary given earlier in the paper.

- a) In the middle of the night the Gauls tried to climb to the top of the Capitol silently. [5]
- b) Soon the defeated Gauls retreated out of Italy. Everyone praised Manlius. [5]

Total Marks: 100



HARROW
SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Tuesday 25 February 2014
9.00am to 10.30am*

MATHEMATICS I

GENERAL INSTRUCTIONS:

You may attempt all questions if you have time, but greater credit will be given for complete solutions.

Show all your working.

Calculators may be used.

1. Simplify the following:

(a) $4p + 6 - 2(8 - p)$

(b) $\frac{m}{12} + \frac{5m}{8}$

(c) $3(a - 2b) + 7(3b - 4a)$

2. The cost C in pounds of a telephone bill is dependent on the number of calls made, n .

(a) Ringcom phone company says it will charge 13p per call plus a flat rate charge of £21.52, their formula is:

$$C = 0.13n + 21.52$$

(i) How much is the bill when 128 calls are made?

(ii) If the bill is £52.46 then how many calls were made?

(b) Dialaphone company calculates phone bills by charging 17p per call together with a flat rate charge of £13.24

(i) Write a formula to calculate the cost C in pounds of a phone bill from Dialaphone for n calls.

(ii) I reckon I make about 500 calls a year; which phone company would be better for me to use?

(iii) How many calls would I need to make a year for it not to matter which phone company I use?

3. **Answer all parts of this question on the sheet containing figure 1.**

The diagram on figure 1 shows a pattern made up of a repeated motif. These motifs are labelled A to E .

(a) State the **single** transformation that will take

(i) A to E

(ii) A to C

(iii) B to D

(b) On figure 1 draw F and G where

(i) F is an enlargement of A by scale factor 4 centre the origin

(ii) G is an enlargement of E by scale factor 2 centre $(21, -2)$

(c) Describe the **single** transformation that will take G to F .

4. (a) List the set of integers (whole numbers) x for which both $(x + 2\frac{1}{2})$ is positive and $(x - 1\frac{1}{2})$ is negative.

(b) Solve the inequalities (i) $\frac{x}{3} + 9 \geq \frac{x}{2} - 1$

(ii) $3x - 21 \geq 99$

(c) Find a prime number which satisfies **both** of the inequalities in (b).

5. A wire is shaped to form an enclosed semicircle, as shown below, with an area 180cm^2 . The wire is reshaped into a square, what is the area of the square?



6. Simplify the following

(a) $\frac{9}{t} + \frac{3}{2t}$

(b) $x^2(4 - x) - x(3 - x^2)$

(c) $x(2x + 3(x - 4(x + 5)))$

(d) $\frac{8m^2 - 6m}{2m}$

7. In 2013 as part of a survey it was found that, compared to 2012, the number of cars exported from the UK to France had increased by 8%, and the average price per car (in £) had fallen by 12%.
- (a) If the average price per car in 2012 was £6500, calculate the average price per car in 2013.
- (b) If the number of cars exported in 2013 was 26244, then how many were exported in 2012?
- (c) Calculate the percentage change in the total value of cars exported from the UK to France.
- (d) In the same period the value of the pound compared to the Euro increased by 10% (i.e. you got 10% more Euros in 2013 for your pound than you did in 2012). Calculate the total value of car sales in 2013 in Euros if the exchange rate in 2012 was £1 = 1.2 Euros.

8. **Answer all parts of this question on the sheet containing figure 2.**

The cost (£ C) of flying a cargo plane on a certain route depends on the mass (m tonnes) of cargo carried, according to the formula

$$C = 1000 + \frac{600m^2}{1 + m}$$

- (a) Complete the table on figure 2 and hence draw a graph of C against m on the axes provided.
- (b) The airline has a budget of £4000 per plane. What is the maximum amount of cargo, in kilograms; the airline can carry on a plane?
- (c) The airline charges its customers £800 per tonne for cargo. By drawing a suitable straight line graph on figure 2, find the minimum mass of cargo (in tonnes) which must be carried on a flight to allow the airline to make a profit.
9. Solve the following equations
- (a) $\frac{1}{4}(x - 1) - \frac{1}{3}(x + 2) + 1\frac{1}{2} = 0$
- (b) $\frac{2}{x-1} = \frac{3}{4x-7}$
- (c) $\frac{10}{x} + \frac{12}{y} = 2$ and $\frac{15}{x} + \frac{3}{y} = -2$
- (d) $x^3 + 2y^2 = 35$ and $2x^3 - 5y^2 = 34$

