



HARROW
SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2015

Analytical Reasoning

1 Hour

GENERAL INSTRUCTIONS:

*Please do not open this booklet until you are told to do so.
Please make no marks in this booklet.*

PRACTICE TEST

1. Multiply the last figure by the sum of the first two figures:

6, 5, 5

A. 55 B. 60 C. 125 D. 150

2. These words form a sequence which has been mixed up. Rearrange them into the proper sequence. Mark the letter for the **middle** word on your answer sheet.

A. good B. worst C. fair D. best E. bad

3. Find a word in the second group which is the **opposite** of a word in the first group. Mark **two** letters on your answer sheet.

(A. slow B. smooth C. water) (X. current Y. fast Z. river)

4. Complete this sentence by choosing one word. Mark the letter for the word on your answer sheet.

Cat is to kitten as hen is to

A. egg B. feather C. chick D. cock

5. Each of three boys, Alan, Paul and Jeff has a different pet.

Paul is older than Alan.

The rabbit belongs to the oldest.

The youngest has a cat.

Jeff is older than Paul.

Who owns a cat?

A. Alan B. Paul C. Jeff

6. Find two words, one from each group, which go together to make one longer word. Mark **two** letters on your answer sheet.

(A. part B. post C. pat) (X. man Y. mind Z. may)

7. One word in the five below is different from the rest. Find that word and mark the letter for it on your answer sheet.

A. newspaper B. radio C. magazine D. book E. leaflet

8. Find the next letter or number in the series and mark the right letter for it on your answer sheet.

ace, fhj, kmo, prt, (?)

A. tuv B. rst C. urs D. uwy

9. If $A = 2$, $B = 5$, $C = 9$, $D = 15$, $E = 20$

$A + A + B = (?)$

Mark the right letter on your answer sheet.

10. Find **one** letter which will go in **both** brackets to complete all the words. Mark its letter on your answer sheet.

bu (?) top ye (?) hut

A. d B. l C. n D. s E. t

11. The second word in each set of brackets has been made from the first word using the same rule. Which word should go in the last brackets? Mark its letter on your answer sheet.

(repeal, real) (vencer, veer) (rebate, ?)

A. rate B. beat C. tear D. bare

12. Find a word to go in the second brackets which is made by using the same rule as the word in the first brackets. Mark its letter on your answer sheet.

hero (home) mule solo (?) laid

A. soil B. sold C. said D. dial

REASONING 1A

Find the letter for the **one** word which best completes the sentence. Mark its letter on your answer sheet.

Example: Good is to better as bad is to

- A. worse B. best C. awful D. naughty

Answer: worse

On your answer sheet you would put ABCD

1. Train is to rails as car is to

- A. garage B. road C. petrol D. sign

2. Goldfish is to bowl as budgerigar is to

- A. den B. green C. song D. cage

3. Butter is to milk as wine is to

- A. grape B. glass C. red D. liquid

4. Chiropodist is to feet as optician is to

- A. glasses B. lens C. focus D. eyes

5. Racquet is to tennis as bat is to

- A. ball B. game C. cricket D. match

In each question below find two words, one from each group. Put them together to make a new, longer word without changing the order of the letters. The word from the first group always comes first. On your answer sheet mark two letters one from each group.

Example: (A. out B. open C. by) (X. bite Y. like Z. side)

Answer: out side

On your answer sheet you would put

A	B	C	X	Y	Z
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6. (A. chest B. body C. head) (X. heard Y. nut Z. squirrel)

7. (A. sun B. star C. planet) (X. bright Y. dawn Z. rise)

8. (A. sea B. wet C. water) (X. drop Y. fall Z. fill)

9. (A. card B. pack C. paper) (X. wrap Y. board Z. ticket)

10. (A. line B. rod C. net) (X. work Y. chip Z. wood)

11. (A. to B. in C. on) (X. bent Y. warp Z. crease)

12. (A. find B. know C. see) (X. ledge Y. shelf Z. rack)

Follow the instructions to work out the answer. Mark the right letter on your answer sheet.

Example: Add the largest two figures together and divide the total by the smallest figure:

3, 2, 5

A. 1 B. 4 C. 6 D. 7

Answer: 4

On your answer sheet you would put A B C D

13. Multiply the first and third figures and add on the second figure:

2, 6, 1

A. 6 B. 7 C. 8 D. 13

14. Subtract the smallest figure from the largest and add on the last figure:

3, 6, 9, 8

A. 14 B. 17 C. 20 D. 21

15. Add the second and third figures and divide the total by the first figure:

3, 7, 14

A. 3 B. 5 C. 6 D. 7

16. Add all the numbers and divide the answer by itself:

7, 11, 18

A. 1 B. 9 C. 22 D. 36

a b c d e f g h i j k l m n o p q r s t u v w x y z

In each question below there is a series of numbers or letters. On each line find the next one in the series and mark the right letter for it on your answer sheet.

Example: ab, cd, ef, gh, (?)

A. il B. is C. ij D. jk

Answer: ij

On your answer sheet you would put A B C D

17. ae, ea, io, oi, ou, (?)

A. ci B. uo C. ua D. iu

18. 1, 2, 4, 7, 11, 16, (?)

A. 18 B. 19 C. 22 D. 23

19. f, i, l, o, (?)

A. m B. n C. p D. r

20. 56, 65, 57, 75, 58, 85, (?)

A. 59 B. 76 C. 86 D. 95

21. abd, efh, ijl, mnp, (?)

A. stv B. qrt C. onq D. pqr

22. a, z, b, x, c, v, d, t, e, (?)

A. q B. p C. n D. r

23. 23, $19\frac{1}{2}$, 16, $12\frac{1}{2}$, 9, (?)

A. $3\frac{1}{2}$ B. $4\frac{1}{2}$ C. $5\frac{1}{2}$ D. $6\frac{1}{2}$

In each line below, find two words, one from each group which are most nearly opposite in meaning. On your answer sheet mark two letters, one from each group.

Example: (A. high B. rich C. light) (X. poor Y. quiet Z. money)

Answer: rich, poor

On your answer sheet you would put

<input type="checkbox"/> A	<input checked="" type="checkbox"/> B	<input type="checkbox"/> C	<input checked="" type="checkbox"/> X	<input type="checkbox"/> Y	<input type="checkbox"/> Z
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24. (A. exact B. accurate C. true) (X. artificial Y. false Z. night)

25. (A. build B. decide C. refuse) (X. destroy Y. make Z. hurt)

26. (A. give B. gift C. parcel) (X. present Y. wrap Z. take)

27. (A. moon B. shine C. dark) (X. night Y. light Z. right)

28. (A. vacant B. public C. personal) (X. private Y. include Z. clown)

29. (A. slow B. youthful C. active) (X. young Y. elderly Z. careful)

In the rows of words below, find what some of the words have in common. Find the word which is **different** from the rest. Then, mark its letter on your answer sheet.

Example: A. black B. mouse C. red D. green E. grey

Answer: mouse

On your answer sheet you would put A>B>C>D>E>

30. A. road B. lane C. street D. alley E. canal
31. A. noon B. afternoon C. tea D. morning E. evening
32. A. strange B. doubtful C. odd D. weird E. peculiar
33. A. adult B. docker C. teacher D. secretary E. plumber
34. A. coat B. scarf C. jacket D. mackintosh E. anorak
35. A. inside B. within C. between D. around E. amidst

Here are some puzzles. When you have worked out the answers, mark the right letters on your answer sheet.

Mr. Clark, Mr. Watson and Mr. Jackson are three men.

Mr. Clark and Mr. Watson are married.

Mr. Watson and Mr. Jackson are fat.

Mr. Clark and Mr. Jackson are short.

36. Who is short and fat?

- A. Mr. Clark B. Mr. Watson C. Mr. Jackson

37. Who is the short married man?

- A. Mr. Clark B. Mr. Watson C. Mr. Jackson

Maruk, goffre and caypu are imaginary creatures.

Only maruk and goffre can fly.

Only goffre and caypu have four legs.

Only maruk and goffre are brown.

38. Which creature has four legs and can fly?

- A. maruk B. goffre C. caypu

39. Which brown creature has four legs?

- A. maruk B. goffre C. caypu

In each question below letters stand for numbers. Work out the answer to the sum, then find its letter and mark it on your answer sheet.

Example: If $A = 1$, $B = 2$, $C = 3$, $D = 6$, $E = 8$

$$C + D - A = (?)$$

Answer: E

On your answer sheet you would put

A	B	C	D	E
---	---	---	---	---

If $A = 2$, $B = 4$, $C = 5$, $D = 10$, $E = 20$

40. $(E \div A) - C = (?)$

41. $(A \times C) + D = (?)$

If $A = 1$, $B = 2$, $C = 10$, $D = 6$, $E = 8$

42. $E - D = B \times (?)$

43. $D + C = E \times (?)$

If $A = 1$, $B = 1.5$, $C = 2$, $D = 3$, $E = 0$

44. $B + B - A = (?)$

45. $A \times C = (?)$

If $A = 1$, $B = 4$, $C = 5$, $D = 7$, $E = 9$

46. $(C \times D) + A = E \times (?)$

Find the **one** letter which will go in **both** brackets to complete all the words. Mark its letter on your answer sheet.

Example: mea (?) able si (?) op

A. p B. n C. f D. t E. c

Answer: t

On your answer sheet you would put ABCDE

47. lac (?) ey tan (?) not

A. e B. t C. k D. g E. h

48. wan (?) end plai (?) ilt

A. d B. s C. t D. v E. w

49. lea (?) ail stif (?) old

A. f B. k C. j D. d E. r

50. mos (?) uck hur (?) rim

A. d B. l C. s D. t E. y

51. bu (?) all se (?) hat

A. c B. m C. f D. d E. t

52. los (?) and pas (?) pear

A. e B. l C. s D. t E. n

53. pla (?) et glor (?) ounge

A. d B. n C. m D. s E. y

54. cla (?) isp stra (?) eave

A. n B. p C. l D. y E. w

In each line below the words are in pairs. Find the word which completes the last pair in the same way as the other pairs in the line have been made. Mark its letter on your answer sheet.

Example: (sale, ale) (fall, all) (meat, ?)
A. ate B. tea C. met D. eat

Answer: eat

On your answer sheet you would put ABCD

55. (mate, tame) (late, tale) (care, ?)
A. case B. race C. lace D. mace

56. (product, pout) (wrangle, wage) (crackle, ?)
A. cake B. rack C. leer D. real

57. (droop, poor) (stool, loot) (brood, ?)
A. rod B. odd C. door D. rood

58. (manage, age) (tonsil, oil) (parent, ?)
A. ant B. net C. pat D. rat

59. (time, tip) (slime, slip) (grime, ?)
A. prime B. grip C. grim D. mire

60. (core, fore) (mare, pare) (date, ?)
A. gate B. fate C. late D. mate

61. (drip, rap) (drift, raft) (drink, ?)
A. rain B. drain C. rink D. rank

Rearrange the words below into the correct order of size or sequence. Then, find the **middle** word and mark its letter on your answer sheet.

Example: A. large B. medium C. tiny D. enormous E. small

Answer: medium

On your answer sheet you would put C A D B E

62. A. October B. April C. January D. December E. July

63. A. mansion B. shed C. cottage D. house E. palace

64. A. pea B. apple C. melon D. grapefruit E. grape

65. A. paragraph B. letter C. word D. chapter E. sentence

66. A. town B. street C. country D. house E. world

67. A. whisper B. mutter C. scream D. speak E. shout

68. A. rain B. mist C. drizzle D. downpour E. cloudburst

Look at the way the first word in brackets is made up out of the letters of the two words on either side of it. Find a word to go in the second brackets which is made up in the same way from letters in the words next to it. Mark its letter on your answer sheet.

Example: man (mat) tip ·bug (?) dew
 A. bud B. dug C. bed D. wed

Answer: bud

On your answer sheet you would put ABCD

69. goat (oats) lips ever (?) pony
 A. prey B. pore C. very D. veer

70. span (path) this spot (?) emit
 A. mist B. poem C. stop D. site

71. come (cost) stand find (?) react
 A. fire B. rate C. fine D. tire

72. lamp (also) swot pork (?) ally
 A. lark B. park C. play D. opal

73. mope (open) nail bide (?) able
 A. bald B. dale C. bled D. idea

74. once (cot) past idle (?) hump
 A. hid B. lid C. lip D. hip

75. fat (fear) her bar (?) lot
 A. boat B. blot C. barb D. bolt

REASONING 1 - ANSWER SHEET

Please mark the boxes like , not like .
Rub out mistakes thoroughly.

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END OF TEST

Do your rough work here



HARROW
SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2015

ANCIENT GREEK

1 Hour

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.



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2014

Thursday 26th February 11.00-12.00

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

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) Πολυφημος
 - (b) Λιωνελ Μησσι
 - (c) Περσεφονη
 - (d) Έρμης
 - (e) Λεωνιδας
- [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) phobia
 - (b) stasis
 - (c) Dēmētēr
 - (d) asthma
 - (e) cinema
 - (f) hydrogen
- [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) 12 - 7 - 19 - 7 - 17
 - (b) 18 - 19 - 17 - 1 - 19 - 7 - 3 - 15 - 18
 - (c) 22 - 1 - 11 - 5 - 16 - 15 - 18
 - (d) 10 - 17 - 20 - 16 - 19 - 24
- [8]
- 4 Translate into English:
- (a) ὁ υἱὸς πιστευει τῷ πατρει [4]
 - (b) δια τον πολεμον αἱ ἐν τη νησῶ ἐφευγον. [4]
 - (c) οὔτε γαρ ναυς οὔτε συμμαχους εἶχομεν. [4]
 - (d) πολλοι γαρ κινδυνοι ἡμιν ἐσονται [4]
 - (e) ἐγω σοφωτερος σου εἰμι. [3]
- [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 χωρων
 - (b) οἱ ἄνδρες

- (c) τοις ἀθλοῖς [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) ὁ ἡγεμῶν
- (b) τὴν εἰρήνην
- (c) ἡ βιβλος [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) pathos
- (b) ephemeral
- (c) hypodermic
- (d) rhetoric [4]
- 8 **Write out any TWO of the following:**
- (a) The strong aorist active of λαμβάνω.
- (b) ὁ φυλαξ 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:

Work out the title of the film from the sentence below:

Περσεΐδαξων καὶ οἱ Δωδεκάθεοι [2]

SECTION B (10 marks)

Translate into Greek:

- (a) The slave is chasing the horse [3]
- (b) We fell into the river [3]
- (c) The teacher throws away the books [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 at the foot of the 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.

Paris and Helen

The historian Herodotus gives an unorthodox account of what happened to Helen after being abducted by the Trojan prince Paris.

