edexcel INTERNATIONAL

IGCSE

London Examinations IGCSE

Physics (4420)

First examination May 2005

September 2003, Issue 1

delivered locally, recognised globally

Specimen Papers and Mark Schemes

London Examinations IGCSE

Physics (4420)

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel International centres receive the support they need to help them deliver their education and training programmes to learners.

For further information please call our International Customer Relations Unit

Tel +44 (0) 190 884 7750

international@edexcel.org.uk

www.edexcel-international.org

Authorised by Elizabeth Blount

Publications Code: UG013059

Contents

Specimen Papers

Mark Schemes

Centre No.						Paper Reference						Surname	Initial(s)
Candidate No.						4	4	2	0	/	1	F	Signature

Paper Reference(s)

4420/1F

Examiner's use only

Team Leader's use only

London Examinations IGCSE

Physics

Paper 1F

Foundation Tier

Specimen Paper

Time: 1 hour 30 minutes

Materials required for examination
Nil

Items included with question papers
Nil

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
Total	

Instructions to Candidates

In the boxes above, write your centre number and candidate number, your surname, initial(s) and signature.
The paper reference is shown at the top of this page. Check that you have the correct question paper.
Answer **ALL** the questions in the spaces provided in this question paper.
Show all the steps in any calculations and state the units.
Calculators may be used.

Information for Candidates

There are 24 pages in this question paper. All blank pages are indicated.
The total mark for this paper is 100. The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

Advice to Candidates

You are reminded of the importance of clear English and careful presentation in your answers.

Printer's Log. No.
MP68700A

M P 6 8 7 0 0 A

W850/4420/57570 1/1/2/

Turn over

London Examinations
from Edexcel International

FORMULAE

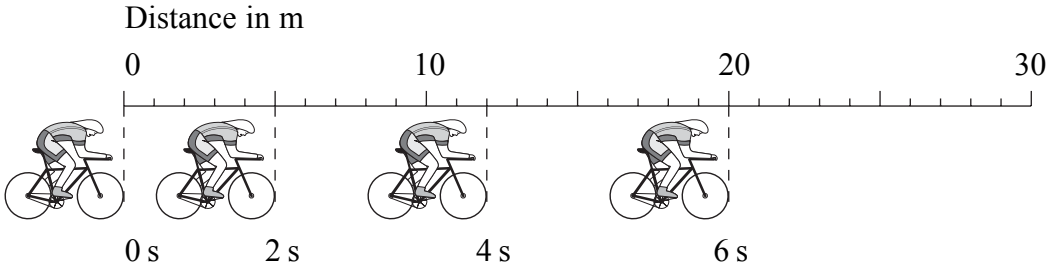
You may find the following formulae useful.

$$\text{power} = \frac{\text{work done}}{\text{time taken}} \qquad P = \frac{W}{t}$$

$$\text{frequency} = \frac{1}{\text{time period}} \qquad f = \frac{1}{T}$$

1. A cyclist sets off from a standing start.
Photographs are taken of the cyclist at 2 s intervals.
The diagram shows the results.

Leave blank



(a) How far does the cyclist travel in the first 4 s?

.....

(1)

(b) What happens to the cyclist's speed during the 6 s shown?
Explain how you can tell.

.....

.....

(2)

(c) After 6 s the cyclist slows down.
Mark the scale with an **X** to show a possible position of the cyclist's front wheel when the next photograph is taken.

(1)

Q1

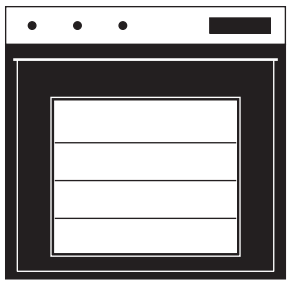
(Total 4 marks)

Turn over

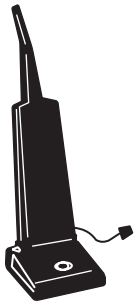
2. (a) The diagrams shows some appliances used in a home.

Leave blank

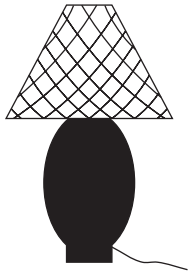
Torch



Gas oven



Vacuum cleaner



Lamp

(i) Which **two** use electricity to mainly produce light?

..... and .....

(1)

(ii) Which **one** uses electricity to produce movement?

.....

(1)

(iii) Which **two** depend on the mains electricity supply?

..... and .....

(1)

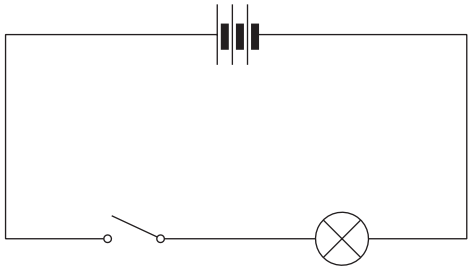
(iv) Which **one** normally works from a direct current supply?

.....

(1)

(b) The diagram shows the circuit used by the torch.

Leave blank



(i) How many cells are fitted to the torch?

.....

(1)

(ii) A voltmeter is used to check the voltage across the battery.
Draw the symbol for a voltmeter in the correct position on the diagram.

(2)

(iii) If one cell was removed from the battery what would happen to the brightness of the torch bulb?

.....

(1)

Q2

(Total 8 marks)

Turn over

3. (a) Use words from the box to complete the passage below.

Leave blank

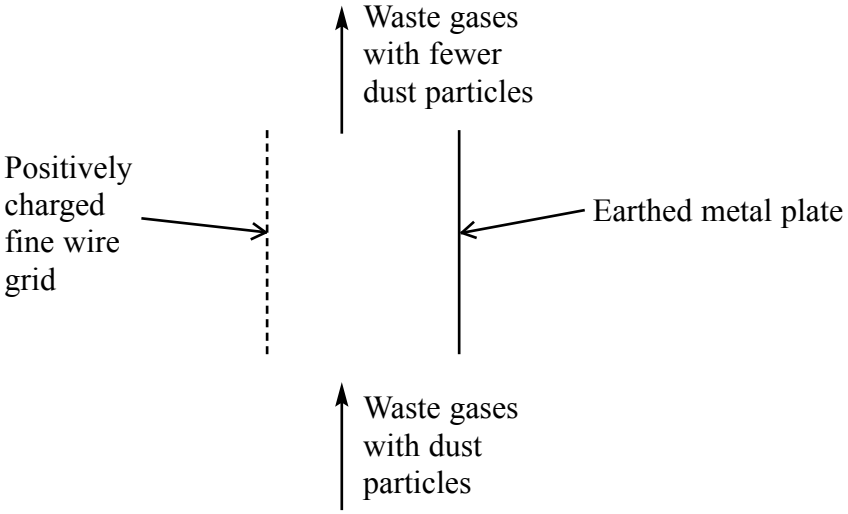
attract	**electrons**	**electrostatic**	**friction**	**protons**	**repel**

When Jacquie takes off her woollen jumper she hears a crackling sound and sees small flashes of light. It is thought that the ..... between her jumper and blouse is producing ..... charges. The jumper becomes positively charged because ..... are being removed from it. Because the jumper and blouse have opposite charges they ..... each other and this makes it difficult for the jumper to be removed.

(4)

(b) The diagram shows the inside of an electrostatic precipitator. This is a device for removing dust from waste gases.
As the dust particles move up past the positively charged fine wire grid they gain a positive charge.

Leave blank



(i) Show with an arrow, the direction of movement of the positively charged dust particles between the wire grid and the earthed metal plate.

(1)

(ii) Explain why the positively charged dust particles move in the direction you have shown.

.....

.....

.....

(2)

(iii) From time to time the earthed metal plate is hit with a hammer.

Suggest a reason for this.

.....

.....