Figure 1

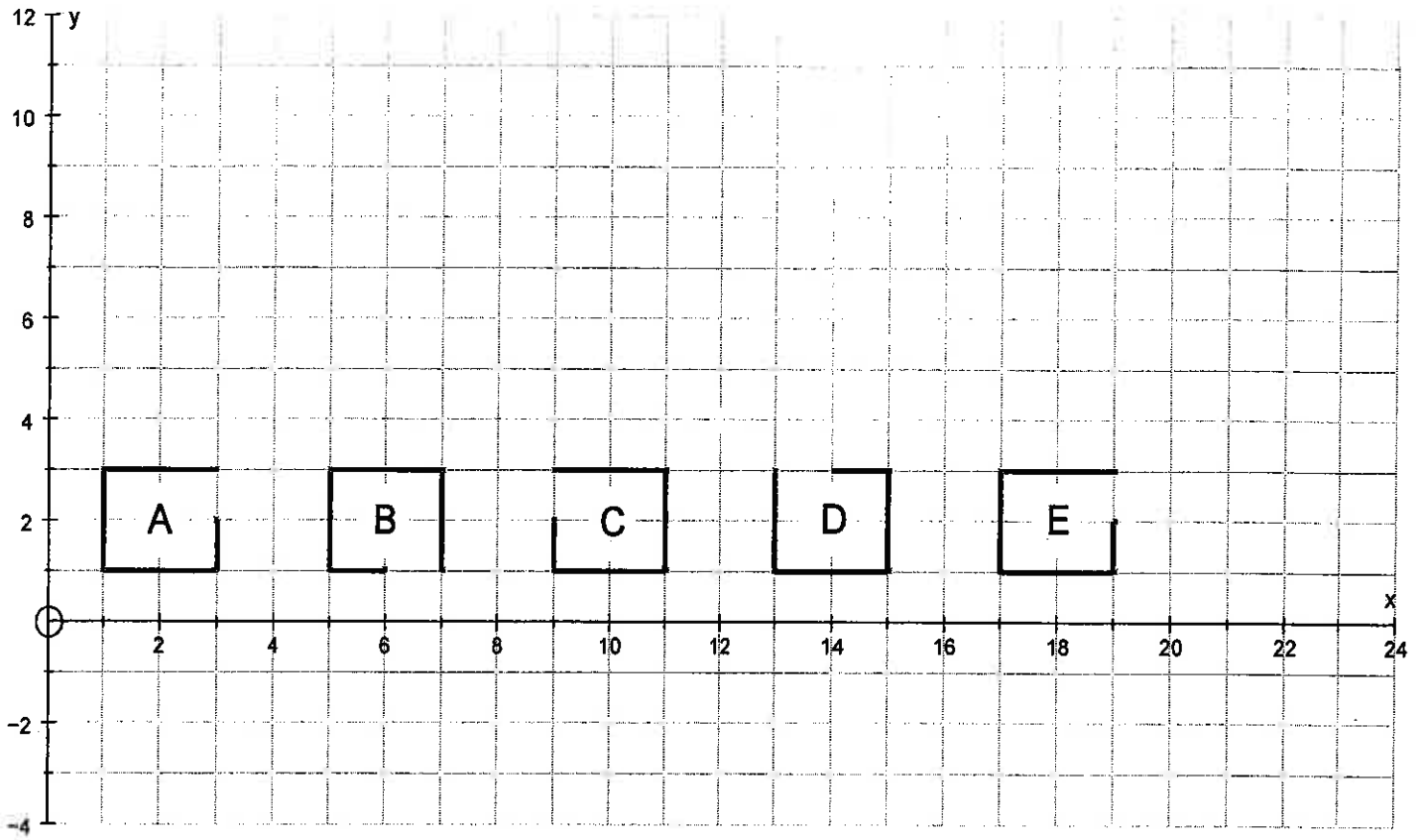
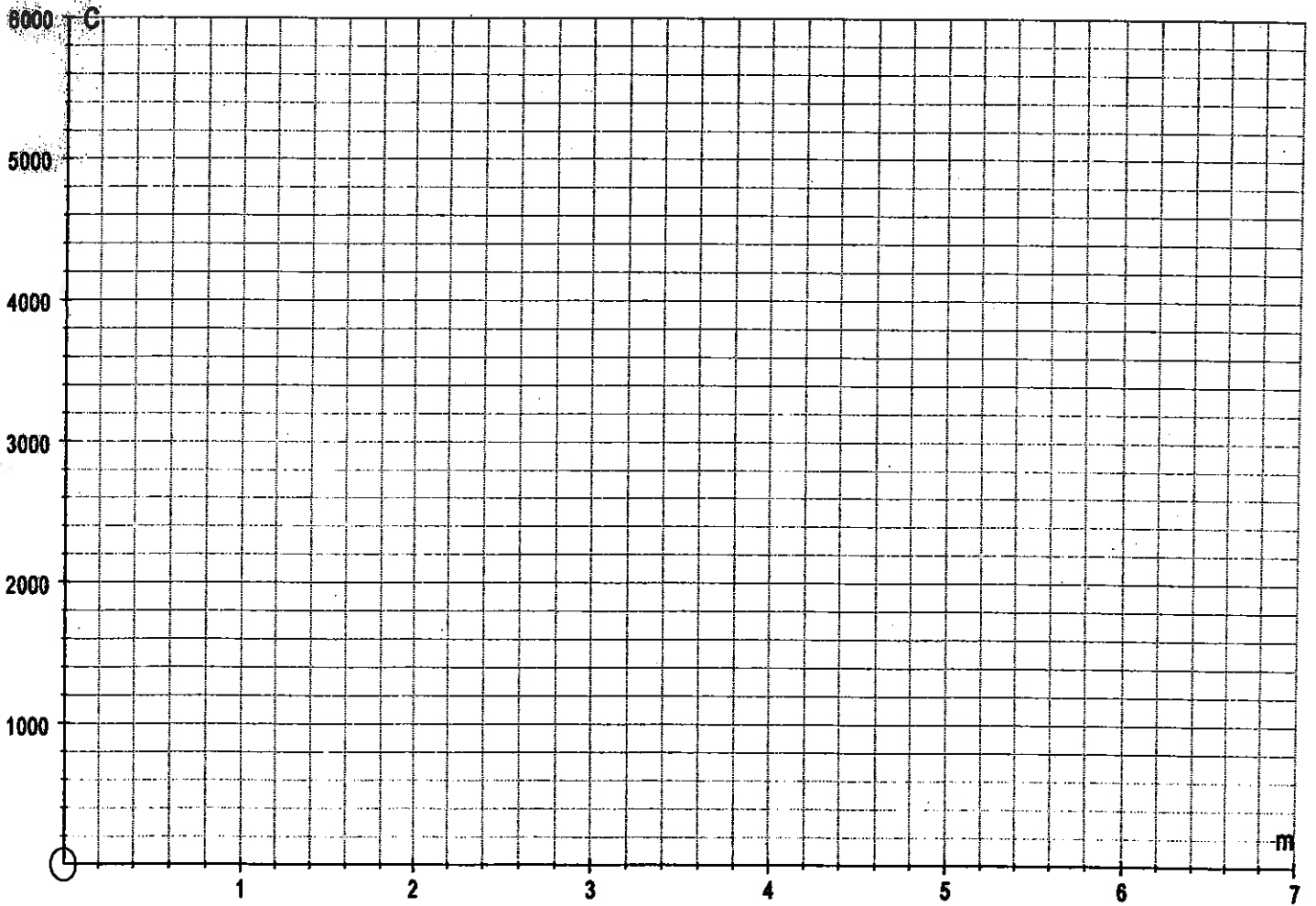