ἐπει ὁ Παρις¹ τὴν Ἑλενην² κλεψας πρὸς τὴν Τροίαν³ ἤγαγεν, οἱ Ἕλληνες ἐκείσε⁴ πολλὰς ναυσὶν ἐπλευσαν· ἐβούλοντο γὰρ τῷ Μενελαῷ⁵ βοηθεῖν.⁶

ἀφικόμενοι⁷ δὲ ἐξεβησαν εἰς γῆν καὶ στρατοπέδον ἐποίησαν. ἐπεὶτα δὲ οἱ στρατηγοὶ ἀγγελοῦς εἰς τὴν πόλιν ἐπέμψαν καὶ μετὰ τούτων τὸν Μενελάον αὐτόν. οὗτοι οὖν, ἐπει εἰσηλθὼν εἰς τὰ τεῖχη,⁸ ἤτησαν⁹ τὴν Ἑλενην καὶ τὰ χρήματα ἃ ὁ Παρις ἔλαβεν. οἱ δὲ Τρῶες τὸν αὐτόν λογον καὶ τότε καὶ ὕστερον¹⁰ εἶπον “οὔτε τὴν Ἑλενην οὔτε τὰ χρήματα ἔχομεν ἀλλὰ πάντα ταῦτα ἐν τῇ Αἴγυπτῳ¹¹ ἐστίν.”

¹ Παρις, ἴδος, ὁ: Paris

² Ἑλενη, ἡς: Helen

³ Τροία, ας: Troy

⁴ ἐκείσε: (to) there, to that place

⁵ Μενελαός, ου, ὁ: Menelaus

⁶ βοηθεῖν: to help (+ dat)

⁷ ἀφικνεομαι: to arrive

⁸ τεῖχος, ους, το: wall

⁹ αἰτέω: to ask for

¹⁰ ὕστερος, α, ον: later

¹¹ Αἴγυπτος, ου, ἡ: Egypt

οί δε Ἕλληνες οὐ πιστευοντες ἑννεα¹² ἔτη ἐπολιορκουν¹³ την Τροϊαν, τῷ δε δεκατῷ¹⁴ ἔλαβον. οἱ μεντοι Ἕλληνες οὐχ ἠύρον την Ἑλενην ἀλλα τον αὐτον λογον ἤκουσαν.

νυν οὖν πιστευσαντες ἀπεπεμψαν τον Μενελαον αὐτον προς την Αἴγυπτον. οὗτος δε ἀφικομενος ἀπελαβε την Ἑλενην οὐδεν κακον παθουσαν και τα ἑαυτου¹⁵ χρηματα παντα.

Questions on the passage :

- (a) How did the Greek get to Troy? [1]
- (b) What was the first thing the Greeks did after disembarking at Troy? [1]
- (c) Why might you have been inclined to believe the Trojans (look at lines 6-7)? [1]
- (d) How long were the Greeks at Troy for? [1]
- (e) What two things did Menelaus get back after he came to Egypt? [1]

Total: 100 marks

¹² ἑννεα: nine

¹³ πολιορκεω: to besiege

¹⁴ δεκατος, η, ον: tenth

¹⁵ ἑαυτου: of his, belonging to him



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BIOLOGY

30 Minutes

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 as shown in the example below:

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

- diabetes
- bronchitis
- cholera
- hepatitis

a) What is the largest fish in the ocean? **(1)**

- giant squid
- blue whale
- great white shark
- whale shark

b) Which branch of medicine is concerned with the study of cancer? **(1)**

- gynaecology
- endocrinology
- oncology
- neurology

c) Approximately what volume of blood is pumped out of the left side of the heart in one minute when a person is at rest? **(1)**

- 5 litres
- 50 litres
- 500 litres
- 5000 litres

d) Which of the following substances is used to test for the presence of starch? **(1)**

- Benedict's reagent
- Biuret's reagent
- lime water
- iodine solution

e) Which is the correct sequence of organs through which food passes along a human's digestive system? (1)

- i. stomach → large intestine → oesophagus → small intestine
- ii. oesophagus → stomach → small intestine → large intestine
- iii. stomach → small intestine → large intestine → oesophagus
- iv. oesophagus → small intestine → stomach → large intestine

f) Which of the following human characteristics shows discontinuous variation? (1)

- i. eye colour
- ii. body mass
- iii. hand span
- iv. hair length

g) Which of the following primates is not a great ape? (1)

- i. gorilla
- ii. chimpanzee
- iii. human
- iv. baboon

h) How should the scientific name for humans be written? (1)

- i. *homosapiens*
- ii. *Homo Sapiens*
- iii. *homo Sapiens*
- iv. *Homo sapiens*

i) Which food contains the most energy per gram? (1)

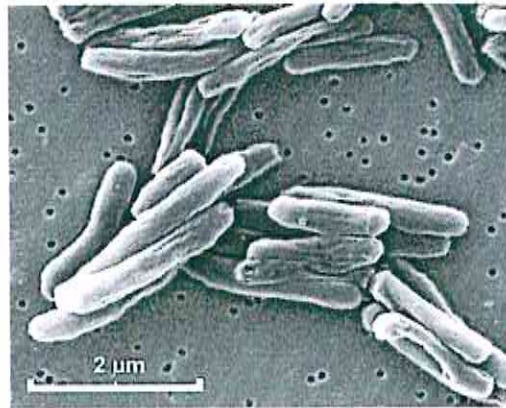
- i. chocolate biscuit
- ii. rice
- iii. fruit juice
- iv. butter

/ 9 marks

Question 2

Tuberculosis (or TB) is an infectious disease caused by a bacterium. The TB bacterium infects many different organs of the body but especially the lungs where it can damage the alveoli (air sacs). When an infected person coughs or sneezes tiny droplets of moisture are expelled that contain TB bacteria. If another person inhales these droplets they can become infected.

The image below is of some TB bacteria taken with a very powerful (electron) microscope. The length of the scale bar on the image is $2\ \mu\text{m}$ (micrometres).



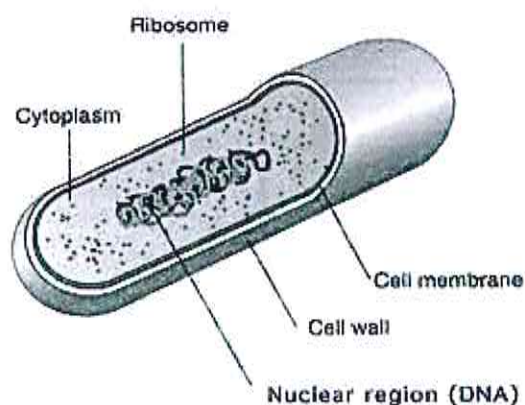
- a) Approximately how long (in mm) is one of the bacteria? (Note that $1\ \text{mm} = 1000\ \mu\text{m}$.)
Show your working. (2)

Answer =mm

- b) Calculate the magnification of the image. Show your working. (2)

Answer =

The diagram below shows the basic structure of a bacterial cell.



c) What is the function of a cell membrane? (1)

.....

d) State two differences between the structure of a bacterial cell and an animal cell. (2)

.....
.....

e) Explain in detail how damage to the alveoli in the lungs would affect the ability of a patient with TB to do exercise. (4)

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

The table below shows the incidence of TB in different countries around the world in 2013. Incidence is the number of new cases of TB that occur each year per 100 000 people in the population.

Country	Number of new cases of TB per 100 000 population
Algeria	81
Australia	6
Brazil	46
Nepal	156
UK	13
Zambia	410

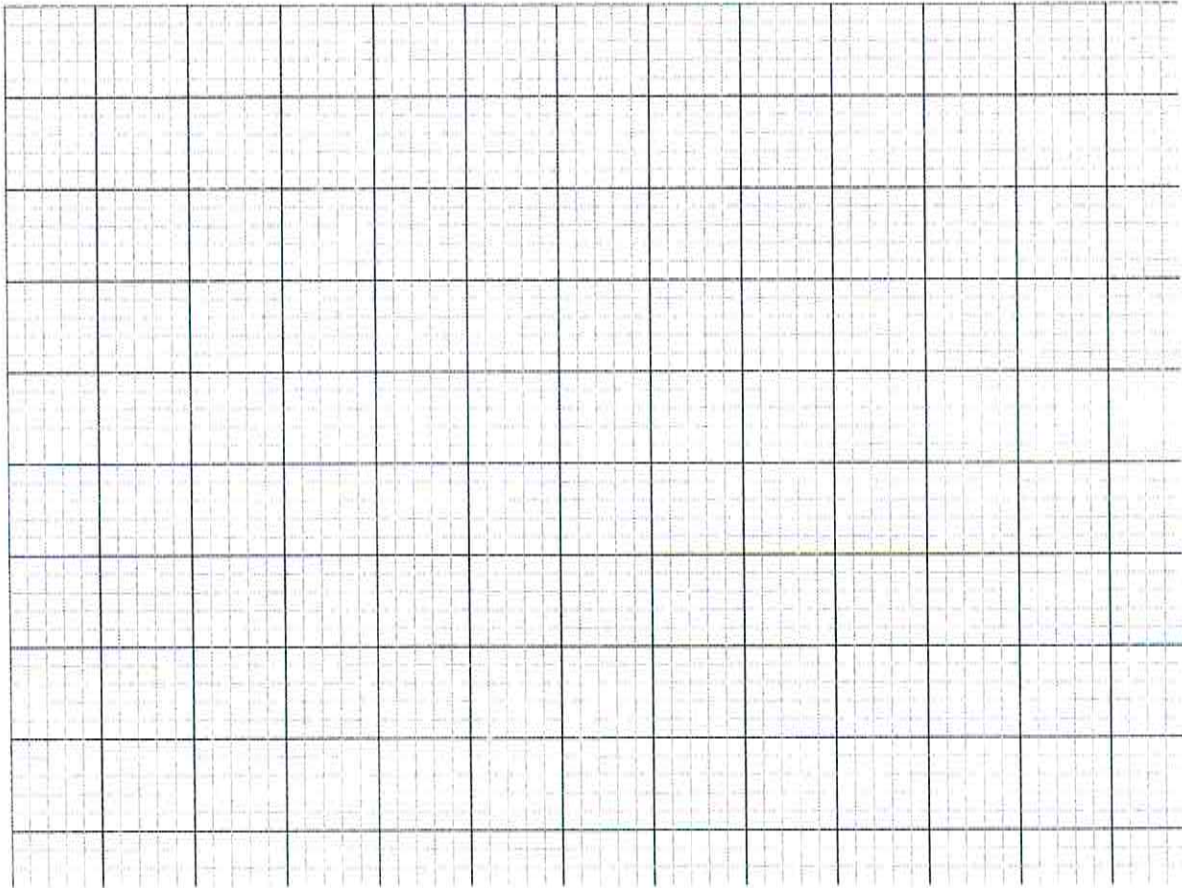
f) If the population of the UK was 64 million, what was the total number of new cases of TB in the UK in 2013? Show your working. (2)

Answer =

g) Suggest why the incidence is calculated per 100 000 of the population. (2)

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

h) Plot this data in a suitable graph or chart on the graph paper below. Make sure that the axes are fully labelled. (4)



i) Describe and explain two different measures that can be taken to control the spread of TB. (4)

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

/ 23 marks



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CHEMISTRY

30 Minutes

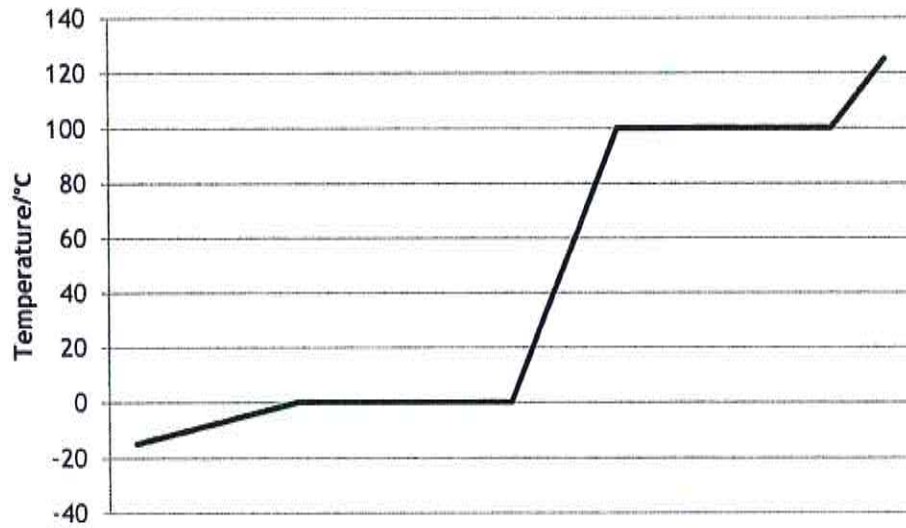
GENERAL INSTRUCTIONS:

Answer all questions in the spaces provided.

You will need a calculator.

1. This question is about solids, liquids and gases.

a. This graph shows how the temperature of water varies as it is heated:



What happens to water at:

i. 0°C

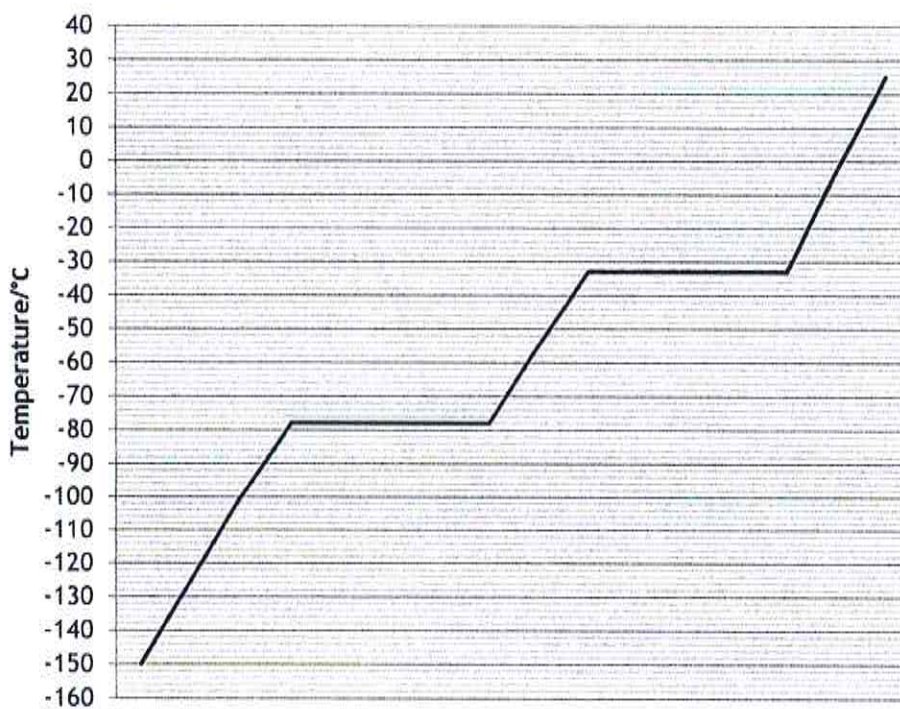
..... [1]

ii. 100°C

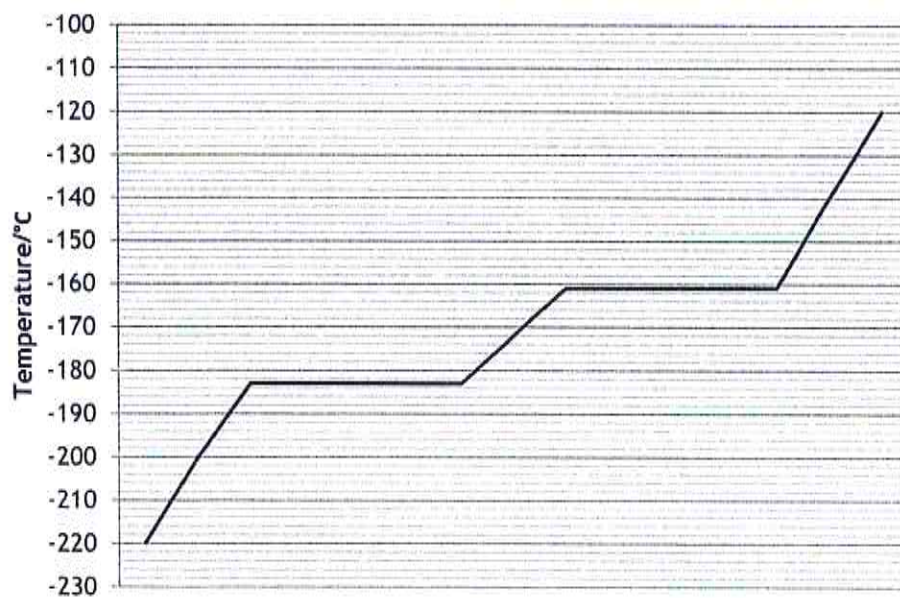
..... [1]