(1)

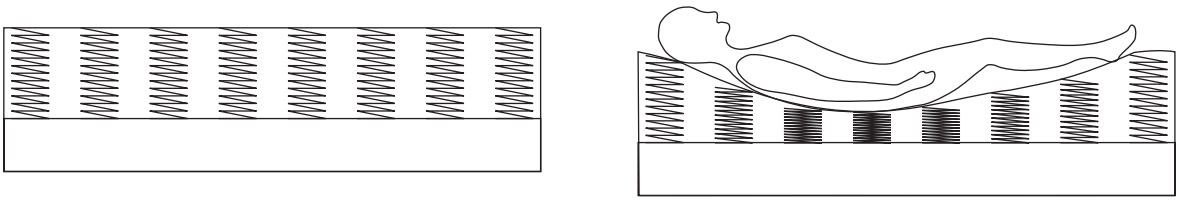
Q3

(Total 8 marks)

Turn over

4. The mattress of a bed contains identical springs. The diagrams show the changes that take place when a person lies on the bed.

Leave blank



(a) (i) How do the springs change when a person lies on the bed?

.....

(1)

(ii) Circle the spring that has the greatest force on it.

(1)

(iii) How can you tell that this spring has the greatest force acting on it?

.....

(1)

(b) A manufacturer makes a mattress that sags less in the middle when a person lies on it.

Suggest **two** ways of doing this.

1 .....

.....

2 .....

.....

(2)

(c) One force acting on the person is the upward push of the springs.

(i) A second force acts on the person.

Draw an arrow on the diagram to show the direction of this force.

(1)

(ii) Use words from the box to complete the sentence.

downward	**Earth**	**mattress**	**upward**

The second force on the person is the ..... pull of the ..... .

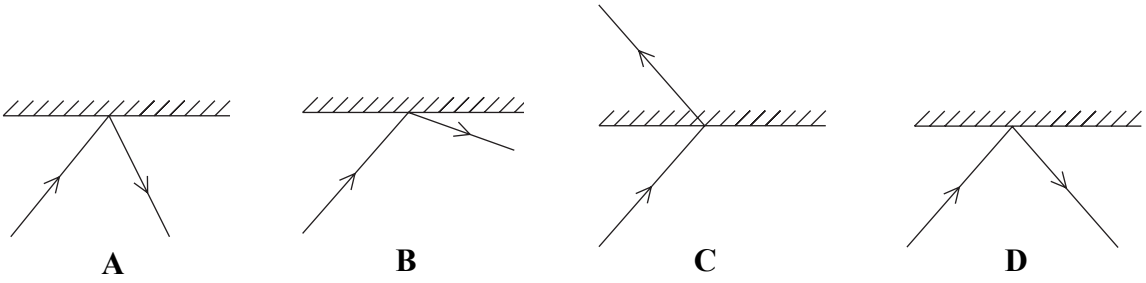
(2)

Q4

(Total 8 marks)

5. (a) Which diagram shows the reflection of a ray of light at a mirror correctly?

Leave blank



Write the correct answer (**A**, **B**, **C** or **D**) in the box.

(1)

(b) A person looking into a mirror sees an image.

(i) Write an **I** on the diagram to show the position of the image of the person's nose.

(2)

(ii) Circle **three** words or phrases from the list that describe the image.

magnified
same size as the object
smaller than the object

upside down
upright

real
virtual

(3)

Q5

(Total 6 marks)

Turn over

6. (a) The table shows the power rating and operating current for a number of household electrical appliances.

Leave blank

Appliance	Power (watt)	Current (ampere)
Cooker	6000	25.0
Iron	960	4.0
Food mixer	480	2.0
Television	180	0.75
Table lamp	60	0.25

(i) Which appliance costs most to run for an hour?

Give a reason for your answer.

Appliance .....

Reason .....

.....

(2)

(ii) You are provided with the following fuses

1A 3A 5A

Which fuse can be used with the iron? Explain your answer.

.....

.....

.....

(2)

(b) Electrical lighting in a house uses parallel circuits instead of series circuits.

Leave blank

State **two** reasons why parallel circuits are used for domestic lighting circuits.

1 .....

.....

2 .....

..... **Q6**

(2)

(Total 6 marks)

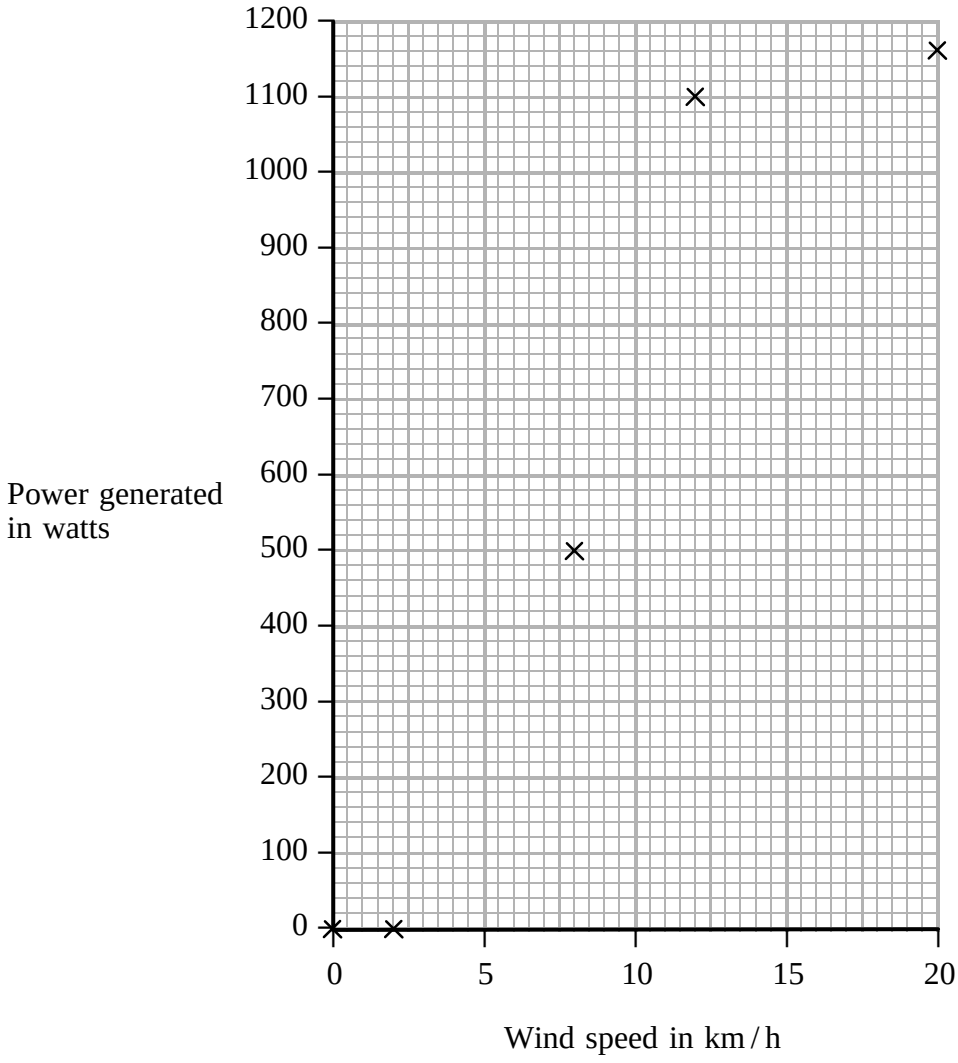
Turn over

Leave blank

7. (a) A wind-powered generator is used to produce electrical power when the wind is blowing. The table shows the electrical power generated by the wind for different wind speeds.

Power generated (watts)	0	0	140	500	900	1100	1160	1160
Wind speed (km/h)	0	2	5	8	10	12	15	20

(i) On to the axes below, plot the points at wind speeds of 5, 10 and 15 km/h. Draw a



smooth curve through the points.

(3)

(ii) What is the lowest wind speed needed to generate power?

Leave blank

.....

(1)

(iii) What is the maximum power generated by the wind?

.....