Figure 2

m	0	1	2	3	4	5	6
$600m^2$							
$1 + m$							
$\frac{600m^2}{1 + m}$							
$C = 1000 + \frac{600m^2}{1 + m}$							





HARROW
SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Thursday 27 February 2014
9.00am to 10.30am*

MATHEMATICS II

GENERAL INSTRUCTIONS:

You may attempt all questions if you have time, but greater credit will be given for complete solutions.

Show all your working.

Calculators may NOT be used.

PLEASE NOTE: This paper is not just about getting the right answers. You will be marked on the presentation of your solutions, the explanation of your working and the justification of your final answers.

1. The operation $*$ is defined on the set $S = \{0, 1, 2\}$ by the formula

$$x * y = x + y - xy$$

For example, $1 * 2 = 1 + 2 - (1 \times 2) = 1$

- (a) Copy and complete the table

$*$	0	1	2
0			
1			1
2			

- (b) Calculate (i) $1 * (1 * 2)$ (ii) $(1 * 1) * 2$

What do these answers tell you about this operation?

- (c) Solve (i) $x * 1 = 1$ (ii) $x * x = 0$

- (d) Now make a table for the same operation but with the set $S = \{0, -1, -2\}$

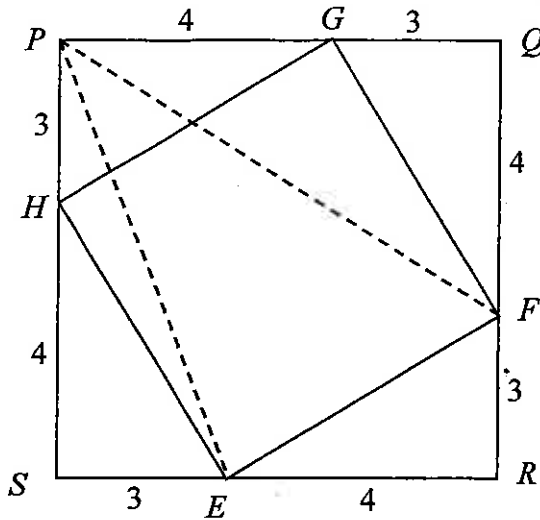
What is a difference with the results for this set, compared to the first?

- (f) Calculate $(-1 * 2) * -2$

2. (a) A knock-out singles tennis tournament starts with 16 players, who are divided into pairs who play each other for a place in the second round where there will be 8 players, and so on until the champion is the winner of the final. How many rounds will this tournament have and how many matches must be played?
- (b) In the singles at Wimbledon 128 players start in the first round. How many rounds are there and how many matches played in total?
- (c) If a tournament has n rounds then how many players entered the tournament in round one and how many matches are played.
3. Find the digits that A , B and C must stand for in order to make the addition sum correct.

$$\begin{array}{r}
 ABC \\
 +ABC \\
 +ABC \\
 \hline
 BBB
 \end{array}$$

4.