- b. The following graphs show how the temperatures of two other compounds vary as they are heated:

Ammonia:



Methane:



Use the graphs to estimate:

i. The melting point of ammonia

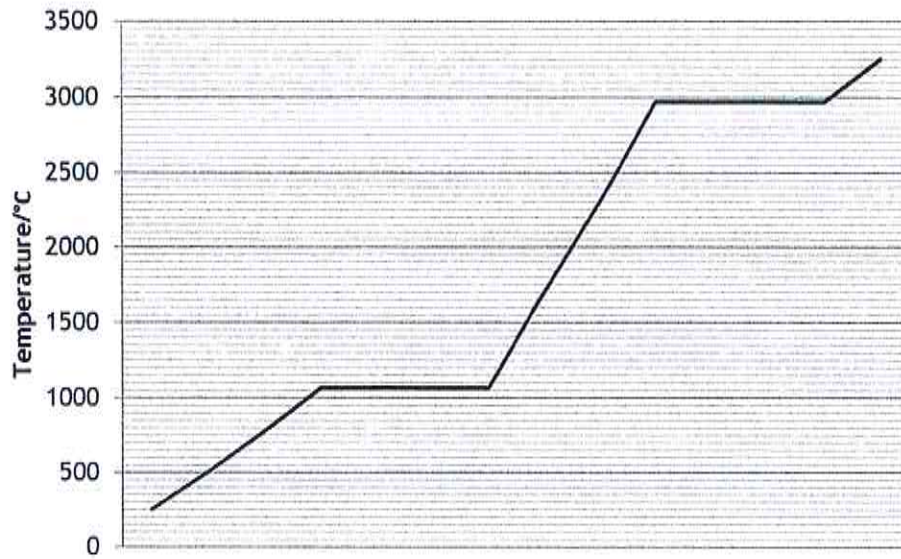
..... [1]

ii. The freezing point of methane

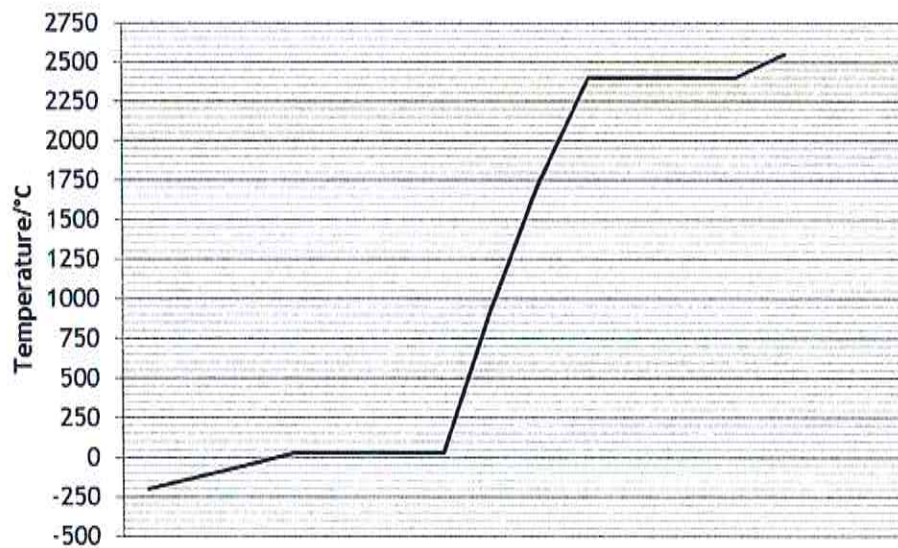
..... [1]

- c. The following graphs show how the temperatures of two metallic elements vary as they are heated:

Gold:

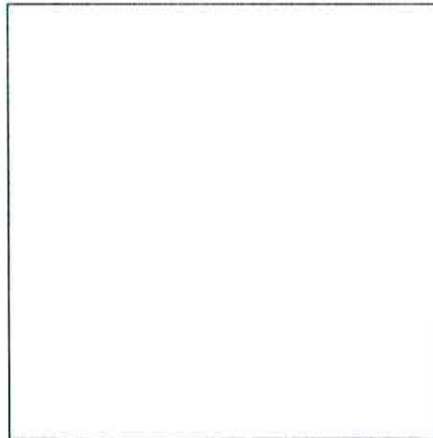


Gallium:



Draw diagrams to show how the particles are arranged in:

i. Gold at 3200°C



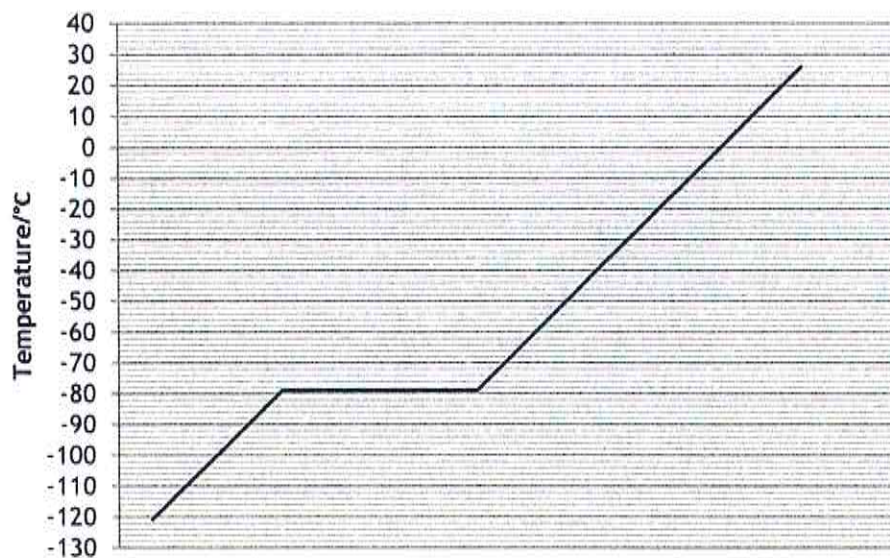
[2]

ii. Gallium at 5°C



[2]

- d. The following graph shows how the temperature of solid carbon dioxide (“dry ice”) varies as it is heated. The graph continues to increase linearly above 20 °C.



What does this tell us about solid carbon dioxide?

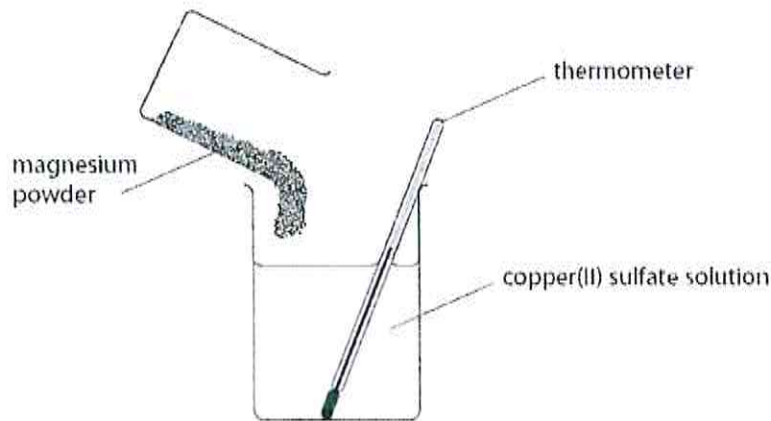
.....

..... [2]

[Total 10 Marks]

2. A student measured the change in temperature when magnesium powder was added to copper (II) sulfate solution.

She repeated the experiment with different masses of the magnesium powder.



- a. Name two variables that should be kept constant in order to ensure the experiment is a fair test.

-
- [2]

- b. Write a word equation for the reaction.

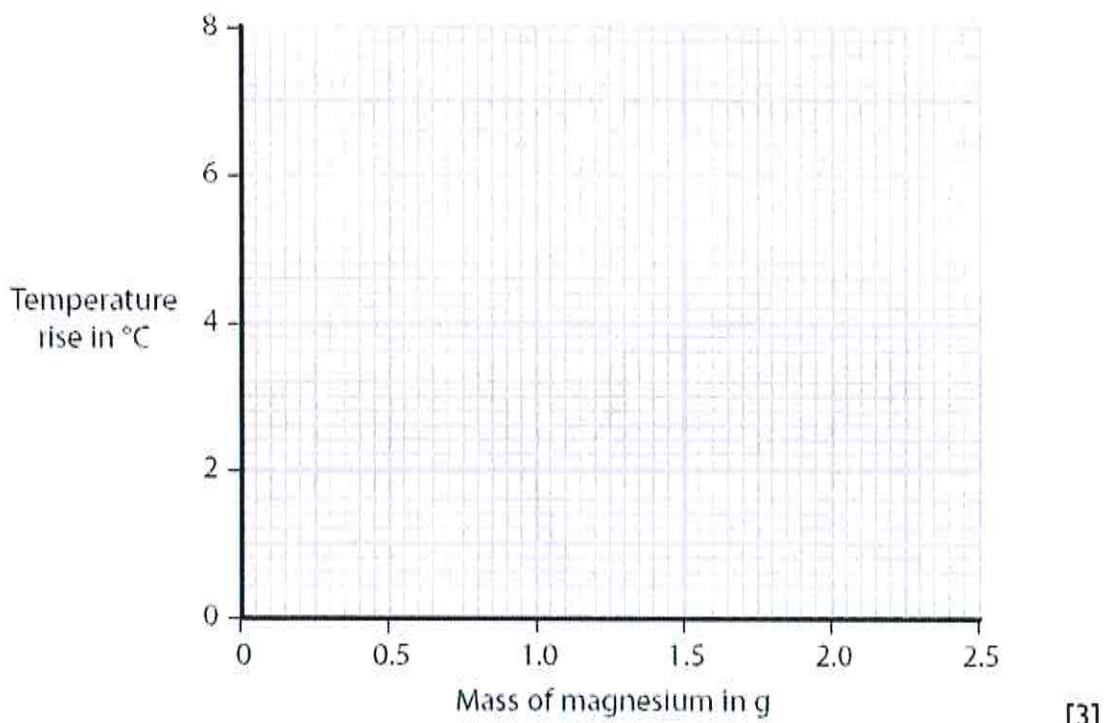
..... [2]

The following table shows her results:

Mass of magnesium in g	Temperature rise in °C
0.5	2
1.0	4
1.5	6
2.0	6
2.5	6

- c. i. Plot these results on the grid.

Draw a straight line through the first three points, and a straight line through the last three points. Make sure that the two lines cross.



ii. Use your graph to estimate the mass of magnesium required to produce a temperature rise of 3°C

..... [1]

d. Suggest why the last three temperature rises were the same.

.....
 [1]

e. How would you expect the results of the experiment to differ if zinc powder was used instead of magnesium?

Explain your answer.

 [2]

[Total 11 Marks]

3. Sugars are a type of carbohydrate. Sucrose is an example of a type of sugar called a disaccharide. It is commonly found in sugar cubes and granulated sugar.

Sugars are soluble in water and as such are often used as sweeteners in drinks.

- a. Sucrose has the molecular formula $C_{12}H_{22}O_{11}$. It is made up of carbon and two other elements.

Identify these two other elements.

.....

[2]

- b. An example of a drink in which sugars are found is coke. The nutritional information in the table below is for 100 ml of coke.

Energy (kJ)	Energy (kcal)	Carbohydrate (g)	of which sugars (g)	Salt (g)
180	42	10.6	10.6	0

Given the nutritional information above, calculate the equivalent number of sugar cubes dissolved in a 500 ml bottle of coke. You should assume that a sugar cube has a mass of 4 g.

[3]

- c. A student decided to investigate how quickly sugar dissolves in water. He decided to compare how quickly sugar cubes dissolve in comparison to granulated sugar. To do this he added one 4 g sugar cube and 4 g of granulated sugar to separate beakers of water. He then stirred consistently whilst measuring the time it took for the sugar to disappear.

State two things that the student must keep the same to make the experiment a fair test.

-
-

[2]

d. The student found that the granulated sugar took less time to dissolve than the sugar cube. They suggested that the reason for this was that the granulated sugar had a greater surface area than the sugar cube.

i. A sugar cube has dimensions of 1.5 cm x 1.5 cm x 1.5 cm. Calculate the surface area of a sugar cube, giving your answer in units of cm^2 .

[2]

ii. An individual granule of sugar has dimensions of 0.15 cm x 0.15 cm x 0.15 cm. Calculate the surface area of a granule of sugar, giving you answer in units of cm^2 .

[2]

iii. Assuming that 4 g of granulated sugar takes up the same volume as a sugar cube, work out how many granules of sugar there are 4 g of granulated sugar.

[3]

iv. Calculate the total surface area of the 4 g of granulated sugar.

[1]

- e. For the sugar to dissolve, particles of water must collide with particles of sugar. Suggest why the 4 g of granulated sugar takes less time to dissolve than the 4 g sugar cube.

.....

.....

.....

..... [2]

[Total 17 Marks]

[Total 38 Marks]

END OF TEST

NOW GO BACK AND CHECK YOUR WORK



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ENTRANCE SCHOLARSHIPS EXAMINATION 2015

ENGLISH

1 Hour 45 Minutes

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 and close-analysis – 60 minutes, 50 marks

Read the following passage from Charlotte Bronte's novel *Jane Eyre* and answer the questions that follow. In the passage the young narrator, Jane, is describing her first year at a new school.