(1)

(iv) State **one** disadvantage of using only a wind-powered generator as the source of electrical power.

.....

.....

(1)

(b) Complete the sentence to show the energy transfer taking place in the wind-powered generator.

..... energy is transferred to ..... energy.

(2)

Q7

(Total 8 marks)

Turn over

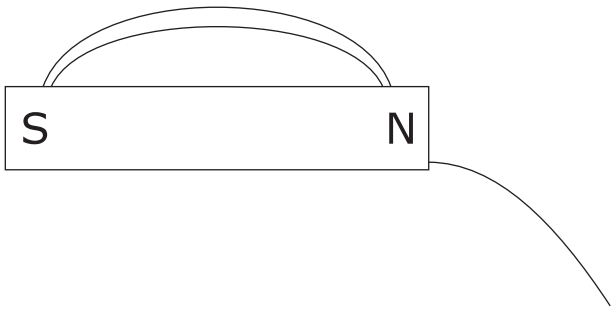
8. (a) The diagram shows two magnets that are attracting each other.

Leave blank

Label the poles on the right-hand magnet.

(1)

(b) The diagram shows part of the magnetic field of a magnet.



(i) Draw an arrow on **one** line to show the direction of the magnetic field.

(1)

(ii) Draw **one** more line of the magnetic field pattern.

(1)

(iii) Complete each row of the table.

Material	Attracted to magnet? (Yes or No)
Brass	
Iron	
Plastic	

(2)

Q8

(Total 5 marks)

9. (a) A current of 0.02 A could give a serious electrical shock to a person. If the resistance of a body is 10 000 ohms, calculate the voltage which will cause this current.

Leave blank

.....

.....

.....

(3)

(b) Explain why it is dangerous to operate a light switch with a wet hand.

.....

.....

(2)

(c) Explain how the earth wire and fuse prevent a person receiving an electric shock when the live wire comes into contact with the metal casing of an appliance.

.....

.....

(2)

Q9

(Total 7 marks)

Turn over

10. A radio station uses both long and short radio waves for broadcasting information.

Leave blank

Radio wave	Wavelength (m)	Frequency (kHz)
Long wave	1500	200
Short wave	25	12 000

1 kHz = 1000 Hz

(a) Calculate the speed of the long wave.

.....

.....

.....

(3)

(b) Which statement about the speeds of the radio waves is correct?

A The long wave travels faster than the short wave.

B The short wave travels faster than the long wave.

C Both radio waves travel at the same speed.

Write the correct answer (**A**, **B** or **C**) in the box. ☐

(1)

Q10

(Total 4 marks)

11. The diagram shows the electromagnetic spectrum.

Leave blank

Gamma rays	X-rays	Ultra-violet	Visible		Micro-waves	Radio waves

(a) Write the name of the missing radiation on the diagram.

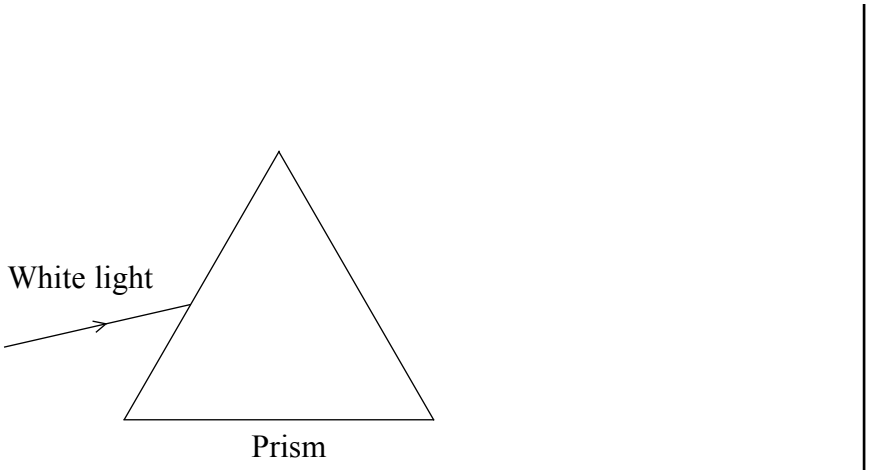
(1)

(b) Name **one** use for this radiation.

.....

(1)

(c) A visible spectrum is produced using a prism. Complete the labelled diagram below by showing the paths of the red and blue light to show how this happens.



(3)

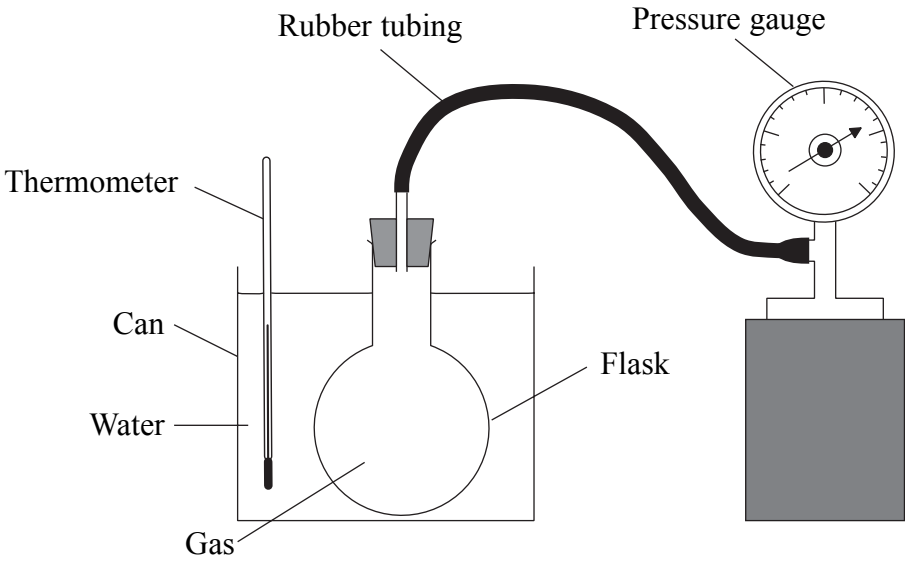
Q11

(Total 5 marks)

Turn over

12. The diagram shows the apparatus used to investigate how the pressure of a gas changes with temperature. As the water surrounding the gas is heated, the pressure of the gas is measured using the pressure gauge.

Leave blank



(a) Explain how the gas exerts pressure.

.....

.....

(2)

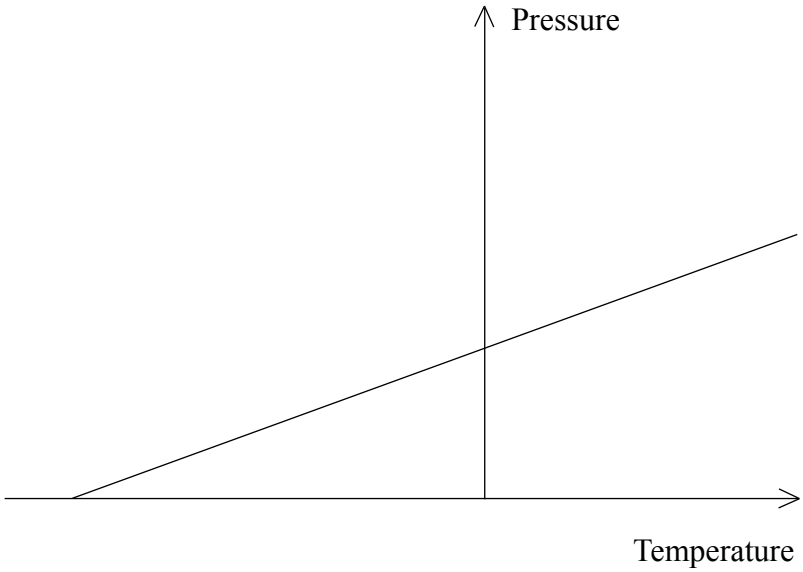
(b) Complete the table to show what happens to the gas in the flask as the temperature is increased. Use the words **increases**, **decreases**, or **stays the same**.