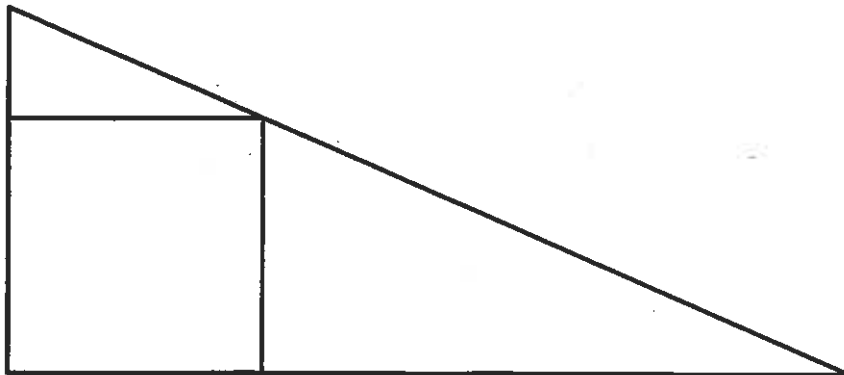
In the figure shown to the left $PQRS$ is a square.

- (a) Explain clearly why $EFGH$ is also a square.
- (b) Find the perimeter of $EFGH$.
- (c) Find the area of the triangle EPF .

5. A sequence of points in a plane have coordinates (x, y) . The coordinates are determined by the rule that any point with coordinates (x, y) is followed by the point with coordinates $(x + 2y, 2x - y)$.

- (a) If the first point is $(3, 2)$ then find the next five points in the sequence.
- (b) If the first point is (a, b) then find the fifth point in the sequence.
- (c) If the first point is (a, b) then state the ninth point.

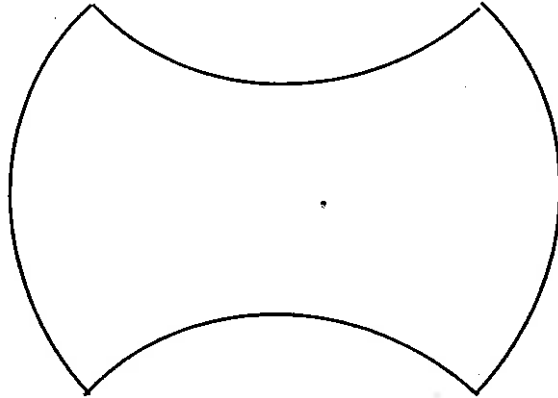
6. A square is inscribed in a 3,4,5 triangle as shown. What fraction of the triangle does it occupy?



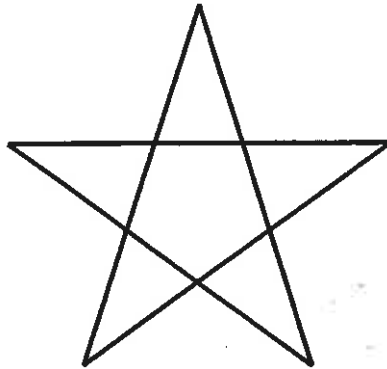
7. A bath has separate hot and cold taps. If the cold tap is turned on by itself then it takes 10 minutes to completely fill the bath, whereas with just the hot tap turned on it takes 12 minutes. A completely full bath takes $7\frac{1}{2}$ minutes to empty when the plug is removed. How long would it take to fill the bath if both taps were turned on and the plug was left out?

PLEASE TURN OVER

8. A circle of radius 1 cm is cut into four equal arcs which are arranged to make the shape shown. Calculate the area of the shape.



9. A five pointed star is as shown. Notice that it can be drawn continuously, without having to take your pencil from the paper.



Given that the star is symmetrical then find the angle inside each of the points.

Now draw a seven pointed star in the same way. (It does not have to be perfect but you may find it helpful to start by drawing a circle.) Find, by calculation, the angle inside each of the points of this assuming that it is symmetrical; give your answer as a fraction.

There are actually two possible seven pointed stars. Try to draw the other one and find the angle, inside each of the points of this.

Using your results so far try to predict what the angle will be inside the points of the most spiky nine pointed star that can be drawn.

How many different nine pointed stars can be drawn?



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

Wednesday 26 February 2014
4.15pm to 5.45pm

PHILOSOPHY AND APPLIED ETHICS

GENERAL INSTRUCTIONS:

This paper is designed to explore your ability to read and respond intelligently to material that you have not seen before.

We will aim to reward candidates who can construct a concise and well structured argument, that includes relevant information to support your line of reasoning.

- *You should aim to spend approx. 30 minutes reading and annotating the text.*
- *Do give evidence that you have planned your answer carefully. This may be in the form of notes or bullet points.*
- *You should aim to write between one and a half to two sides and the word limit is 1,000 words.*
- *Your rough work will be collected in with your final answer so that we can see some evidence of how you have approached and planned this piece of work.*

Assisted dying: the harm in helping

Making assisted dying legal would alter the way society weighs the value of human life forever

This week I was forced to face the truth that my much-loved and aged family dog was unnecessarily suffering as a result of a painful illness. I asked the vet to call at home – I thought it was right to end my dog's life, and wanted her to die in familiar surroundings. I reasoned that as a responsible pet owner, it could not be fair to let her go on as she was; moribund and miserable.