My first quarter at Lowood seemed an age; and not the golden age either; it comprised an irksome struggle with difficulties in habituating myself to new rules and unwonted tasks. The fear of failure in these points harassed me worse than the physical hardships of my lot, though these were no trifles.

During January, February, and part of March, the deep snows, and, after their melting, the almost impassable roads, prevented our stirring beyond the garden walls, except to go to church; but within these limits we had to pass an hour every day in the open air. Our clothing was insufficient to protect us from the severe cold: we had no boots, the snow got into our shoes and melted there: our ungloved hands became numbed and covered with chilblains, as were our feet: I remember well the distracting irritation I endured from this cause every evening, when my feet inflamed; and the torture of thrusting the swelled, raw, and stiff toes into my shoes in the morning. Then the scanty supply of food was distressing: with the keen appetites of growing children, we had scarcely sufficient to keep alive a delicate invalid. From this deficiency of nourishment resulted an abuse, which pressed hardly on the younger pupils: whenever the famished great girls had an opportunity, they would coax or menace the little ones out of their portion. Many a time I have shared between two claimants the precious morsel of brown bread distributed at tea-time; and after relinquishing to a third half the contents of my mug of coffee, I have swallowed the remainder with an accompaniment of secret tears, forced from me by the exigency of hunger.

Sundays were dreary days in that wintry season. We had to walk two miles to Brocklebridge Church, where our patron officiated. We set out cold, we arrived at church colder: during the morning service we became almost paralysed. It was too far to return to dinner, and an allowance of cold meat and bread, in the same penurious proportion observed in our ordinary meals, was served round between the services.

At the close of the afternoon service we returned by an exposed and hilly road, where the bitter winter wind, blowing over a range of snowy summits to the north, almost flayed the skin from our faces.

I can remember Miss Temple walking lightly and rapidly along our drooping line, her plaid cloak, which the frosty wind fluttered, gathered close about her, and encouraging us, by precept and example, to keep up our spirits, and march forward, as she said, "like stalwart soldiers." The other teachers, poor things, were generally themselves too much dejected to attempt the task of cheering others.

Glossary of words that may be unfamiliar

<i>Irksome</i>	<i>irritating or annoying</i>
<i>Unwonted</i>	<i>unusual</i>
<i>Exigency</i>	<i>urgent need</i>
<i>Penurious</i>	<i>poor, extremely impoverished</i>
<i>Precept</i>	<i>a rule</i>
<i>Stalwart</i>	<i>reliable, strong, loyal</i>

Questions on the passage

1. Based on your reading of the passage, what sort of school does Lowood seem to be?
(10 marks)

2. What do you learn about the character of Jane from the first paragraph of the passage?
(10 marks)

3. Describe in your own words the 'abuse' that the narrator describes in the second paragraph.
(10 marks)

3. Select **two** descriptive phrases that you think are particularly effective and explain why.
(10 marks total: 5 marks for each example)

4. What impression do you have of the character of Miss Temple from your reading of the final paragraph?
(10 marks)

*** START A NEW PIECE OF PAPER FOR SECTION B ***

SECTION B: Composition – 45 minutes, 50 marks.

25 marks will be awarded for **content** and 25 marks for **quality and accuracy of writing**.

Choose **one** of the composition tasks below.

1) Discursive writing

Discuss the role of technology in your life.

2) Persuasive writing

'Children should spend less time playing, more time working.' Argue for or against this view.

3) Creative

'The Empty Room' – write a short story with this as the title.

4) Descriptive

Describe the sights, sounds and atmosphere of a city you know well.



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FRENCH

1 Hour

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.

L'année dernière, François, Claude et son père ont passé une semaine de vacances au pays de Galles.

Ils avaient trouvé un gîte sur Internet (qu'ils avaient réservé) avec trois chambres, deux salles de bain, un salon spacieux, une cuisine moderne, une cave et un beau jardin. Pour une maison qui donnait sur la mer et qui se situait près d'une station balnéaire très pittoresque, la location était très bon marché.

La visite au parc d'attractions était le temps fort des vacances. Le parc se situait à côté de la station balnéaire, ils avaient pu y aller plusieurs fois et à chaque fois, ils s'y étaient beaucoup amusés. Cependant, le coût de l'entrée était assez élevé et les restaurants étaient tous très chers. Ils ont donc décidé que s'ils revenaient, ils iraient pendant les petites vacances car l'été il y a beaucoup trop de queue et on doit attendre des heures avant de pouvoir monter dans une attraction.

Cette année, ils ont voulu aller en France au mois d'août mais ce n'était pas possible à cause de François et son tournoi de foot. A la place, ils ont décidé d'aller au Portugal en juillet. Ils prendront l'avion et resteront dans un hôtel de luxe au sommet d'une colline. Bien que le vol pour Lisbonne ne dure que deux heures, ils se demandent si une semaine sera assez pour pouvoir se reposer complètement. François et Claude ont quand même hâte de voir arriver les vacances et de se baigner dans la piscine de l'hôtel.

(30 marks)

*PLEASE START ANOTHER SHEET OF PAPER AND WRITE ON
ALTERNATE LINES*

2. Translate the following sentences into French:

- a) He is called David
- b) We drink the lemonade
- c) They write a letter to Paul
- d) She was going to school
- e) The girl used to swim
- f) I was eating some meat
- g) Alice went to the cinema
- h) The televisions do not work
- i) They have seen the film
- j) We had decided to leave
- k) She had stayed in the house
- l) I am going to laugh
- m) Jean is going to play rugby
- n) It is going to snow tomorrow
- o) The boys will be intelligent

(30 marks)

PLEASE START ANOTHER SHEET OF PAPER AND WRITE ON ALTERNATE LINES

3. You recently went to the zoo in France. Write an article for your school magazine talking about your day out.

You should include details about:

- **When you went and how you travelled to the zoo**
- **Where the zoo was exactly**
- **Who did you go with**
- **What you saw and did**
- **Whether you liked it and will you return**

(40 marks)

The account may be true or imaginary.

No credit will be given for pre-learnt but 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.

Please do not write more than 150 words. You should concentrate on accuracy (and quality rather than quantity).



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ENTRANCE SCHOLARSHIPS EXAMINATION 2015

GEOGRAPHY

90 Minutes

GENERAL INSTRUCTIONS:

*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

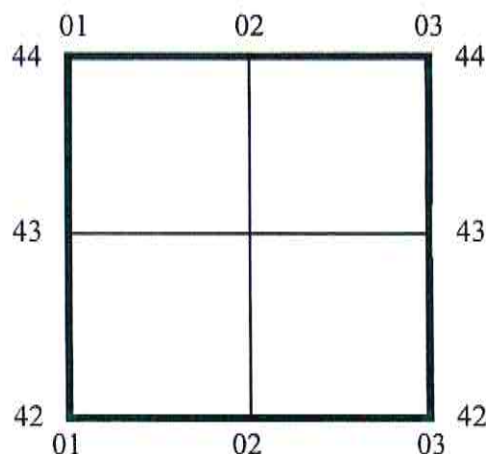
QUESTION 1

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

Use the OS map extract showing part of the Norfolk Coast, and the map key provided, to answer the following questions:

- (a) A visitor uses the A149 to travel from the visitor centre in Morston to the visitor centre at Cley next the sea.
- (i) Give the four figure grid reference of the visitor centre in Morston. [1]
 - (ii) Give the six figure grid reference of the visitor centre in Cley next the Sea. [1]
 - (iii) In which direction is the visitor travelling? [1]
 - (iv) How many kilometres will the visitor have travelled? [2]
- (b) (i) What is located at 020428? [1]
- (ii) Mark and name this feature on the grid below, along with: [4]

The Main Road
The Secondary Road
The Non-Roman Historical Feature



- (c) (i) What depositional landform extends out from the coastline in grid square 0445? [1]
- (ii) What material is this depositional landform made out of? [1]
- (iii) Explain the formation of this depositional landform. [4]
- (d) Using map evidence, explain how the area shown on the map is protected from visitor pressure. [4]

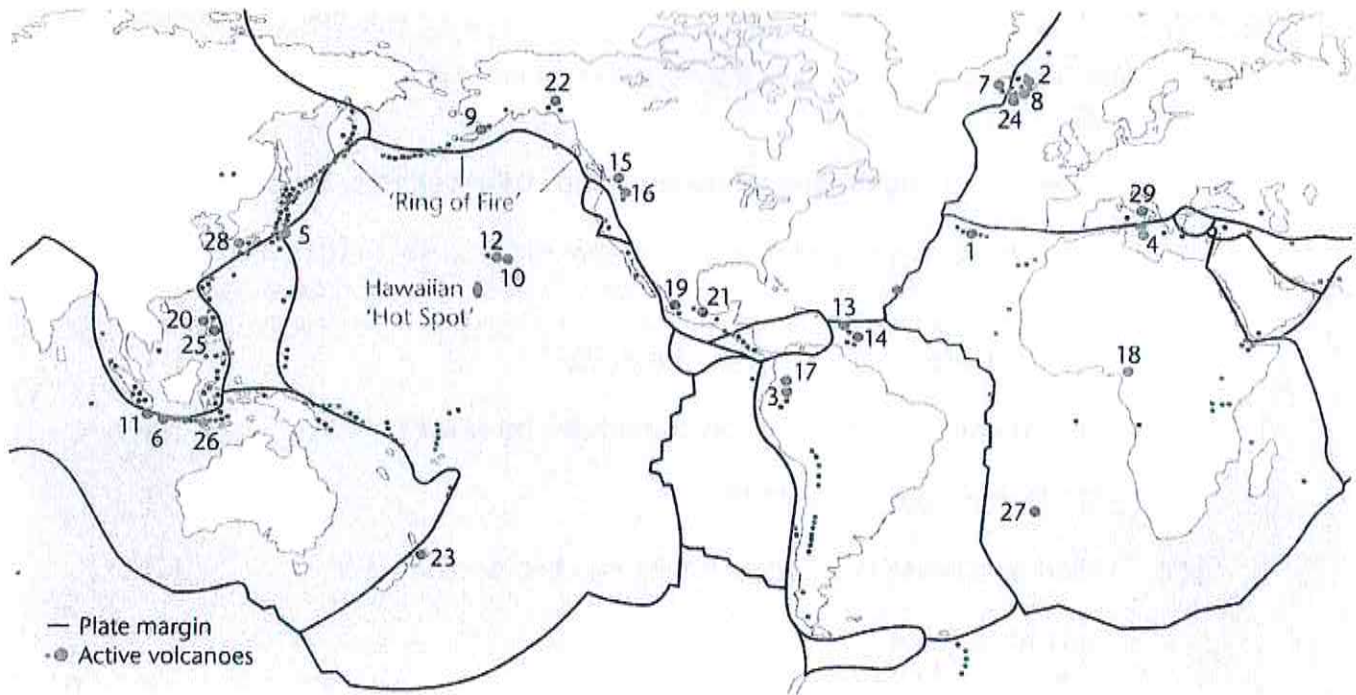
[Total: 20 marks]

END OF QUESTION 1

QUESTION 2

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

Study **Figure 1** below, which illustrates the global distribution of active volcanoes.



1 Azores	6 Galunggung	11 Krakatoa	16 Mt St Helens	21 Popocatepetl	26 Tambora
2 Bardarbunga	7 Grímsvötn	12 Mauna Loa	17 Nevado del Ruiz	22 Redoubt	27 Tristan da Cunha
3 Cotopaxi	8 Haemaey	13 Soufrière Hills	18 Nyos	23 Ruapehu	28 Unzen
4 Etna	9 Katmai	14 Mt Pelée	19 Parícutin	24 Surtsey	29 Vesuvius
5 Fujiyama	10 Kilauea	15 Mt Rainier	20 Pinatubo	25 Taal	

Figure 1

- (a) Describe the global distribution of active volcanoes. [4]
- (b) Explain why active volcanoes, like Bardarbunga in Iceland, are found at constructive plate boundaries. [3]
- (c) Suggest why volcanism is found in Hawaii, away from plate boundaries. [3]
- (d) Many people continue to live near active volcanoes.
- (i) What are the benefits of living near an active volcano? [4]
- (ii) Why can people living in volcanically active areas be more confident of their own safety in the 21st century? [6]

[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) Fracking for shale gas in the UK is essential and should be supported at all costs. Discuss. [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 a successful human response to **either** a volcanic eruption, **or** an earthquake event? [20]

OR

- d) Describe and explain the variations in temperature and rainfall across the UK. [20]

OR

- e) Expand on the importance of Geography to government ministers and policy makers in the UK. [20]

[Total: 20 marks]

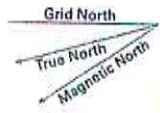
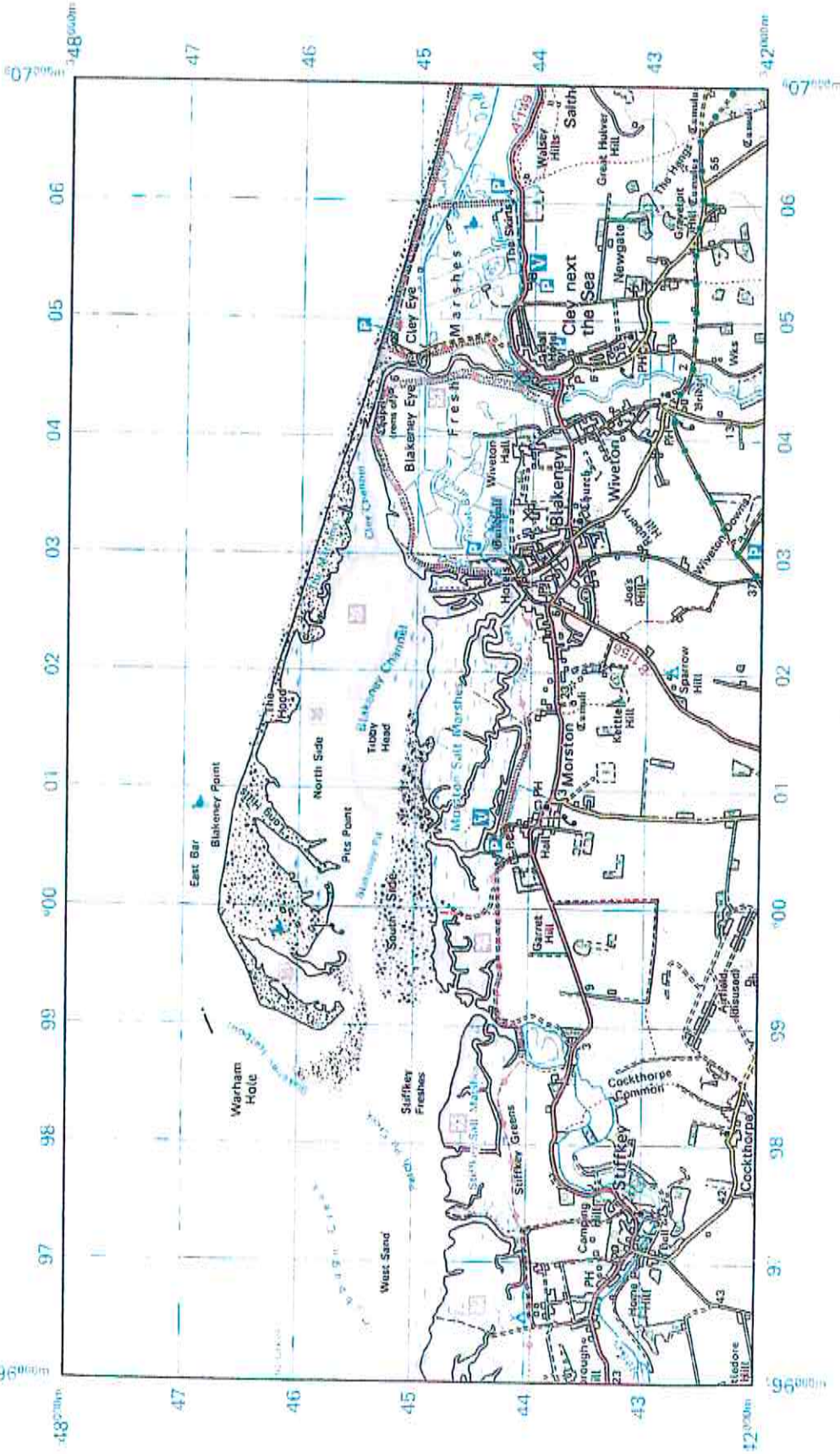
[Exam Total: 60 marks]