	Increases, decreases, or stays the same
Speed of gas particles	
Pressure in the flask	
Mass of particles	
Volume of gas	

(4)

(c) A sketch graph of the results of the experiment is shown.

Leave blank



(i) What does the graph show about the way in which the pressure of the gas changes with increasing temperature?

.....

(1)

(ii) Write an **X** on the horizontal axis to show where the temperature is absolute zero.

(1)

(iii) What is the speed of the gas particles at this temperature?

.....

(1)

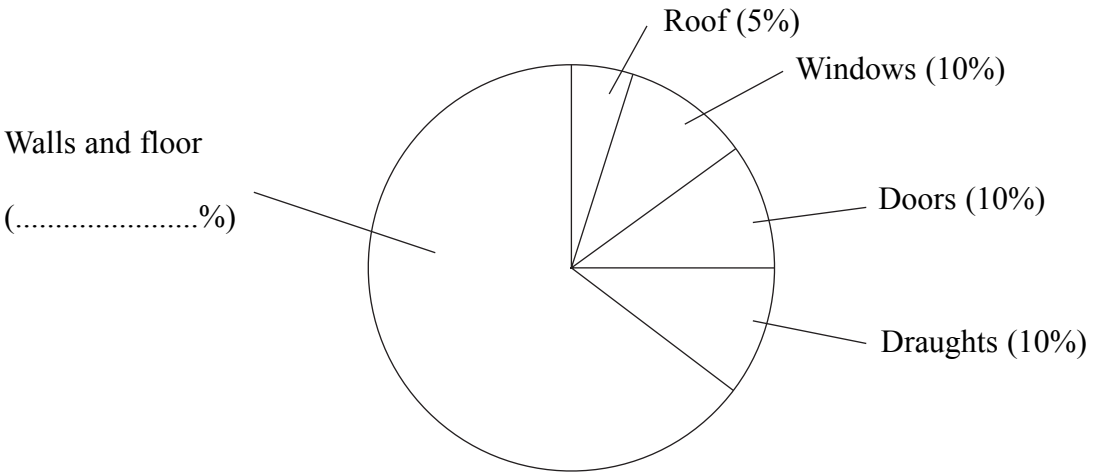
Q12

(Total 9 marks)

Turn over

13. (a) The main heat energy losses from a house in a cold climate are shown in the diagram.

Leave blank



(i) Complete the diagram to show the percentage heat energy loss through the walls and floor.

(1)

(ii) Complete the table below to show how the heat energy loss from each part of the house can be reduced. The first one has been done for you.

Part of the house	Method used for reducing heat energy loss
Roof	Glass-fibre insulation in the loft
Doors	....
Floor	....

(2)

(b) Double glazing is used to reduce the heat loss from houses through the windows. The table compares the heat loss for ordinary windows and for double-glazed windows.

Leave blank

Type of window	Heat loss (joules per second)
Ordinary window	224
Double-glazed window	116

The size of the windows and the temperature inside and outside the house are the same in each case.

(i) How many joules per second does using double glazing save?

.....

(1)

(ii) What is the heat loss through an ordinary window in one hour?

.....

.....

.....

(3)

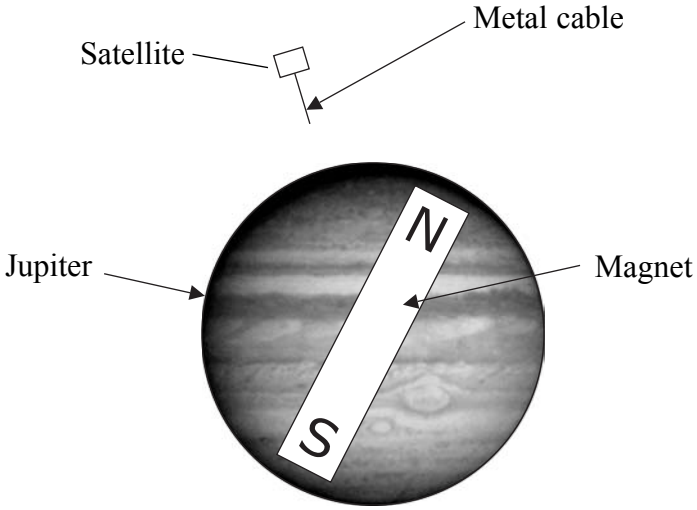
Q13

(Total 7 marks)

Turn over

14. The magnetic field of the planet Jupiter is similar to that of a large permanent magnet placed inside the planet as shown below.

Leave blank



A satellite with a long metal cable hanging from it could generate electrical energy as it moves through the magnetic field of Jupiter.

(a) State the effect that produces the electrical energy.

.....

(1)

(b) State and explain what happens to the size of the voltage induced in the metal cable if the satellite moves faster.

.....

.....

.....

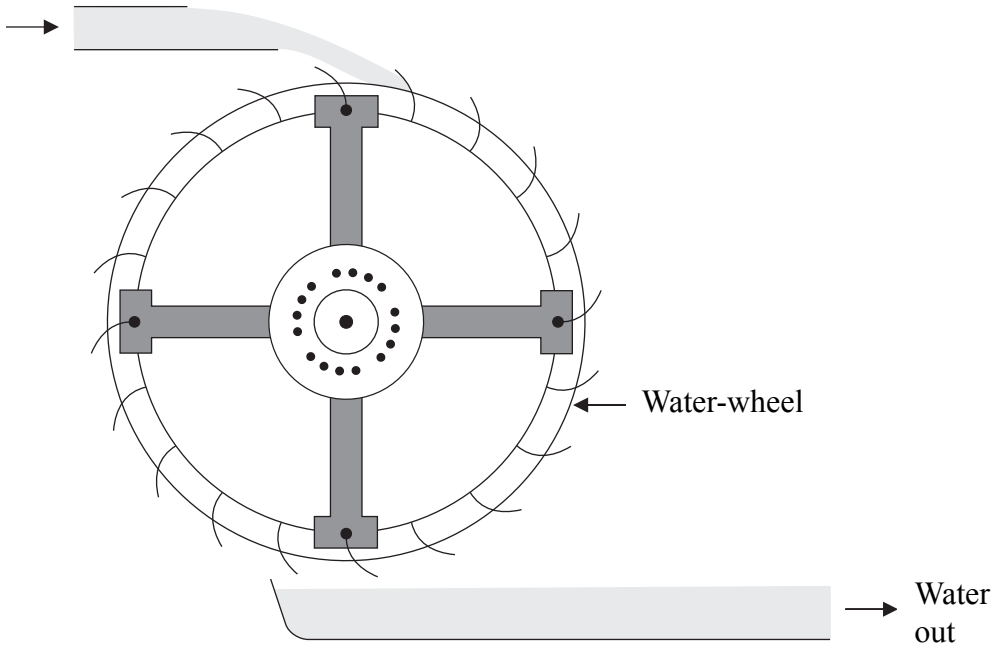
(3)

(Total 4 marks)

Q14

15. Water flows onto a water-wheel as shown in the diagram. The wheel is turned when the water strikes the blades. This is used to run a generator, which produces an electric current.

Leave blank



(a) State **two** main energy changes that take place during this process to produce electricity.

1 .....

2 .....

(2)

(b) The power delivered by the water is 2000 W. The electrical power produced is 1400 W. Calculate the overall efficiency of the process.

.....

.....

.....

(2)

(c) Suggest **two** reasons why the process is not 100% efficient.

1 .....

2 .....

(2)

Q15

(Total 6 marks)

Turn over

Leave blank

16. (a) The atoms $^{14}_{7}N$ and $^{15}_{7}N$ are isotopes of nitrogen.