It is often said, on seeing someone suffer a long and painful illness, that we would not let an animal suffer in this way. But as terrible as human suffering can be, there is of course no meaningful comparison to be drawn between the morality of ending the lives of animals and people except perhaps for this: how relatively easy it is for us to convince ourselves that we are doing the right thing. That matters in the debate about assisted suicide as well as euthanasia.

In my time as a doctor, I cared for many people who were dying. It was not uncommon, during a degenerative illness or cancer, for someone to ask me to help them to end their lives. Depression and hopelessness are a normal part of coming to terms with dying or a debilitating illness. During that time most people would have been able to weigh up their choices and have the capacity to decide whether they wanted to end their lives. But I also witnessed most of those same people come through the depression to reach a kind of peace before they died. Had it been easy and painless to take their own lives, how many would have been denied the chance to come through a sometimes lengthy adjustment?

It isn't just the religious lobby that is opposed to a change in the law to allow assisted suicide. I have no faith banner to raise, and as a former doctor I know there are conditions for which I might at some point wish to end my life. Despite this, I don't believe I should have a right to make a doctor complicit in that decision.

People with capacity should have a right to make decisions for themselves – even if we don't agree with them, except where those decisions harm others. Assisted suicide *does* harm others: it harms the doctors who take on the responsibility for killing their patients. There is a vast difference between the moral responsibility in doctors withholding treatment that will end life and actively prescribing with the primary intent to ensure death. Failed attempts and the methods used may be distressing, but that does not justify the right to a clinically delivered death, which would fundamentally change the relationship between doctors and their patients and threaten to change the way society weighs the value of human life.

My uncle was able to have a dignified death – as he lived in Switzerland In Britain, we need to reframe the debate about assisted dying. People should have a choice about how they die

I've studied ethics as a branch of philosophy – it's fun. The theory, that is. But it is also vacuous. Worthwhile ethics can only be done with real people in front of you. You only know you've got it right when you would be happy to apply your theory to those you love.

Notionally, I was convinced that a loving and compassionate God would not demand of a person extreme and prolonged suffering in order to authenticate his ultimate control. God invites us to collaborate in the adventure of living, and we are free to make life-or-death choices in many ways. Some choose to smoke or drink. Even to drive or cross the road presupposes a degree of autonomy over our mortality. It has always seemed to me perverse to deny that autonomy at the very point when we need it most.

These thoughts were abstract until last year. My uncle was a well-known psychotherapist, specialising in anger management for teenagers, and had a private practice in Zurich. A millionaire, he lived a simple life with an almost Buddhist outlook. His values and his spirituality were admirable. He did not have a Protestant God's opinion as a reference point, but he had great care for human relationships and held life very precious.

After a terminal diagnosis he decided not to have treatment and he and his family made all the legal and medical arrangements to enable him to choose the moment of his death. The next three years were lived to the full and he was only bedridden for two weeks. During those three years the whole family found great comfort in the fact that he did not dread pain and disability getting out of control at the end. He travelled to England to see his sister, my mother, and they said goodbye. Together the family eventually made the decision that the time had come, they gathered around him with good wine, great music – a fine and dignified death. I spoke to his widow at my own mother's funeral a few months later and she is so grateful that because they lived in Switzerland they had the freedom to make the choices they did. I've had a little time to digest this. My uncle would have been dead by now either way. His choice feels life-affirming, dignified and measured. Also, very importantly, it was loving towards his family.

We need to reframe this debate. The question is not around the choice to live or die. That bit is sorted. The choice is about the manner of our death. I sit with bereaved families every week. Mostly they speak of care and kindness, of effective pain relief and a gentle slipping away. But it's not that rare to hear about difficult final days that have a nightmarish quality about them. It might be disturbingly vivid, but people do say to me "you would never let your dog suffer like that". I cannot believe in a God who demands that of us.

Maybe we have confused the right to live one's life to the very end with a moral obligation to do so.

The Catholic theologian Hans Küng gets it right in his aid-in-dying propositions. The patient will call it "surrender of life"; when the time of dying has come and the patient has been prepared for it, he may encounter it in submission, thankfulness and hopeful expectation. He will return his life into the hand of his creator, who is a God of mercy and not a cruel tyrant who would strive to see man in the hell of pain and helplessness as long as possible.

Recent research has shown that more than 70% of people in this country would welcome a change in the law, but there are genuine fears that it could prove impossible to get the safeguards right. Doctors feel insecure, even though of course they have been easing patients' death for centuries. There is also the fear that vulnerable elderly folk will feel pressure not to be a burden on their families.

The Swiss experience shows that these fears are unfounded. Since the 1940s it has been legal, within very tightly controlled rules, to help someone who wishes to die. It has not become normalised, far less expected. The numbers are low, and many more people explore the possibility and use it as an emotional safeguard, than choose to end their lives in that way.

The advent of the hospice movement was the sign of a more compassionate and humane society. Well-constructed legislation which gave those few who felt the need, the opportunity to make a choice about the manner and time of their death would be another such sign.