END OF EXAMINATION

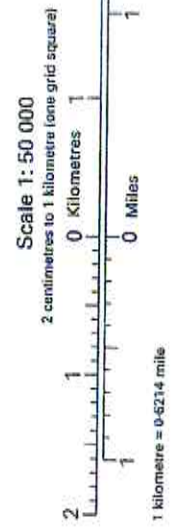


Four colours should appear above; if not then please return to the investigator.
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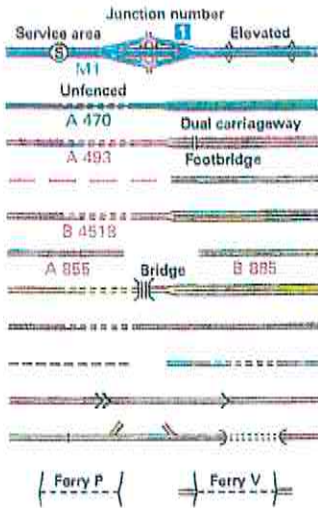
1:50 000 Scale
Landranger Series



Diagrammatic only



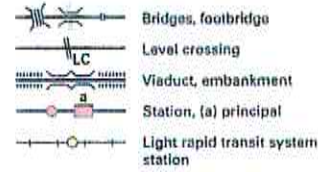
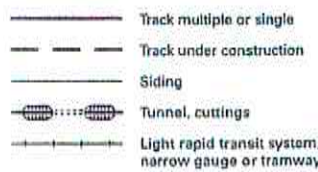
ROADS AND PATHS



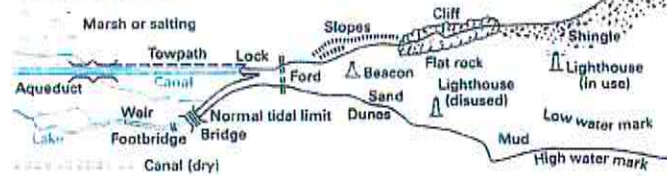
Not necessarily rights of way

- Motorway (dual carriageway)
- Primary Route (recommended through route)
- Main road
- Road under construction
- Secondary road
- Narrow road with passing places
- Road generally more than 4m wide
- Road generally less than 4m wide
- Path / Other road, drive or track
- Gradient: steeper than 20% (1 in 5), 14% to 20% (1 in 7 to 1 in 5)
- Gates, Road tunnel
- Ferry (passenger), Ferry (vehicle)

RAILWAYS



WATER FEATURES



HEIGHTS

Contours are at 10 metres vertical interval
 Heights are to the nearest metre above mean sea level

Where two heights are shown the first height is to the base of the triangulation pillar and the second (in brackets) to the highest natural point of the hill

PUBLIC RIGHTS OF WAY

- Footpath
- Bridleway
- Restricted byway
- Byway open to all traffic

The symbols show the defined route so far as the scale of mapping will allow.

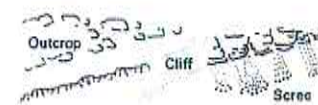
The representation on this map of any other road, track or path is no evidence of the existence of a right of way. Not shown on maps of Scotland

Danger Area Firing and Test Ranges in the area. Danger! Observe warning notices.

BOUNDARIES

- National
- District
- County, Unitary Authority, Metropolitan District or London Borough
- National Park

ROCK FEATURES



OTHER PUBLIC ACCESS

- Other route with public access (not normally shown in urban areas). Alignments are based on the best information available. These routes are not shown on maps of Scotland.
- On-road cycle route
- Traffic-free cycle route
- National Cycle Network number
- Regional Cycle Network number
- National Trail, European Long Distance Path, Long Distance Route, selected Recreational Routes

HISTORICAL FEATURES

- Site of antiquity
- Battlefield (with date)
- Visible earthwork
- VILLA Roman
- Non-Roman

TOURIST INFORMATION

- Camp site / caravan site
- Garden
- Golf course or links
- Information centre (all year / seasonal)
- Nature reserve
- Parking, Park and ride (all year / seasonal)
- Picnic site
- Recreation / leisure / sports centre
- Selected places of tourist interest
- Telephone, public / roadside assistance
- Viewpoint
- Visitor centre
- Walks / Trails
- World Heritage site or area
- Youth hostel

LAND FEATURES

- Electricity transmission line (pylons shown at standard spacing)
- Pipe line (arrow indicates direction of flow)
- Buildings
- Important building (selected)
- Bus or coach station
- Current or former place of worship (with tower, with spire, minaret or dome)
- Place of worship
- Glass structure
- Heliport
- Triangulation pillar
- Mast
- Wind pump, wind turbine
- Windmill with or without sails
- Graticule intersection at 5' intervals
- Cutting, embankment
- Landfill site or slag/spoil heap
- Coniferous wood
- Non-coniferous wood
- Mixed wood
- Orchard
- Park or ornamental ground
- Forestry Commission land
- National Trust (always open / limited access, observe local signs)
- National Trust for Scotland (always open / limited access, observe local signs)

ABBREVIATIONS

- | | | | |
|-----|-------------|-----|-------------------------------------|
| Br | Bridge | MS | Milestone |
| Cem | Cemetery | MUS | Museum |
| CG | Cattle grid | P | Post office |
| CH | Clubhouse | PC | Public convenience (in rural areas) |
| Fm | Farm | PH | Public house |
| Hc | House | Sch | School |
| MF | Milepost | TH | Town Hall, Guildhall or equivalent |



HARROW
SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2015

HISTORY

90 Minutes

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

Study Sources A and B and then answer both questions

SOURCE A

At the start of the twentieth century, Iran was ruled by a Shah. It was an independent country, but its oil fields were controlled by the British company Anglo-Iranian Oil, which paid the Shah's government for the right to operate them. After the Second World War, an increasing number of Iranians demanded that their government take over the oil fields. They insisted that Iranians should receive at least half of the oil profits. The leading Iranian nationalist Mohammed Mossadeq said: 'The oil resources of Iran, like its soil, its rivers and mountains, are the property of the people of Iran.' He gained huge popular support and in 1951 the Shah made him Prime Minister. The Iranian Parliament then passed a law to nationalise the oil industry. This defiant move thrilled the Iranians. Many in the Arab world also applauded and Mossadeq became a hero to millions, both in and beyond Iran. In retaliation Anglo-Iranian Oil withdrew its workforce and refused to allow any of its technicians to work with the new Iranian National Oil Company. The British also persuaded other western oil companies not to buy Iran's oil and the British navy imposed a blockade of Iran's ports, refusing to allow any ships to enter or leave.

From Modern World History by Ben Walsh, published in 2013

SOURCE B



A British cartoon, published in The Daily Mail in October 1951. The animal in the kennel represents the British Prime Minister Clement Attlee. The bag is marked 'Anglo-Iranian' and the man is marked 'Mossadeq'.

1. What do you understand by the terms 'nationalist' and 'nationalise', used by the author of Source A? If you do not know, have a guess, as marks will be awarded for intelligent answers even if they are incorrect. [10 marks]
2. What is the message of the cartoon in Source B? In your answer try to comment on the cartoonist's opinion of Mossadeq and of Britain, and also on his overall message. [20 marks]

SECTION B

Answer **ONE** of these questions.

Either

(3) Does a country need to be powerful in order to play an influential role in History? Use any period or periods of History you have studied to answer this question. [30 marks]

or

(4) Winston Churchill said that 'History is written by the victors.' Was he correct? Use any period or periods of History you have studied to answer this question. [30 marks]

SECTION C

(5) Read the following passage from the BBC News website about the controversy over Winston Churchill and the Bengal Famine.

In 1943, India, then still a British possession, experienced a disastrous famine in the north-eastern region of Bengal, which was sparked by the Japanese occupation of Burma the year before. At least three million people are believed to have died, and the actions of the Prime Minister Winston Churchill (or lack thereof) have been the subject of criticism. Madhusree Mukerjee, author of *Churchill's Secret War*, has said that despite refusing to meet India's need for wheat, Churchill continued to insist that it exported rice to fuel the war effort: 'The War Cabinet ordered the build-up of a stockpile of wheat for feeding European civilians after they had been liberated. So 170,000 tons of Australian wheat bypassed starving India - destined not for consumption but for storage.' 'It's one of the worst blots on his record,' says Richard Toye, author of *Churchill's Empire*. 'It was difficult for people to get him to take the issue seriously. He viewed it as a distraction. Preoccupied with battling Germany in Europe, he didn't want to be bothered by it when people raised the issue.' However, Allen Packwood, Director of the Churchill Archives Centre, comments: 'It was a horrendous event but it needs to be seen in context. Churchill is running a global war at this point and there are always going to be conflicting priorities and demands. It's an incredibly complex and evolving situation, and he's not always going to get everything right.' Arthur Herman, author of *Gandhi & Churchill*, has argued that without Churchill the famine would have been worse. Once he was fully aware of the famine's extent, 'Churchill and his cabinet sought every way to alleviate the suffering without undermining the war effort.'

Now choose a controversial historical character or event from any period of History you have studied or read about. Explain the controversy, outlining both sides of the argument, and say which side you come down on. [30 marks]



HARROW SCHOOL

ENTRANCE SCHOLARSHIPS EXAMINATION 2015

LATIN

90 Minutes

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 Story of Erysichthon (1): An Evil Deed

Erysichthon, a man with no regard for the gods, chopped down a sacred tree for no reason, persisting even when the tree groaned in pain.

1 olim Erysichthon, vir hostissimus deis, silvam Cereris securi¹ violavit.² in nemore³ deae
2 quercus⁴ ingens ac sacra stabat. saepe sub hac nymphae choreas ducebant,⁵ saepe etiam
3 manibus nexis⁶ truncum circumdabant. sed Erysichthon servibus imperavit ut arborem
4 sacram succiderent.⁷ ubi tamen vidit servos parere⁸ nolle, ille ex unius manu securem¹
5 ferociter erripuit.⁹ “quamquam haec arbor ipsa dea est” inquit, “nunc summum caput in
6 terram cadet!”¹⁰ tum Cereris quercus⁴ contremuit¹¹ et gemitum¹² dedit. glandes¹³ ac¹⁴
7 frondes pallescere¹⁵ coeperunt et rami¹⁶ qui antea validi fuerant nunc albi¹⁷ et infirmi erant.
8 itaque vulnere in trunco facto sanguis¹⁸ e cortice¹⁹ fudit. stabant omnes attoniti. unus tum ex
9 servorum numero crimen sistere²⁰ fortiter conabatur ut arbori auxilium daret. Erysichthon
10 tamen iratus clamavit, “hic est praemium tuae mentis²¹ piaie!”²² ille ab arbore in virum

¹ securis, securis (f) = an axe

² violo, violare, violavi, violatus = to violate, injure, dishonour

³ nemus, nemoris (n) = a grove, glade

⁴ quercus, us (f) = an oak tree

⁵ choreas duco = to lead a dance

⁶ necto, nectere, nexi, nexus = to bind, tie, fasten together

⁷ succido, succidere, succidi, succisus = to cut down

⁸ pareo, parere, parui = to obey

⁹ eripio, eripere, eripui, ereptus = to snatch

¹⁰ cado, cadere, cecidi = to fall

¹¹ contremo, contremere, contremui = to tremble, shake

¹² gemitus, gemitus (m) = a groan, sigh

¹³ glans, glandis (f) = an acorn

¹⁴ frons, fondis (f) = a leaf, foliage, bough

¹⁵ pallesco, pallescere, pallui = to turn pale

¹⁶ ramus, rami (m) = a branch

¹⁷ albus, a, um = white

¹⁸ sanguis, sanguinis (m) = blood

¹⁹ cortex, corticis (m) = the bark of a tree

²⁰ sisto, sistere, stiti = to put a stop to

²¹ mens, mentis (f) = mind, heart

²² pius, a, um = loyal

11 gladium statim convertit²³ et servum tam vehementer percutit²⁴ ut caput e corpore

12 detruncaret.²⁵ cum quercum iterum atque iterum cecidisset,²⁶ sonus vocis e medio arbore

13 auditus est:

Questions on Passage One:

- a) How is Erysichthon described in line 1? [2]
- b) How did he offend the goddess Ceres? [2]
- c) What Latin word does *hac* (line 2) refer to? [1]
- d) Explain, in as much detail as you can, the actions of the nymphs [4]
- e) Explain what triggered Erysichthon's violent outburst in line 5. [4]
- f) Why do Erysichthon's words here (line 5) make his actions all the more terrible? [2]
- g) Judging by line 6, what must Erysichthon have begun to do after he had finished speaking?[1]
- h) How do the words *contremuit & gemitum dedit* add to the horror of Erysichthon's actions? [2]
- i) Explain how the appearance of the tree changed in lines 6-7. [4]
- j) Why are all the onlookers described as *attoniti*? [2]
- k) What did one of the slaves then do and why? [4]
- l) What happened to him as a result of his actions? [2]
- m) What did Erysichthon then proceed to do and what strange event occurred as a result? [4]
- n) From the passage, give in Latin one example of each of the following:
 - i. An imperfect subjective [1]
 - ii. A deponent verb [1]
 - iii. An adverb [1]
 - iv. An indirect command [1]
- o) Explain the case of *servibus* (line 3) [1]
- p) What is the nominative plural of the Latin word *caput*? [1]

[40 marks]

²³ *converto, convertere, converti, conversus* = to turn

²⁴ *percutio, percutere, percussi, percussus* = to strike, stab

²⁵ *detrunco, detruncare, detruncavi, detruncatus* = to cut off

²⁶ *caedo, caedere, cecidi, caesus* = to cut, hack

Question Two

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

The Story of Erysichthon (2): A Tree Nymph's Plea to the Goddess Ceres

"ego nympa sum, Cereri gratissima,¹ et sub ligno² huius arboris habito. moriens puto poenas³ factorum tuorum secuturas esse." vulnerata tandem ictibus⁴ innumeris arbor conlapsa est.⁵ sorores statim nympae omnes perterritae petentes poenam Erysichthonis Cererem adierunt. dea pulcherrima audivit. illa enim genus miserum poenae molita est⁶ ut fame⁷ Erysichthonem laceraret.⁸ dea tum ad se unam Oreada⁹ vocavit quod Fata Cererem Famemque convenire non sinunt.¹⁰ "est locus" inquit "in extremis oris¹¹ Scythiae¹² qui neque fruges¹³ neque arbores habet. hic Frigus¹⁴ Tremorque¹⁵ habitant. hic etiam Fames est. ego ad Famem te appropinquare iubeo rogantem ut in praecordia¹⁶ viri sacrilegi se ponat." nympa itaque in Scythiam veniens quaesitam¹⁷ Famem in agro lapidoso¹⁸ vellentem¹⁹ herbas unguibus²⁰ ac dentibus vidit.