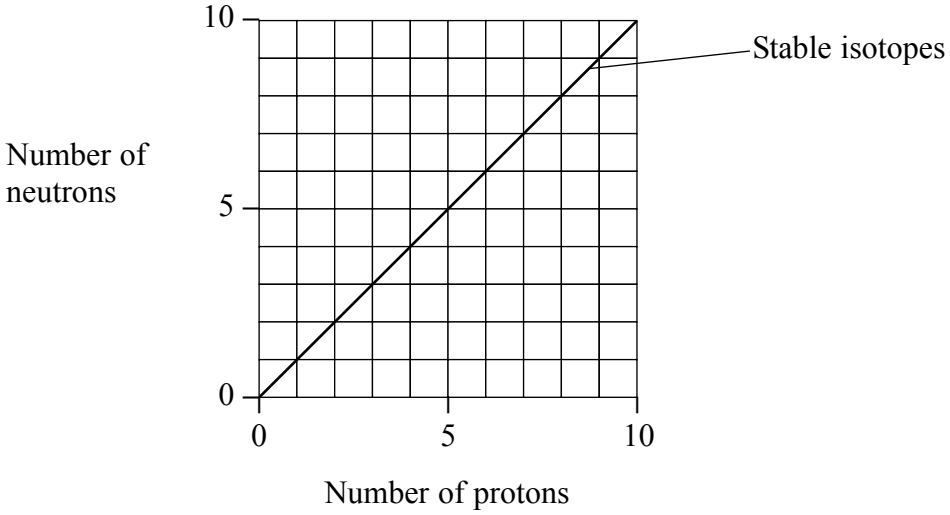
Write down **one** similarity and **one** difference between the nuclei of these isotopes.

similarity .....

difference .....

(2)

(b) The graph shows the relationship between the number of neutrons and the number of protons in some stable nuclei.



(i) What is the relationship between the number of protons and the number of neutrons for these stable nuclei?

.....

(1)

(ii) Use an **X** to mark the position of $^{15}_{7}N$ on the graph.

(1)

(iii) What does this tell you about $^{15}_{7}N$?

.....

(1)

Q16

(Total 5 marks)

TOTAL FOR PAPER: 100 MARKS

END

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						4	4	2	0	/	2	H	Signature	

Paper Reference(s)

4420/2H

London Examinations IGCSE

Physics

Paper 2H

Higher Tier

Specimen Paper

Time: 2 hours

Examiner's use only

Team Leader's use only

Materials required for examination
Nil

Items included with question papers
Nil

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
Total	

Instructions to Candidates

In the boxes above, write your centre number and candidate number, your surname, initial(s) and signature.
The paper reference is shown at the top of this page. Check that you have the correct question paper.
Answer **ALL** the questions in the spaces provided in this question paper.
Show all the steps in any calculations and state the units.
Calculators may be used.

Information for Candidates

There are 28 pages in this question paper. All blank pages are indicated.
The total mark for this paper is 120. The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

Advice to Candidates

You are reminded of the importance of clear English and careful presentation in your answers.

Printer's Log. No.
MP68700A

M P 6 8 7 0 0 A

W850/4420/57570 1/1/2/

Turn over

London Examinations
from Edexcel International

FORMULAE

You may find the following formulae useful.

energy transferred = current × voltage × time $E = I \times V \times t$

pressure × volume = constant $p_1 \times V_1 = p_2 \times V_2$

$$\frac{\text{pressure}}{\text{kelvin temperature}} = \text{constant} \qquad \frac{p_1}{T_1} = \frac{p_2}{T_2}$$

$$\text{frequency} = \frac{1}{\text{time period}} \qquad f = \frac{1}{T}$$

$$\text{power} = \frac{\text{work done}}{\text{time taken}} \qquad P = \frac{W}{t}$$

1. (a) A current of 0.02 A could give a serious electrical shock to a person. If the resistance of a body is 10 000 ohms, calculate the voltage which will cause this current.

Leave blank

.....

.....

.....

(3)

(b) Explain why it is dangerous to operate a light switch with a wet hand.

.....

.....

(2)

(c) Explain how the earth wire and fuse prevent a person receiving an electric shock when the live wire comes into contact with the metal casing of an appliance.

.....

.....

(2)

Q1

(Total 7 marks)

Turn over

2. A radio station uses both long and short radio waves for broadcasting information.

Leave blank

Radio wave	Wavelength (m)	Frequency (kHz)
Long wave	1500	200
Short wave	25	12 000

1 kHz = 1000 Hz

(a) Calculate the speed of the long wave.

.....

.....

.....

(3)

(b) Which statement about the speeds of the radio waves is correct?

A The long wave travels faster than the short wave.

B The short wave travels faster than the long wave.

C Both radio waves travel at the same speed.

Write the correct answer (**A**, **B** or **C**) in the box. ☐

(1)

Q2

(Total 4 marks)

3. The diagram shows the electromagnetic spectrum.

Leave blank

Gamma rays	X-rays	Ultra-violet	Visible		Micro-waves	Radio waves

(a) Write the name of the missing radiation on the diagram.

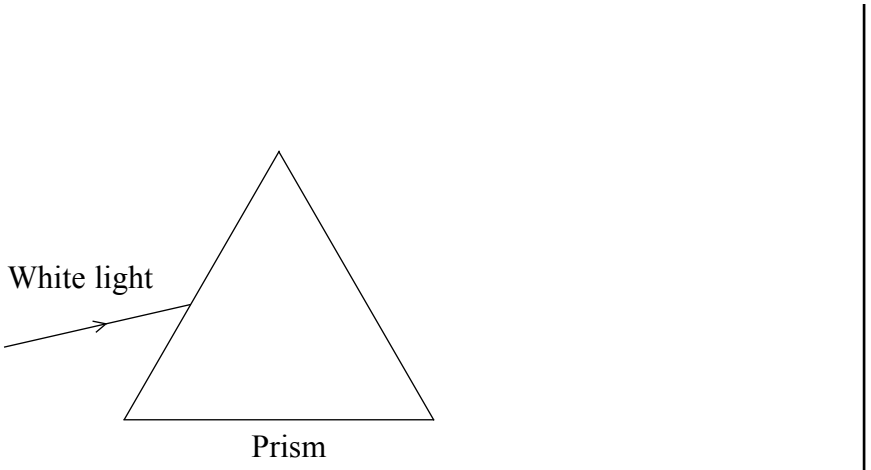
(1)

(b) Name **one** use for this radiation.

.....

(1)

(c) A visible spectrum is produced using a prism. Complete the labelled diagram below by showing the paths of the red and blue light to show how this happens.



(3)

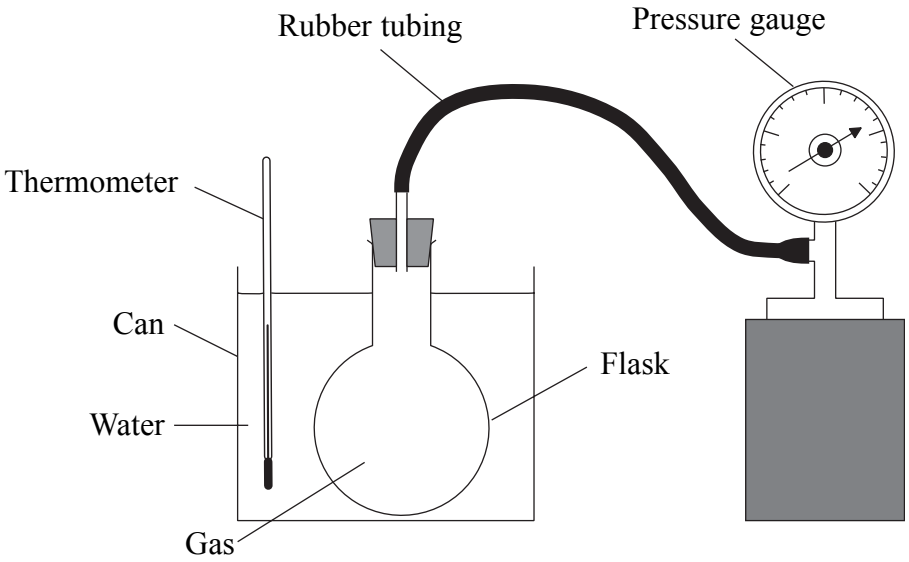
Q3

(Total 5 marks)

Turn over

4. The diagram shows the apparatus used to investigate how the pressure of a gas changes with temperature. As the water surrounding the gas is heated the pressure of the gas is measured using the pressure gauge.