(i) Can euthanasia ever be justified?



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Wednesday 26 February 2014
10.00am to 10.30am*

PHYSICS

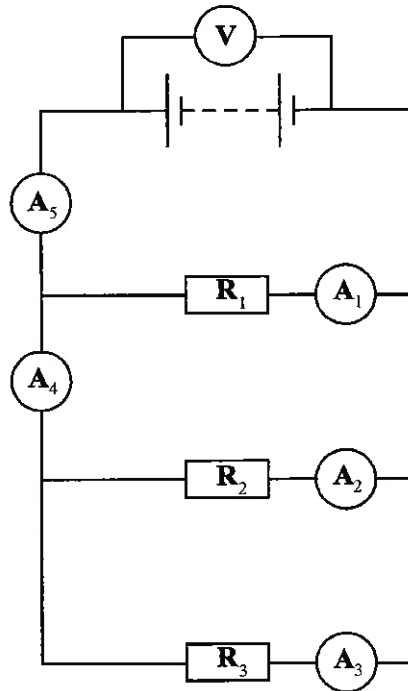
GENERAL INSTRUCTIONS:

*Answer **all**. questions in the spaces provided. All Working must be shown*

You may use a calculator if you wish

*13+ Scholarship Exam 2014
Physics*

1. A circuit was set up as shown in the diagram.



The table gives the current through three of the ammeters.

- a. Complete the table to show the current through the other two ammeters.

Ammeter	Reading on ammeter in amps
A₁	0.1
A₂	0.4
A₃	0.2
A₄	
A₅	

(2)

Question continues....

13+ Scholarship Exam 2014
Physics

- b. How do you explain that the currents flowing through R_1 and R_2 are different.

(2)

- c. The lead connecting R_3 to the ammeter A_3 develops a fault and no longer conducts electric current.

Fill in the table below to show what the ammeters would now read:

Ammeter	Reading on Ammeter in Amps
A_1	
A_2	
A_3	
A_4	
A_5	

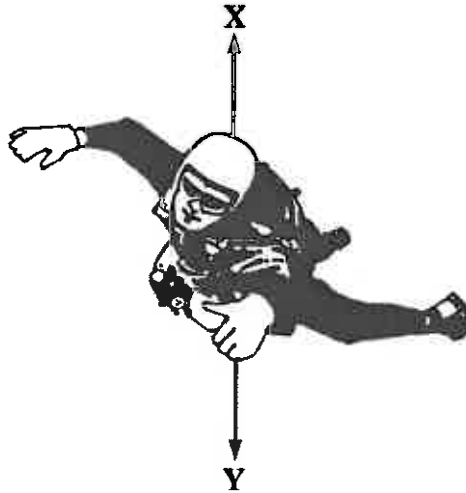
(5)

(Total 9 marks)

13+ Scholarship Exam 2014
Physics

2. A sky-diver jumps from a plane.

The sky-diver is shown in the diagram below.



(a) Arrows **X** and **Y** show two forces acting on the sky-diver as he falls.

(i) Name the forces **X** and **Y**.

X

Y

(2)

(ii) Explain why force **X** acts in an upward direction.

.....
.....

(1)

(iii) When the sky-diver first steps out of the plane, forces **X** and **Y** are unbalanced.

Which of the forces will be bigger?

(1)

(iv) How does this unbalanced force affect the sky-diver's motion?

.....
.....

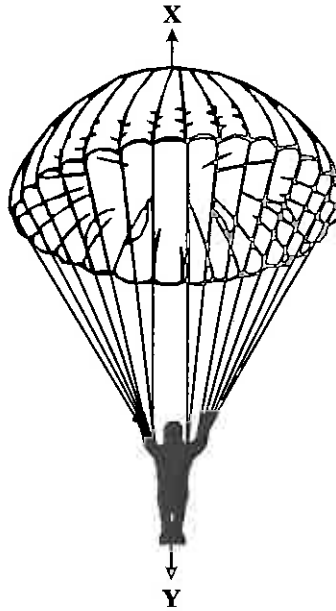
(2)

Question continues....

13+ Scholarship Exam 2014
Physics

- (b) After some time the sky-diver pulls the rip cord and the parachute opens.

The sky-diver and parachute are shown in the diagram below.



- (i) Immediately after the parachute has fully opened, what can be said about the forces X and Y acting:

Force **X** has:

increased / stayed the same / decreased.

Force **Y** has

increased / stayed the same / decreased.

(2)

Question continues....