[25 marks]

¹ gratus, a, um = dear, beloved

² lignum, ligni (n) = wood, timber

³ poena, poenae (f) = punishment, retribution

⁴ ictus, ictus (m) = a blow, strike

⁵ conlabor, conlabi, conlapsus sum = to collapse, fall down

⁶ molior, moliri, molitus sum = to devise, design

⁷ Fames, Famis (f) = Hunger

⁸ lacero, lacerare, laceravi, laceratus = to tear to pieces

⁹ Oreas, Oreadis (f) = a mountain nymph, an Oread. *Oreada* is accusative singular.

¹⁰ sino, sinere, sivi, situs = to allow, permit

¹¹ ora, orae (f) = a boader, boundary, edge

¹² Scythia, Scythiae (f) = Scythia (a region of north-eastern Europe on the northern shores of the Black Sea)

¹³ frux, frugis (f) = fruit

¹⁴ Frigus, Frigoris (n) = Cold

¹⁵ Tremor, Tremoris (m) = Trembling

¹⁶ praecordia, praecordiorum (n. pl) = the stomach

¹⁷ quaero, quaerere, quaesivi, quaesitus = to search for, look for

¹⁸ lapidosus, a, um = full of stones, stoney

¹⁹ vello, vellere, vulsi, vulsus = to pluck, tear at

²⁰ unguis, unguis (m) = a fingernail

Question Three

Read the following passage and answer the questions below.

1 Fames nunc Cereris iussa peragebat et miseri cubiculum statim intravit. cum noctis tempus
2 esset, Erysichthon in alto sopore¹ iacebat. Fames iam se viro inspiravit et in vacuis venis
3 cibi rabiem² posuit.
4 ubi itaque e somno excitatus erat³ omnia quae in manibus tenere poterat consumere⁴ valde⁵
5 cupivit. dum cibum consumit, consumere plus cibi poposcit.⁶
6 omnibus consumptis igitur ipse dentibus lacerare artus⁷ suos coepit. nullum tandem iam viri
7 miserabilis relictum est quod se omnem ipse ederat.⁸

Questions on Passage Three:

- a) What two things did Hunger now do? [2]
- b) What state was Erysichthon in and why? [2]
- c) Give a better translation of *se inspiravit* than “she breathed herself into”. [1]
- d) Given the context and using your knowledge of English derivatives, give a sensible translation of *in vacuis venis*. [2]
- e) Translate lines 4 to 5 (*ubi itaque ...poposcit*). [5]
- f) What would be a good English translation of *omnibus consumptis*? [2]
- g) Who does *ipse* refer to in line 6? [1]
- h) What do you think the word *dentibus* means? [1]
- i) Looking at the final sentence explain in your own words what has happened to Erysichthon and why. [2]
- j) What tense is the verb *poterat*? [1]
- k) What type of clause is *quod se omnem ipse ederat*? [1]

¹ sopor, soporis (m) = sleep

² rabies, rabiem (f) = rage, madness, frenzy (often followed by a genitive)

³ excito, excitare, excitavi, excitatus = to wake up, rouse

⁴ consumo, consumere, consumpsi, consumptus = to eat, consume, devour

⁵ valde = greatly

⁶ posco, poscere, poposci = to beg for, demand

⁷ artus, artus (m) = a limb, joint

⁸ edo, edere, edidi, editus = to eat, consume

l) Write down an English word that is derived from the following Latin words taken from the passage above:

- a. excitatus
- b. miserabilis
- c. Fames
- d. inspiravit
- e. Ceres

[25 Marks]

P.T.O.

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.

vis tamen illa mali postquam consumpserat omnem
materiam derantque gravi nova pabula morbo,
ipse suos artus lacerans divellere morsu
coepit et infelix minuendo corpus alebat.

- a) Is the passage above written in Latin prose or verse? [1]
- b) Which noun is the subject of line 1? [1]
- c) Read the two translations of this passage below. Write a short paragraph explaining which translation you find most effective and why. You may wish to start your answer by briefly explaining what you think the purpose of a translation is. [8]

Translation 1

But none of it was enough. Whatever he ate
Maddened and tormented that hunger
To angrier, uglier life. The life

Of a monster no longer a man. And so,
At last, the inevitable.
He began to savage his own limbs.
And there, at a final feast, devoured himself.

Ted Hughes *Tales From Ovid*

Translation 2

But after his violent affliction had wasted away the whole
Of his substance and nothing was left to fuel his virulent malady,
He finally started to bite his own limbs and tear them apart
With his jaws; the poor wretch nourished his body by making it smaller.

David Raeburn, *Metamorphoses*

P.T.O.

Question Five

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

- a) The goddess thought that the rewards were very great. [5]
- b) The sisters were guarding the wood in order to help the nymphs. [5]

Total marks: 100



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ENTRANCE SCHOLARSHIPS EXAMINATION 2015

MATHEMATICS I

90 Minutes

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. (a) Multiply out and simplify

(i) $a^2(3a + 8) - 2a(4a^2 + 7)$

(ii) $\frac{4b^2}{a} \times 3ab^2$

(b) Factorise

(i) $6pq - 9p^2$

(ii) $3p(8 + p) - 5p(4 - 3p)$

(c) If $a = -3, b = 14, c = \frac{1}{2}$ then evaluate

(i) abc^2

(ii) $bc - a^2$

2. A rectangle has length x cm, width y cm and perimeter 73cm. A second rectangle has length one third of the first rectangle and width twice the first rectangle, its perimeter is 36cm. Showing your working clearly, write down and solve two equations to work out x and y .

3. Find the areas of the following shapes

(a) A square with diagonals of 6cm

(b) An equilateral triangle with sides of length 2cm

(c) A regular hexagon with sides of length 4cm

(d) An isosceles trapezium with sides of length 13cm, 5cm, 7cm and 5cm

4 (a) In 2014 a squash club had 130 members, each of whom paid a yearly fee of £280. In 2015 the club put up its yearly fee by 20%. Some members were reluctant to re-join the club with the increased fee and consequently the membership dropped by 10%. Determine whether the total of the members fees increased or decreased and by how much.

(b) A shopkeeper pays £3.20 for 20 eggs. He finds that $\frac{1}{4}$ of them are broken, but sells each of the remainder at a price equivalent to £3.60 per dozen (12). Calculate his percentage profit.

(c) Tom sold his house to Dick at a profit of 10%. Dick sold it to Harry at a profit of 5%. Harry paid £41850 more for the house than Tom. How much did Tom pay for the house?

5. (a) Simplify $\frac{x}{5} + \frac{7x}{10}$

(b) $T = 1.1(C - 7.4)$; calculate C when $T = 22.44$

(c) Rearrange $y + 2x = 3c$ so that x is the subject.

(d) Solve $3(7x + 1) - 6(4x - 5) = \frac{1}{2}(x + 24)$

6. A teacher has the following list of marks (out of 20): 13, 9, 14, 17, 20, 15, 18, 14
- Calculate the mean mark.
 - Which two marks could be removed without changing the mean?
 - State the median and the mode
 - The teacher re-tested the same class the following week. The new results (out of 20) were
 mean = 13.5 median = 17 mode = 5 range = 15
 Giving reasons for your answer, explain whether you think the class did better or not on the re-test?

7. The whole of this question should be answered on a sheet of squared paper.

Draw a set of axes, each one from -5 to 5 and using a scale of 1cm to 1 unit. On your axes draw and label the triangle T whose vertices are $(0,2)$ $(2,1)$ and $(3,2)$.

- M is the image of T after a reflection in the line $y = 1$. P is the image of M after a reflection in the line $y = -x$. Draw and label the triangles M and P .
 - State precisely the single transformation which maps T onto P .
 - R is the image of T after a rotation of 180° about $(0,2)$. S is the image of T after a rotation of 180° about $(2,0)$. Draw and label the triangles R and S .
 - State precisely the single transformation which maps R onto S .
8. A firm manufactures x thousands of hats per week. The revenue (R) is money generated from selling the hats. The cost (C) is money spent making the hats. Both of these quantities are measured in thousands of pounds and are given by the formulae:

$$R = \frac{4x}{x+1} \quad \text{and} \quad C = \frac{1}{2}x + 1$$

Calculate values for R and C when $x = 0, 1, 2, 3, 4$ and 5

Draws appropriately sized axes and plot a graph of R and a graph of C on the same axes, using the y -axis for both R and C .

The profit (P) made by the hat firm is $P = R - C$ thousands of pounds.

From your graph and showing your method clearly estimate

- the minimum and the maximum number of hats the firm must make per week in order to make a profit;
 - the greatest weekly profit the firm can make.
9. Showing your reasoning and working clearly, estimate whether you could carry 1 kilometre of toilet paper.



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ENTRANCE SCHOLARSHIPS EXAMINATION 2015

MATHEMATICS II

90 Minutes

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; correct answers on their own will earn few marks. You will be marked more on the PRESENTATION of your solutions, the EXPLANATION of your working and the JUSTIFICATION of your final answers.

1. (a) Show a quick way to calculate

(i) $353 \times 762 + 353 \times 238$

(ii) $74^2 - 74 \times 54$

(b) Given that $402 \times 936 = 376272$, find

(i) 4.02×93.6

(ii) $376.272 \div 0.00936$

(iii) $\frac{1}{402} - \frac{1}{936}$

2. (a) Factorise $10x - 4x^2$

(b) Simplify (i) $\frac{10x-4x^2}{8x}$ (ii) $\frac{2x^2-4x}{12x-6x^2}$

(c) Solve $\frac{7-x}{3} - \frac{3+x}{4} = 1\frac{1}{2}$

3. I have some pencils and some jars.

If I put 4 pencils into each jar I will have one jar left over.

If I put 3 pencils into each jar I will have one pencil left over.

How many pencils and how many jars do I have?

4. Ann is a very competitive person and does the crossword in her newspaper every day. She decides to give herself 2 points for every crossword that she completes correctly and to forfeit 3 points for every crossword that she completes incorrectly or cannot complete.

After 30 days of working the puzzles, Ann has a score of zero. How many puzzles has she solved correctly?

5. Five animals: Aardvark, Bear, Cat, Dog and Eagle are weighed in pairs, in all possible combinations. When the recorded weights were added together, the total was 420kg.

(a) How many times was the aardvark weighed?

(b) What is the combined weight of the 5 animals

(c) If they are now weighed in threes in all possible combinations, how many times will the aardvark be weighed and what will be the sum of the weighings?

6. (a) It takes Jimmy 20 minutes to cycle from his house to the shop, but 28 minutes if he goes to the cinema which is 2km further. Assuming he always cycles at the same speed then find how far the shop is from Jimmy's house.
- (b) It takes Paul 20 minutes to cycle to the cinema from his house. However, on the way back it takes him 25 minutes as he goes 2kmh slower. How far is the cinema from his house?

7. Solve

(a) $x^2 = 3x$

(b) $x - 1 = 2\sqrt{x - 1}$

(c) $\frac{2}{x-7} = \frac{3}{x+5}$

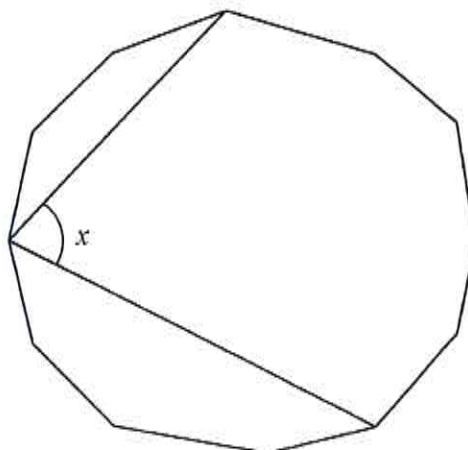
8. A farmer ties his goat to the outside corner of the shed in his field. The shed is square shaped in plan view with each side 3 metres. If the length of the rope attaching the goat to the shed is 1 metre then find the area of ground that the goat can graze.

If the length of the rope was instead 4 metres, then what is the area the goat can reach?

9. Solve simultaneously

$$y = \frac{7}{x}, \quad y - 3 = \frac{9}{x}$$

10. (a) Given that the sum of the interior angles of a triangle is 180° , show that the sum of the interior angles in a quadrilateral is 360° and find the sum of the interior angles in a pentagon.
- (b) Produce a formula for the sum of the interior angles of p sided polygon.
- (c) The diagram shows a regular dodecagon (a polygon with twelve equal sides and equal angles). What is the size of the angle marked x ?





HARROW
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ENTRANCE SCHOLARSHIPS EXAMINATION 2015

PHILOSOPHY AND APPLIED ETHICS

90 Minutes

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.*

You have 30 minutes to read through the three articles and then one hour to answer the question. Do take time to plan and draft your answer.

1. Auschwitz: a short history of the largest mass murder site in human history

On 27 January 1945 Soviet soldiers entered the gates of the Auschwitz concentration camp complex in south-west Poland. The site had been evacuated by the Nazis just days earlier. Thus ended the largest mass murder in a single location in human history.

Precise numbers are still debated, but according to the [US Holocaust Memorial Museum](#), the German SS systematically killed at least 960,000 of the 1.1-1.3 million Jews deported to the camp. Other victims included approximately 74,000 Poles, 21,000 Roma, 15,000 Soviet prisoners of war and at least 10,000 from other nationalities. More people died at Auschwitz than at any other Nazi concentration camp and probably than at any death camp in history.

The Soviet troops found grisly evidence of the horror. About 7,000 starving prisoners were found alive in the camp. Millions of items of clothing that once belonged to men, women and children were discovered along with 6,350kg of human hair. The Auschwitz museum holds more than 100,000 pairs of shoes, 12,000 kitchen utensils, 3,800 suitcases and 350 striped camp garments.