Leave blank



(a) Explain how the gas exerts pressure.

.....

.....

(2)

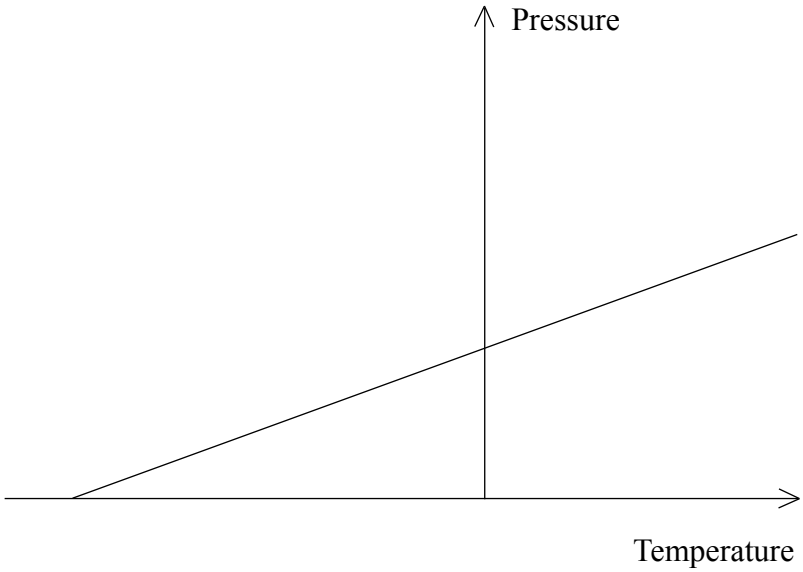
(b) Complete the table to show what happens to the gas in the flask as the temperature is increased. Use the words **increases**, **decreases**, or **stays the same**.

	Increases, decreases, or stays the same
Speed of gas particles	
Pressure in the flask	
Mass of particles	
Volume of gas	

(4)

(c) A sketch graph of the results of the experiment is shown.

Leave blank



(i) What does the graph show about the way in which the pressure of the gas changes with increasing temperature?

.....

(1)

(ii) Write an **X** on the horizontal axis to show where the temperature is absolute zero.

(1)

(iii) What is the speed of the gas particles at this temperature?

.....

(1)

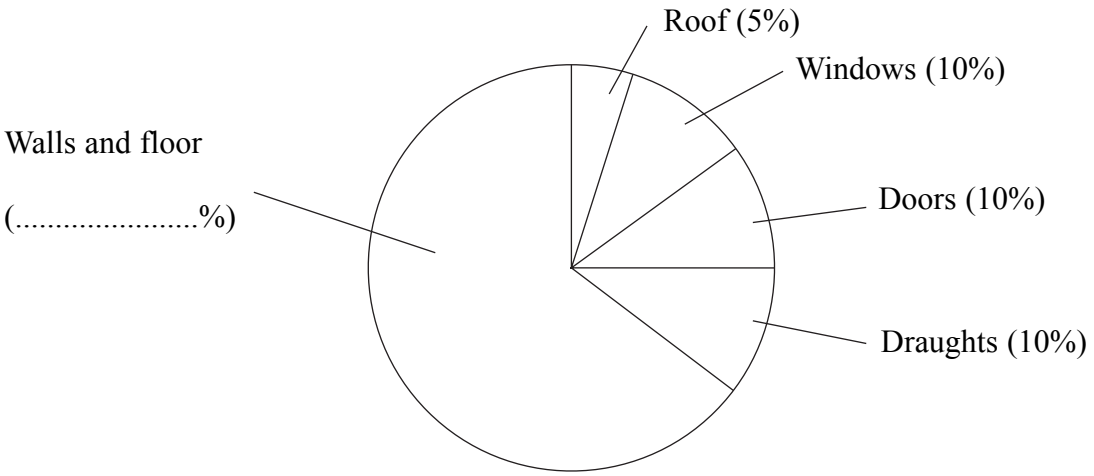
Q4

(Total 9 marks)

Turn over

5. (a) The main heat energy losses from a house in a cold climate are shown in the diagram.

Leave blank



(i) Complete the diagram to show the percentage heat energy loss through the walls and floor.

(1)

(ii) Complete the table below to show how the heat energy loss from each part of the house can be reduced. The first one has been done for you.

Part of the house	Method used for reducing heat energy loss
Roof	Glass-fibre insulation in the loft
Doors	....
Floor	....

(2)

(b) Double glazing is used to reduce the heat loss from houses through the windows. The table compares the heat loss for ordinary windows and for double-glazed windows.

Leave blank

Type of window	Heat loss (joules per second)
Ordinary window	224
Double-glazed window	116

The size of the windows and the temperature inside and outside the house are the same in each case.

(i) How many joules per second does using double glazing save?

.....

(1)

(ii) What is the heat loss through an ordinary window in one hour?

.....

.....

.....

(3)

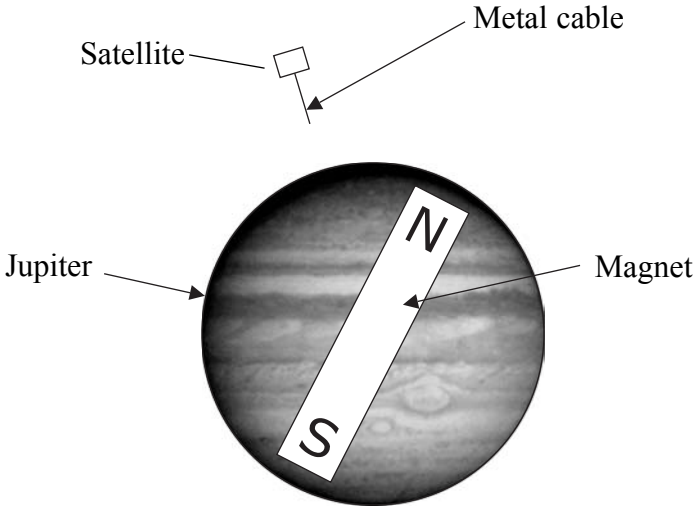
Q5

(Total 7 marks)

Turn over

6. The magnetic field of the planet Jupiter is similar to that of a large permanent magnet placed inside the planet as shown below.

Leave blank



A satellite with a long metal cable hanging from it could generate electrical energy as it moves through the magnetic field of Jupiter.

(a) State the effect that produces the electrical energy.

.....

(1)

(b) State and explain what happens to the size of the voltage induced in the metal cable if the satellite moves faster.

.....

.....

.....