13+ Scholarship Exam 2014
Physics

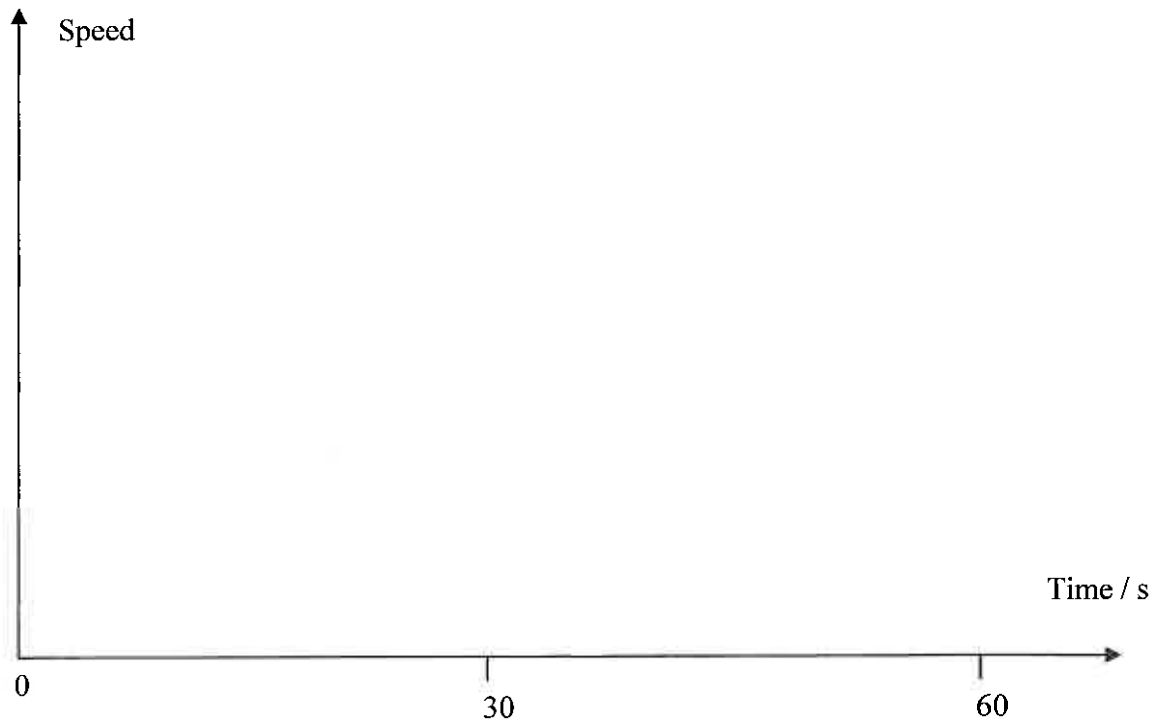
- (ii) Describe the sky-diver's motion over the first second or two after the parachute has opened

(2)

- (c) In the actual jump, the sky-diver opens the parachute after 30 s of 'free-fall', and is in the air for a total of 60 s.

Using the axes below, sketch a speed against time graph for the sky-diver from the moment he steps out of the plane (at time = 0 s) to the moment he lands safely on the ground.

You do not have to mark any values of speed on the graph – you just need to sketch the general shape of the graph over the course of his journey from plane to ground.