In January 1942, the Nazi party decided to roll out the “Final Solution”. Camps dedicated solely to the extermination of Jews had been created before, but this was formalised by SS Lieutenant General Reinhard Heydrich in a speech at the Wannsee conference. The extermination camp Auschwitz II (or Auschwitz-Birkenau) was opened in the same year.

With its sections separated by barbed-wire fences, Auschwitz II had the largest prisoner population of any of the three main camps. In January 1942, the first chamber using lethal Zyklon B gas was built on the camp. This building was judged inadequate for killing on the scale the Nazis wanted, and four further chambers were built. These were used for systematic genocide right up until November 1944, two months before the camp was liberated.

This is not the limit of the horrors of Auschwitz I. It was also the site of disturbing medical experimentation on Jewish and Roma prisoners, including castration, sterilisation and testing how they were affected by contagious diseases. The infamous “Angel of Death”, SS captain Dr Josef Mengele, was one of the physicians practising here. His particular interest was experimenting on twins.

According to the numbers provided by the US Holocaust Memorial Museum, Auschwitz was the site of the most deaths (1.1 million) of any of the six dedicated extermination camps. By these estimates, Auschwitz was the site of at least one out of every six deaths during the Holocaust. The only camp with comparable figures was Treblinka in north-east Poland, where about 850,000 are thought to have died.

The third camp, Auschwitz III, also called Monowitz, was opened in October 1942. It was predominantly used as a base for imprisoned labourers working for the German chemical company IG Farben. According to the Auschwitz-Birkenau memorial museum, an estimated 10,000 labourers are thought to have died there. Once they were judged incapable of work, most were killed with a phenol injection to the heart.

The SS began to evacuate the camp in mid-January 1945. About 60,000 prisoners were forced to march 30 miles westwards where they could board trains to other concentration camps. The US Holocaust Memorial Museum estimates 15,000 died during the journey, with the Nazis killing anyone who fell behind.

More than 7,000 Nazi personnel are thought to have served at Auschwitz but just a few hundred have been prosecuted for the crimes committed there. The pursuit of justice has not ceased, with German justice officials saying in 2013 that there were 30 surviving Auschwitz officials who should face prosecution.

2. Survivors remember Auschwitz: 'Every time I come here I feel fearful'

For Arek Hersh the passing of 70 years has not diminished the fear Auschwitz instilled upon him as a child in 1944.

Back then he was just 14 when he arrived at Nazi Germany's most infamous death camp with dozens of other Jewish children who had been separated from their families by the Holocaust.

"I shudder every time I think about this place. I can't control the fear. Every time I come here I feel fearful," the 85 year-old told The Telegraph as he joined other survivors at the camp to mark the anniversary of its liberation by the Soviet Red Army in 1945.

"When I think about what happened to me all those years ago. In 1944 I came to Auschwitz with 185 children: only two got out, and I was one of them.

Arriving at the main entrance at the Birkenau complex he managed to stick with the group deemed "healthy" by the SS and was so spared instant dispatch in the gas chambers. Shaved, stripped of all his possessions and with the number B7608 tattooed on his arm he became an Auschwitz prisoner.

"It's now been 70 years but back then I really didn't think I would make it," he continued. "When I walked out of Auschwitz in January 1945 on the Death March it was -9 Fahrenheit and I was just in the 'pyjamas' that consisted the camp's uniform. People died from cold others who fell behind were shot in the back of the head.

"When I think of all the terrible things that happened to us: how we lived, how we died. It's a reminder of what men can do to each other."

Hersh survived and ended the war at the Theresienstadt concentration camp. From there he was eventually taken with 300 other orphans to Windermere in the Lake District and after that he settled down and re-built his life in England.

Although wrapped in the peaceful surroundings of new life in a new country the trauma of war refused to leave him and for decades afterwards he suffered from nightmares.

Yet despite the memories and his fear of Auschwitz Hersh makes regular trips to the camp, sometimes even as many as three or four times a year. Most of the time he travels with parties of schoolchildren to pass on his experiences in the hope they will learn, and that what happened to him will never happen again.

But he also travels to Auschwitz because he feels he owes it to those who did not survive.

"It's my duty to come back. I want to come back," he said standing in the shadow of the camp's barbed wire. "It is my duty to those who died and that is very important for me. I lost 81 members of my family. Cousins, relatives, sister and brothers. After the war I found out a sister had survived by escaping to Russia but she died a few years ago and now only I am left."

Hersh is unsure how many more times he will return to the camp as time marches on as that, he says "is a situation you can't change".

But until time catches up with him he will go back to Auschwitz and when he stands before the red-brick arch that bridges the railway track that once brought hundreds of thousands people to their deaths he will still recall those who were murdered.

"When I close my eyes I think of the people who died. I had many friends and all of them died: that was the end of them," he said.

The Prince of Wales, also speaking in Westminster, called the Holocaust an "evil unique in history".

"The Holocaust is not just a Jewish tragedy nor merely a dark page from the Second World War, but a warning and a lesson to all of us of all faiths at all times," he said.

The Prince finished his short speech by reading out a three-line anonymous poem scratched on to a wall by a victim of the Holocaust.

"I believe in the sun, even when it is not shining.

"I believe in love, even though I don't feel it.

"I believe in God, even when he is silent."

3. From an article on the problem of evil by the philosopher and theologian William Lane Craig:

The problem of evil,¹ is certainly the greatest obstacle to belief in the existence of God. When I ponder both the extent and depth of suffering in the world, whether due to man's inhumanity to man or to natural disasters, then I must confess that I find it hard to believe that God exists. No doubt many of you have felt the same way. Perhaps we should all become atheists.

But that's a pretty big step to take. How can we be sure that God does not exist? Perhaps there's a reason why God permits all the evil in the world. Perhaps it somehow all fits into the grand scheme of things, which we can only dimly discern, if at all. How do we know?

As a Christian theist, I'm persuaded that the problem of evil terrible as it is, does not in the end constitute a disproof of the existence of God.

We can actually prove that God and evil *are* logically consistent. You see, the atheist presupposes that God cannot have morally sufficient reasons² for permitting the evil in the world. But this assumption is not necessarily true. So long as it is even *possible* that God has morally sufficient reasons for permitting evil, it follows that God and evil are logically consistent.

[On the other hand, some people say] the extent and depth of evil in the world is so great that it's improbable that God could have morally sufficient reasons for permitting it. Therefore, given the evil in the world, it's improbable that God exists.

In response to this version of the problem of evil, I want to make two main points:

1. *We are not in a good position to assess the probability of whether God has morally sufficient reasons for the evils that occur.* As finite persons, we are limited in time, space, intelligence, and insight. But the transcendent and sovereign God sees the end from the beginning and providentially orders history so that His purposes are ultimately achieved through human free decisions. In order to achieve His ends, God may have to put up with certain evils along the way. Evils which appear pointless to us within our limited framework may be seen to have been justly permitted within God's wider framework.

2. *The Christian faith entails doctrines that increase the probability of the co-existence of God and evil.* In so doing, these doctrines decrease any improbability of God's existence thought to issue from the existence of evil. What are some of these doctrines? Let me mention three:

a. *The chief purpose of life is not happiness, but the knowledge of God.* One reason that the problem of evil seems so puzzling is that we tend to think that if God exists, then His goal for human life is happiness in this world. God's role is to provide comfortable environment for His human pets. But on the Christian view this is false. We are not God's pets, and man's end³ is not happiness in this world, but the knowledge of God, which will ultimately bring true and everlasting human fulfillment. Many evils occur in life which maybe utterly pointless with respect to the goal of producing human happiness in this world, but they may not be

¹ The word "evil" in this essay refers to all kinds of suffering and harm. Those inflicted by nature (e.g. earthquakes, illness) and those inflicted by other people (e.g. murder, assault).

² "Morally sufficient reasons" – reasons which would make it right for someone to allow a particular evil. For example, parents who hand their child over to a surgeon with a knife who cuts their child open, so that he can save the child's life have morally sufficient reasons for doing so.

³ "Man's end" = the reason for which man exists; the purpose of his life.

unjustified with respect to producing the knowledge of God. Innocent human suffering provides an occasion for deeper dependency and trust in God, either on the part of the sufferer or those around him. Of course, whether God's purpose is achieved through our suffering will depend on our response. Do we respond with anger and bitterness toward God, or do we turn to Him in faith for strength to endure?

b. *Mankind is in a state of rebellion against God and His purpose.* Rather than submit to and worship God, people rebel against God and go their own way and so find themselves alienated from God, morally guilty before Him, and groping in spiritual darkness, pursuing false gods of their own making. The terrible human evils in the world are testimony to man's depravity in this state of spiritual alienation from God. The Christian is not surprised at the human evil in the world; on the contrary, he *expects* it. The Bible says that God has given mankind over to the sin it has chosen; He does not interfere to stop it, but lets human depravity run its course. This only serves to heighten mankind's moral responsibility before God, as well as our wickedness and our need of forgiveness and moral cleansing.

c. *The knowledge of God spills over into eternal life.* In the Christian view, this life is not all there is. Jesus promised eternal life to all who place their trust in him as their Savior and Lord. In the afterlife God will reward those who have borne their suffering in courage and trust with an eternal life of unspeakable joy. The apostle Paul, who wrote much of the New Testament, lived a life of incredible suffering. Yet he wrote, "We do not lose heart. For this slight, momentary affliction is preparing us for an eternal weight of glory beyond all comparison, because we look not to the things that are seen, but to the things that are unseen, for the things that are seen are transient, but the things that are unseen are eternal" (II Cor. 4:16-18). Paul imagines a scale, as it were, in which all the sufferings of this life are placed on one side, while on the other side is placed the glory that God will bestow on his children in heaven. The weight of glory is so great that it is literally beyond comparison with the suffering. Moreover, the longer we spend in eternity the more the sufferings of this life shrink toward an infinitesimal moment. That's why Paul could call them "a slight and momentary affliction"—they were simply overwhelmed by the ocean of divine eternity and joy which God lavishes on those who trust Him.

d. *The knowledge of God is an incommensurable⁴ good.* To know God, the source of infinite goodness and love, is an incomparable good, the fulfillment of human existence. The sufferings of this life cannot even be compared to it. Thus, the person who knows God, no matter what he suffers, no matter how awful his pain, can still say, "God is good to me," simply by virtue of the fact that he knows God, an incomparable good.

These four Christian doctrines greatly reduce any improbability which evil would seem to throw on the existence of God.

1. *'The existence of evil in the world proves that God does not exist'* Discuss.

⁴"Incommensurable": impossible to compare, because it is so great.



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ENTRANCE SCHOLARSHIPS EXAMINATION 2015

PHYSICS

30 Minutes

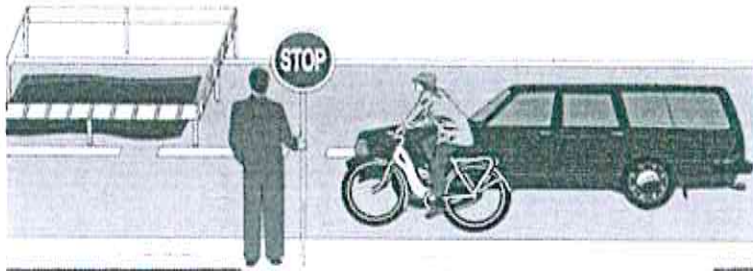
GENERAL INSTRUCTIONS:

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

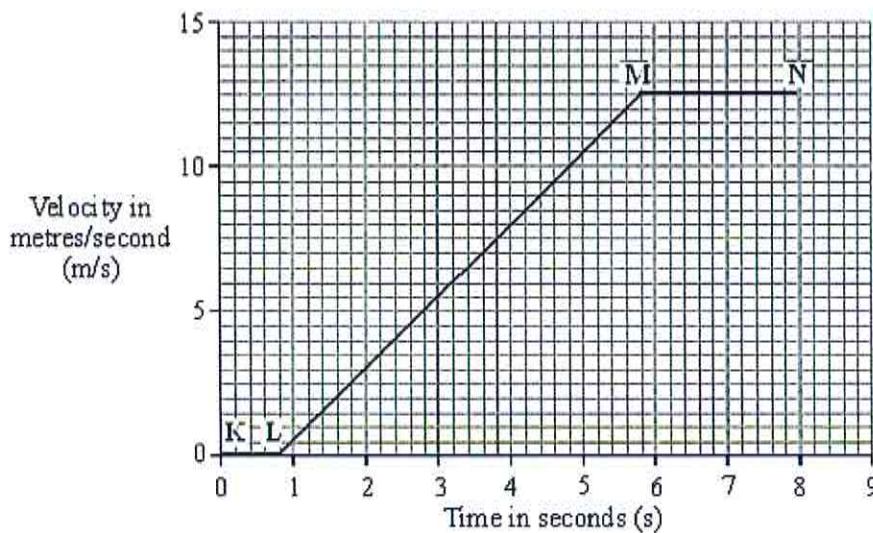
You may use a calculator if you wish

Q1.

A car and a bicycle are travelling along a straight road. They have stopped at road works.



The graph shows how the velocity of the car changes after the sign is changed to GO.



- (a) Between which two points on the graph is the car moving at constant velocity?

.....

(1)

- (b) Between which two points on the graph is the car accelerating?

.....

(1)

- (c) Between the sign changing to GO and the car starting to move, there is a time delay. This is called the reaction time.

- (i) What is the reaction time of the car driver?

Reaction time = seconds

(1)

- (ii) Which **one** of the following could increase the reaction time of a car driver?
Tick the box next to your choice.

- Drinking alcohol
- Wet roads
- Worn car brakes

(1)

- (d) The cyclist starts to move at the same time as the car. For the first 2 seconds the cyclist's acceleration is constant and is greater than that of the car.

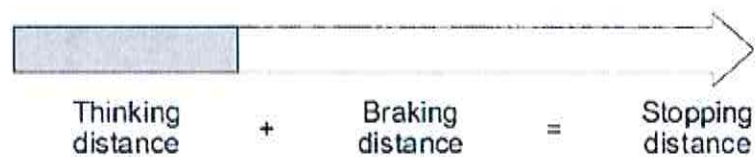
Draw a line on the graph to show how the velocity of the cyclist might change during the first 2 seconds of its motion.

(2)

(Total 6 marks)

Q2.

The diagram shows how the thinking distance and braking distance of a car add together to give the stopping distance of the car.



- (a) Use words from the box to complete the sentence.

distance	energy	force	time
----------	--------	-------	------

The stopping distance is found by adding the distance the car travels during the driver's reaction and the distance the car travels under the braking

(2)

(b) Which **one** of the following would **not** increase the thinking distance?

Tick (✓) **one** box.