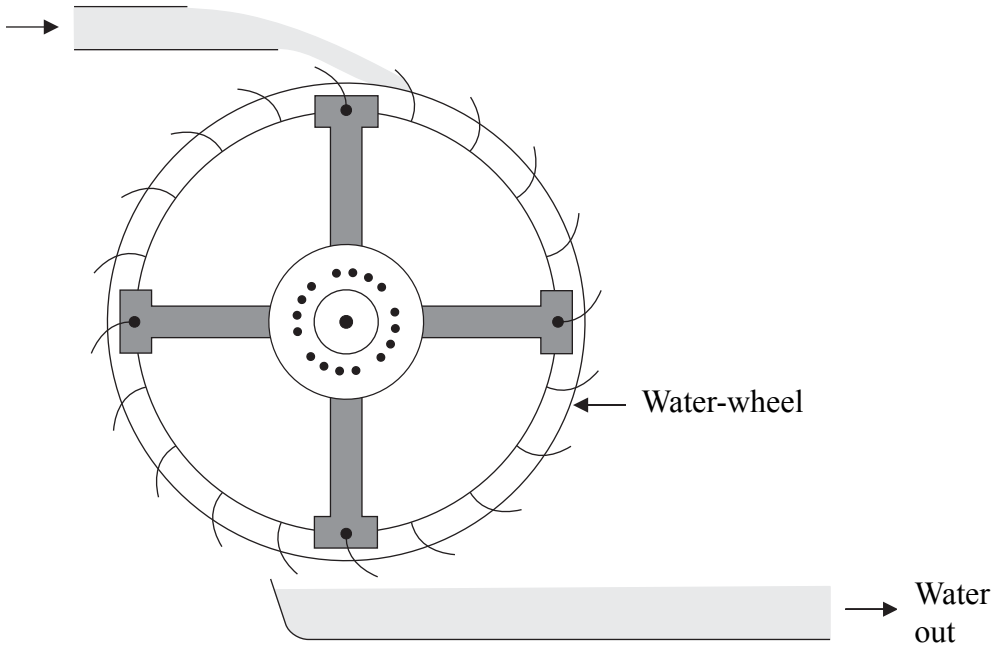
(3)

(Total 4 marks)

Q6

7. Water flows onto a water-wheel as shown in the diagram. The wheel is turned when the water strikes the blades. This is used to run a generator, which produces an electric current.

Leave blank



(a) State **two** main energy changes that take place during this process to produce electricity.

1 .....

2 .....

(2)

(b) The power delivered by the water is 2000 W. The electrical power produced is 1400 W. Calculate the overall efficiency of the process.

.....

.....

.....

(2)

(c) Suggest **two** reasons why the process is not 100% efficient.

1 .....

2 .....

(2)

Q7

(Total 6 marks)

Turn over

Leave blank

8. (a) The atoms $^{14}_{7}N$ and $^{15}_{7}N$ are isotopes of nitrogen.

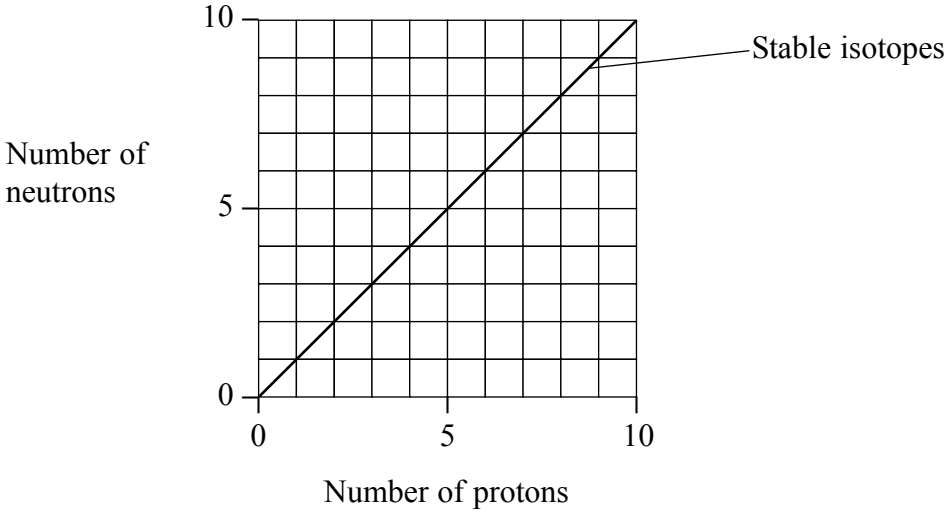
Write down **one** similarity and **one** difference between the nuclei of these isotopes.

similarity .....

difference .....

(2)

(b) The graph shows the relationship between the number of neutrons and the number of protons in some stable nuclei.



(i) What is the relationship between the number of protons and the number of neutrons for these stable nuclei?

.....

(1)

(ii) Use an **X** to mark the position of $^{15}_{7}N$ on the graph.

(1)

(iii) What does this tell you about $^{15}_{7}N$?

.....

(1)

Q8

(Total 5 marks)

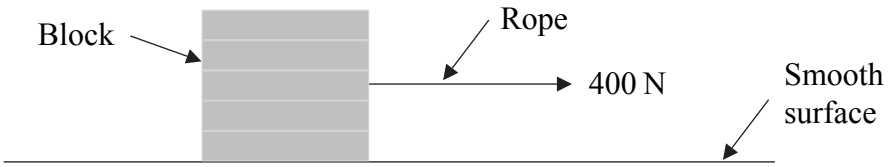
9. (a) Place a tick in the appropriate box to show whether the following quantities are vector or scalar.

Leave blank

Quantity	Vector	Scalar
Mass		
Acceleration		
Linear momentum		

(3)

(b) The diagram below shows a metal block on a smooth flat surface with a rope attached. Alex exerts a force of 400 N on a rope attached to the block and the block accelerates along the smooth surface.



The same block is pulled along a rough surface. To achieve the same acceleration, Carrie also needs to exert a force. She exerts a force of 350 N using another rope as shown below.

(i) Name the type of force that opposes the motion of the block.

.....

(1)

(ii) State the value of this force

.....

(1)

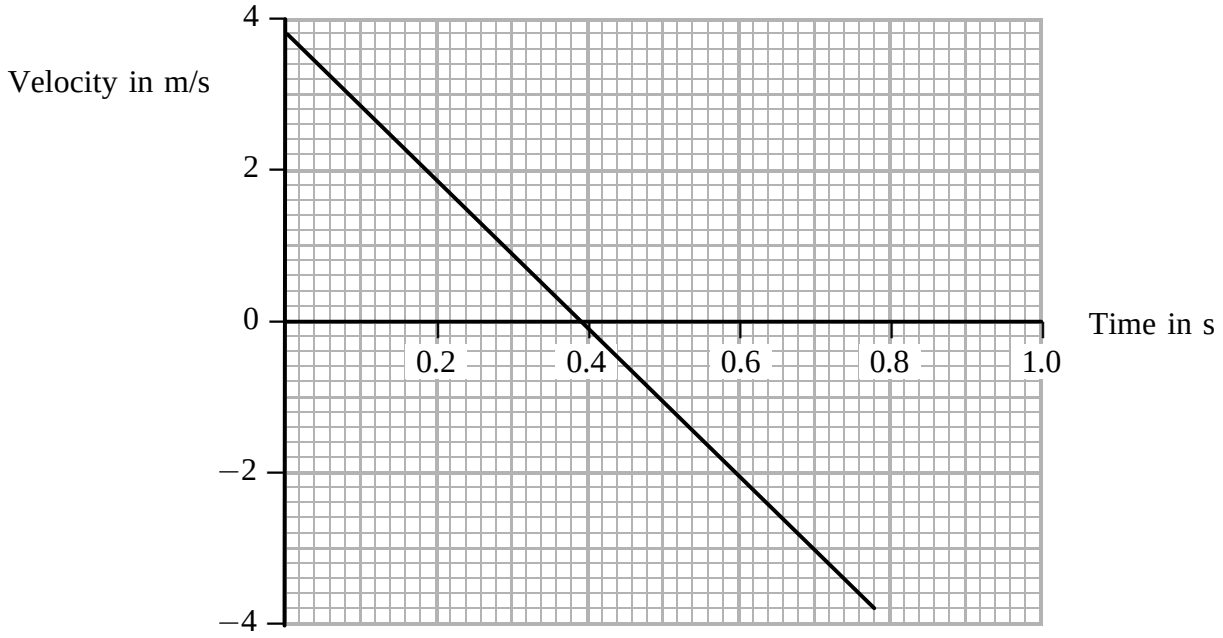
Q9

(Total 5 marks)

Turn over

10. The graph shows how the upwards velocity of an athlete changes after leaving the ground.

Leave blank



(a) After what time does the athlete reach his maximum height?

.....

(1)

(b) What height does the athlete reach?

.....

.....

.....

(3)

(c) (i) Calculate the acceleration of the athlete and state the unit in which it is measured.