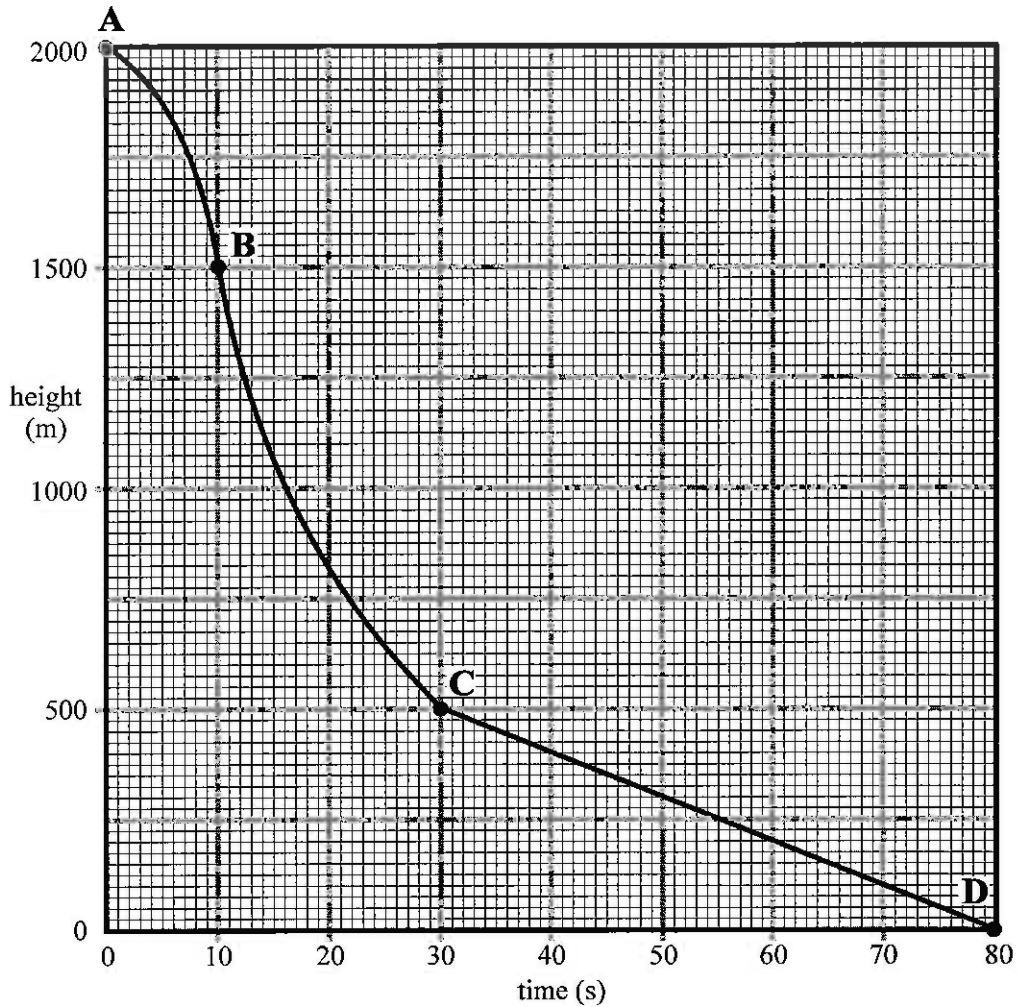


(5)

Question continues....

13+ Scholarship Exam 2014
Physics

(c) The graph below shows how the height of another sky-diver changes with time.



(i) Which part of the graph, **AB**, **BC** or **CD** shows the sky-diver falling at a constant speed?

..... (1)

(ii) What distance does the sky-diver fall at a constant speed?

Distance m (1)

(iii) How long does he fall at this speed?

Time s (1)

Question continues....

13+ Scholarship Exam 2014
Physics

(iv) Calculate this speed.

.....
.....
.....

Speed m/s

(2)

(Total 20 marks)

3. Use the laws of physics and your wider knowledge to explain the following:

a. A boy finds it easier to walk in soft snow when he attaches two wide pieces of stiff card to the soles of his shoes.

.....
.....
.....
.....

(3)

b. The brake pads of a Formula 1 car get very hot when cars brake into a tight corner.

.....
.....
.....
.....

(3)

c. A boy notices he has to pull harder to open his fridge door when the fridge has been set to a lower temperature.

.....
.....
.....
.....

(3)

(Total 9 marks)



HARROW
SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

*Thursday 27 February 2014
11.00am to 12.00noon*

SPANISH

GENERAL INSTRUCTIONS:

*You should start a new sheet of paper for each exercise.
Please do all of your work ON ALTERNATE LINES.*

*The marks are shown at the end of each exercise. Use your time
accordingly.*

GENERAL INSTRUCTIONS:

You should start a new sheet of paper for each exercise.

Please do all of your work ON ALTERNATE LINES.

The marks are shown at the end of each exercise. Use your time accordingly.

1. Translate into English. You should write ON ALTERNATE LINES.

Felipe vive con su familia en el sur de España desde hace tres años. Cuando era muy pequeño, vivían en Argentina, pero Felipe no se acuerda muy bien de ese período porque tuvieron que mudarse de casa – su padre consiguió un trabajo nuevo en Málaga. Ahora Felipe tiene diez años y va a cumplir sus once años dentro de dos semanas. Le encanta su vida en Andalucía – vive en una casa moderna con un jardín enorme, donde suele pasar los fines de semana jugando al béisbol con sus varios amigos.

Felipe es un buen alumno. Asiste cada día a su colegio, que está en el centro de Málaga a unos quinientos metros de la Plaza Mayor, y estudia mucho. Su asignatura favorita es el inglés porque el profesor es muy gracioso e inteligente, pero le gustan también las matemáticas porque se le dan bien.

Felipe tiene mucha suerte – como ha sacado buenas notas en el colegio este año, su padre acaba de decirle que ha comprado billetes de avión para toda la familia y que van todos a ir de vacaciones a los Estados Unidos. Felipe está muy entusiasmado porque hace mucho tiempo que quiere visitar Disneylandia.

(30 marks)

Please turn over

NOW START ANOTHER SHEET OF PAPER

2. Translate these sentences into Spanish ON ALTERNATE LINES:

1. We like coffee.
2. Roberto likes playing tennis.
3. My best friend is tall and slim.
4. We have been in Madrid for two days.
5. Maria is sixteen years old. [*N.B. write out the number in full*]
6. Two years ago, Juan went to Barcelona.
7. Are you (tú) going to eat some chocolate?
8. I usually go to bed at around 10.30 at night.
9. Norberto is the most intelligent boy in the class.
10. His book is less interesting than this newspaper.

(30 marks)

Please turn over

NOW START ANOTHER NEW SHEET OF PAPER.

ON ALTERNATE LINES

You recently went to the cinema with some friends to see a film. Describe the outing, being sure to include details about the following points:

- Who was there
- What the film was about and whether you liked it
- How you travelled to the cinema
- Your impression of the trip overall
- Where you are planning to go with your friends for your next outing

The account may be true or imaginary.

No credit will be given for material taken from other parts of this examination paper, or irrelevant material.

You should write using any tenses you consider appropriate. When you have finished, you should **CHECK YOUR WORK CAREFULLY**, looking especially at verb forms, genders, adjectives and spelling.

Write about 130 words in Spanish **ON ALTERNATE LINES**. Do not write more than 150 words. Concentrate on **quality**, not quantity.

Put two oblique lines thus // after 130 words.

(40 marks)