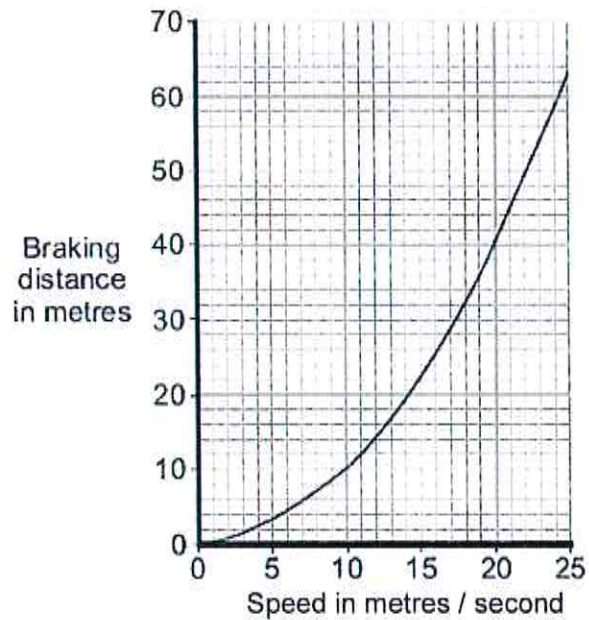
The car driver being tired.

The car tyres being badly worn.

The car being driven faster.

(1)

(c) The graph shows how the braking distance of a car changes with the speed of the car.
The force applied to the car brakes does not change.



(i) What conclusion about braking distance can be made from the graph?

.....

.....

.....

.....

(2)

- (ii) The graph is for a car driven on a dry road.

Draw a line on the graph to show what is likely to happen to the braking distance at different speeds if the same car was driven on an icy road.

(1)

- (d) A local council has reduced the speed limit from 30 miles per hour to 20 miles per hour on a few roads. The reason for reducing the speed limit was to reduce the number of accidents.

- (i) A local newspaper reported that a councillor said:

"It will be much safer because drivers can react much faster when driving at 20 miles per hour than when driving at 30 miles per hour."

This statement is wrong. Why?

.....

(1)

- (ii) The local council must decide whether to introduce the lower speed limit on a lot more roads.

What evidence should the local council collect to help make this decision?

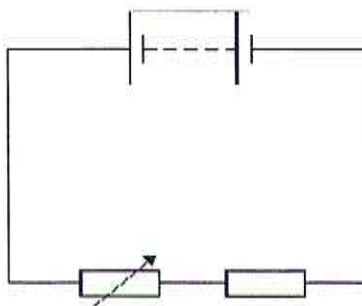
.....

(2)

(Total 9 marks)

Q3.

- (a) The diagram shows a simple circuit. Add an ammeter and a voltmeter to the circuit to show how to measure the current through the fixed resistor and the voltage across it.

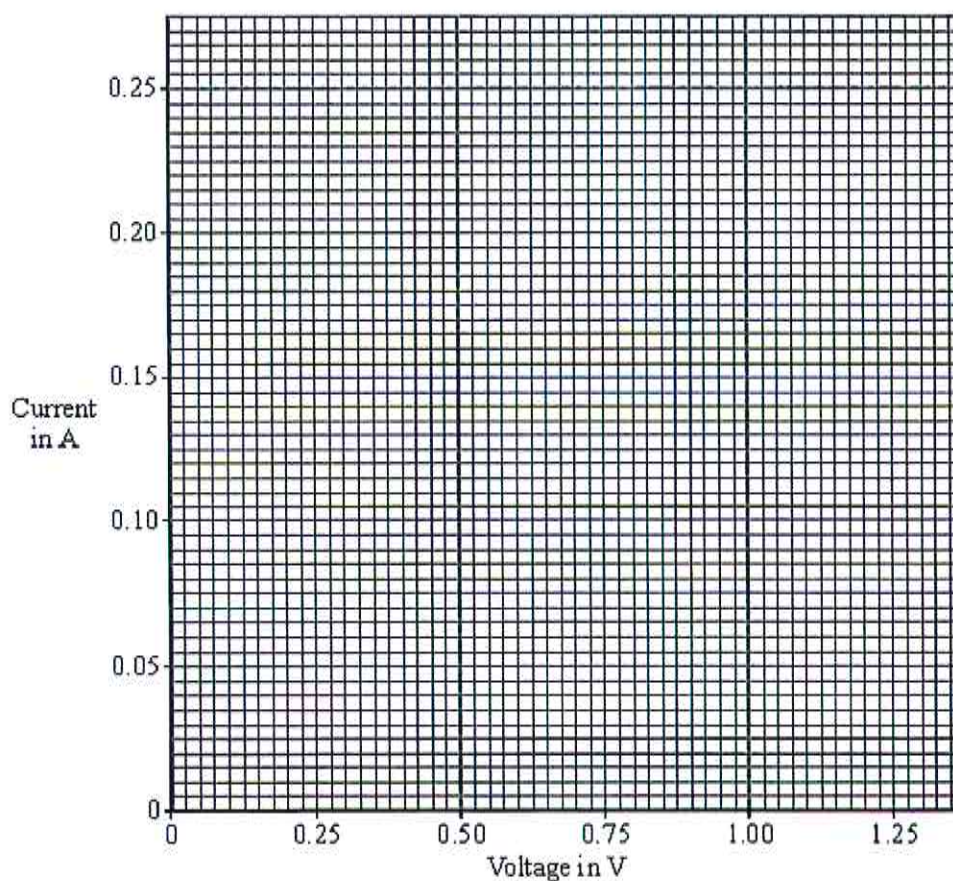


(2)

(b) An experiment using a circuit like the one above was set up. The following results were obtained when the resistance of the variable resistor was decreased.

(i) Draw a graph of the results below.

Voltage across fixed resistor in volts	Current in amps
0.50	0.10
0.75	0.15
1.00	0.20
1.25	0.25



(2)

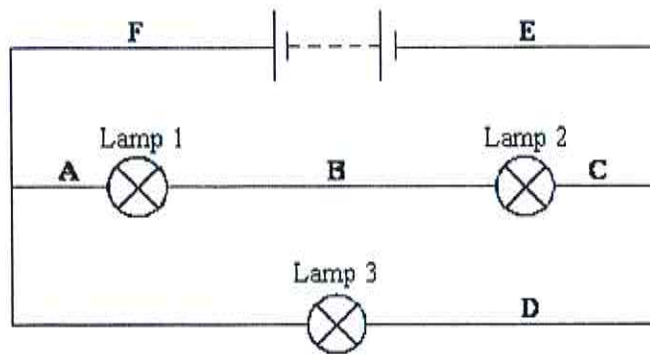
(ii) Use the graph to find the voltage when the current is 0.05 A.

Voltage = V

(1)

(Total 5 marks)

Q4. The circuit contains three identical lamps.



(a) Complete each of the sentences about the circuit, using one of the phrases in the box.

more than less than the same as

(i) The current at **A** is the current at **B**. (1)

(ii) The current at **A** is the current at **D**. (1)

(iii) The current at **F** is the current at **E**. (1)

(iv) The current at **F** is the current at **D**. (1)

(b) In the circuit, which lamp is brightest?.....

Give a reason for your answer.

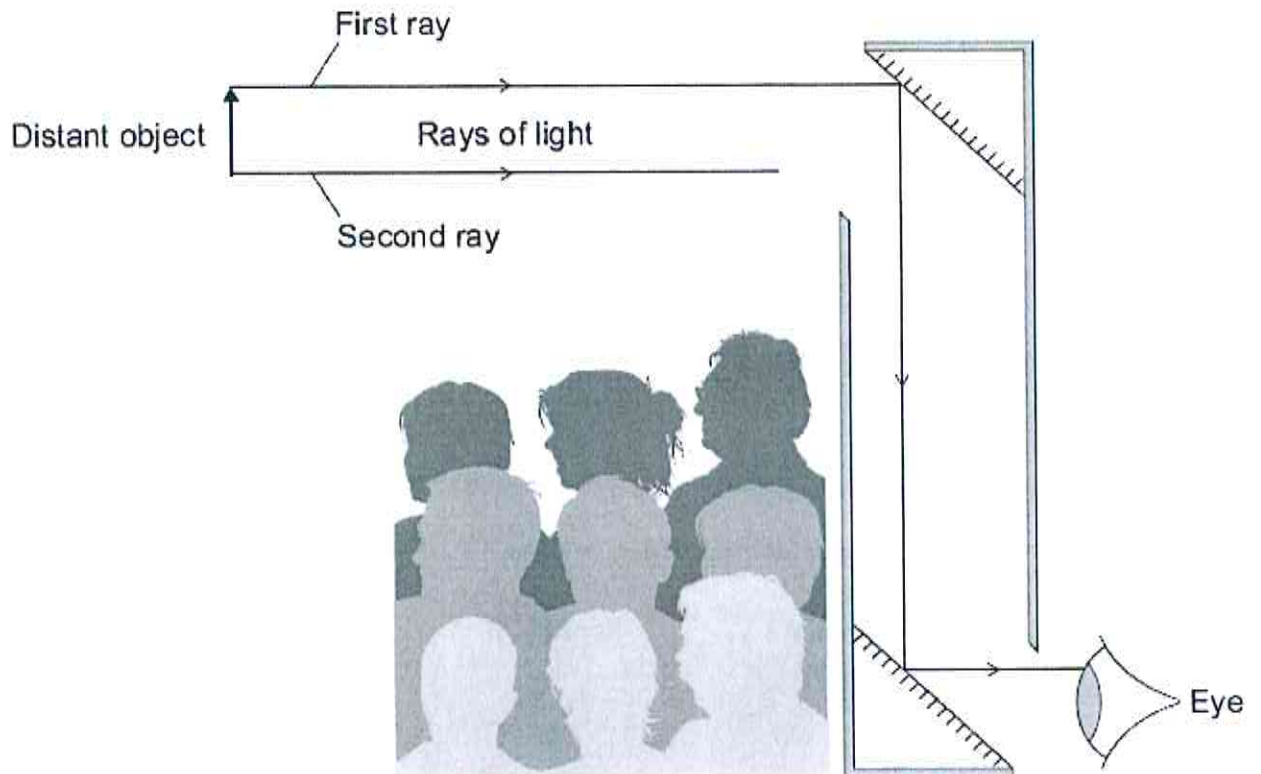
.....

(2)
(Total 6 marks)

Q5.

The diagram shows a periscope being used to see over the heads of a crowd of people.

The periscope has been made using two plane mirrors.



- (a) Using a ruler, complete the diagram to show how the second ray of light from a distant object reaches the person's eye.

(2)

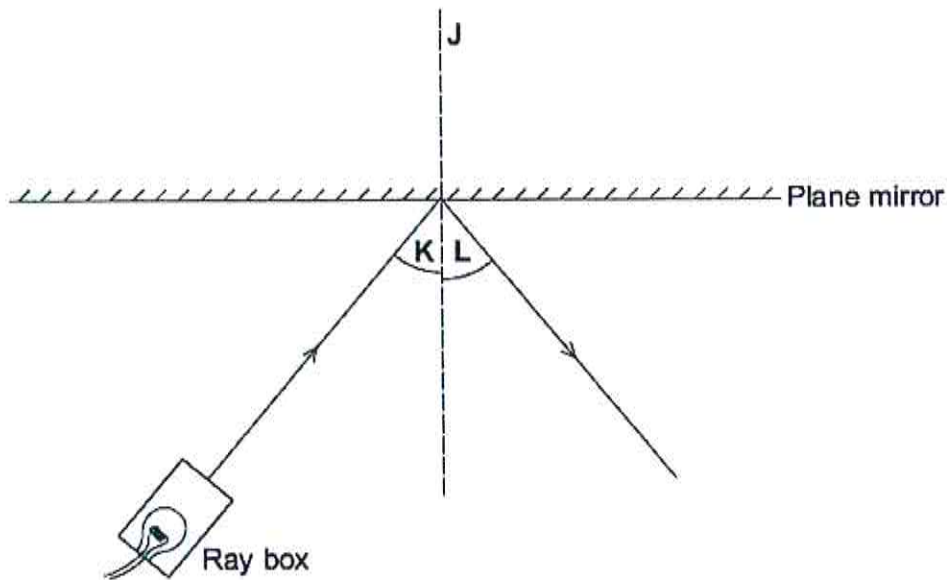
- (b) How big is the image produced by the periscope compared to the size of the object?

.....

(1)

(Total 3 marks)

Q6. The diagram shows a ray of light from a ray box that is reflected by a plane mirror.



(a) What name is given to the dashed line labelled J?

Draw a ring around the correct answer.

incident normal reflection

(1)

(b) Draw a ring around the correct answer in the box to complete the sentence.

If the angle marked K is halved, then the angle marked L will

be doubled.
not change.
be halved.

(1)

(c) A student looking into the mirror can see an image of the ray box.

Which **two** words can be used to describe the image that the student sees?

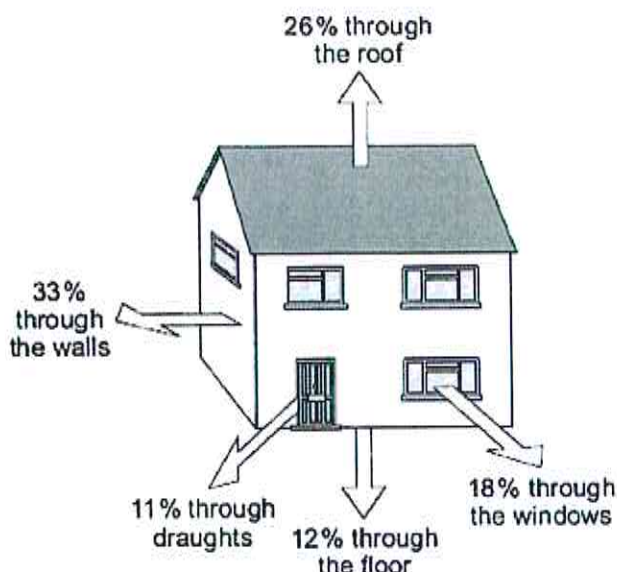
Draw a ring around the **two** correct answers.

inverted magnified real upright virtual

(2)
(Total 4 marks)

Q7.

The diagram shows where heat is lost from a house that is **not** insulated.



- (a) (i) Through which part of the house is most heat lost?

.....

(1)

- (ii) How can the heat loss through the windows be reduced?

.....

.....

(1)

- (b) A homeowner wants to reduce her energy bills and make her home more energy efficient. The table shows five ways this could be done. The table also shows how much money each way would save the homeowner each year.

	Cost	Money saved each year
Installing loft insulation	£175	£60
Fitting draught-proofing	£45	£20
Installing cavity wall insulation	£300	£80
Adding a hot water tank jacket	£15	£20
Using energy efficient light bulbs	£60	£30

- (i) Which **one** of the five ways of reducing energy bills would reduce the yearly energy bill the most?

.....

(1)

- (ii) This year the homeowner has only got £60 to spend to improve the energy efficiency of her home.

Use the information in the table to explain what the homeowner should spend this money on.

.....

.....

.....

.....

(2)

(Total 5 marks)



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ENTRANCE SCHOLARSHIPS EXAMINATION 2015

Spanish

1 Hour

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)