.....

.....

.....

(4)

(ii) What is the direction of the acceleration?
Explain how you can tell from the graph.

.....

.....

(2)

(d) The mass of the athlete is 65 kg.
Calculate the force required to cause this acceleration.

Leave blank

.....

.....

.....

(3)

(e) Describe the force that causes the athlete's acceleration.

.....

(1)

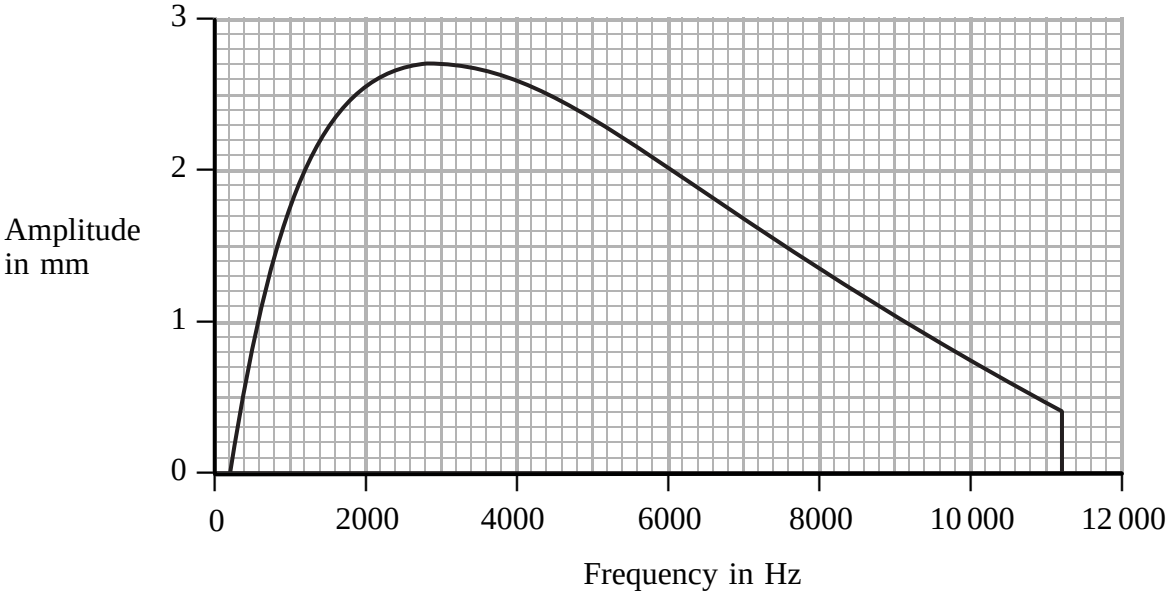
Q10

(Total 14 marks)

Turn over

Leave blank

11. The graph shows how the amplitude of vibration of a loudspeaker varies with the frequency of the signal, for a fixed signal voltage.



(a) Estimate the frequency of the loudest sound that the loudspeaker produces.
Explain your answer.

.....

.....

(2)

(b) What is the frequency of the highest-pitched sound that the loudspeaker produces?

.....

(1)

(c) Explain whether the loudspeaker can produce the full range of sounds that a human ear can detect.

.....

.....

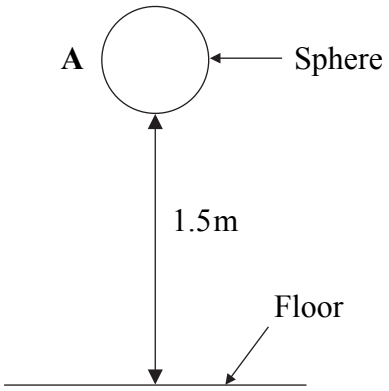
(2)

Q11

(Total 5 marks)

12. A sphere of mass 6.0 kg is raised a distance of 1.5 m above the floor, to position **A**, as shown in the diagram below.

Leave blank



(a) Name the type of energy possessed by the sphere at **A**.

.....

(1)

(b) Calculate the amount of this type of energy possessed by the sphere at **A**. Assume the acceleration free fall, g=10m/s^2

.....

.....

.....

(3)

The sphere is now dropped onto the floor.

(c) Name the type of energy that the sphere possesses just before it strikes the floor.

.....

(1)

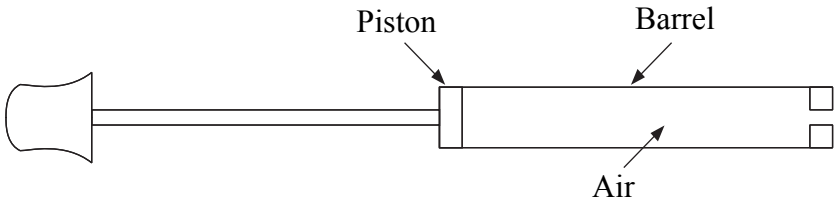
Q12

(Total 5 marks)

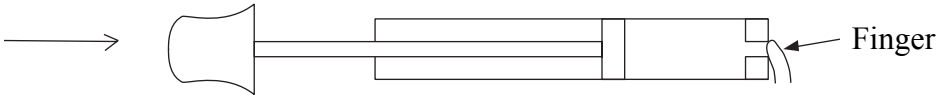
Turn over

13. The diagram shows a bicycle pump which can be used for pumping air into a bicycle tyre. The volume of the air in the barrel is 18 cm^3 and the air pressure is 100 000 Pa.

Leave blank



A finger is placed over the end of the pump. The piston is moved very slowly to the position shown below so that the volume of the air trapped in the barrel is 6 cm^3.



(a) (i) Calculate the new air pressure in the pump.

.....

.....

.....

.....

(3)

(ii) State **two** assumptions that you have made in your calculation.

1 .....

2 .....

(2)

(b) What, if anything, has happened to the size of the diameter of the air molecules in the trapped air as a result of changing the volume of the air in the pump?

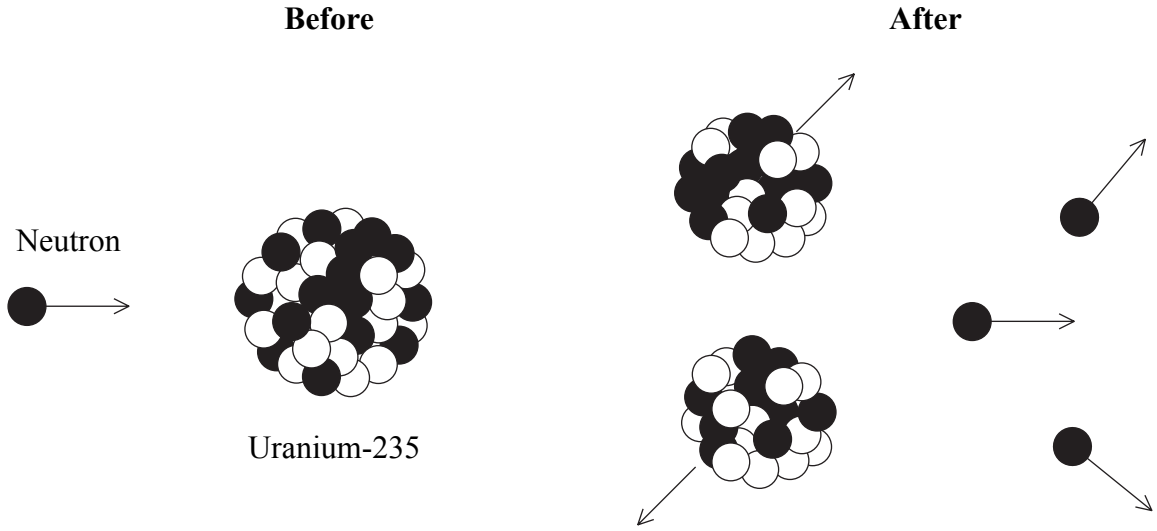
..... **Q13**

(1)

(Total 6 marks)

14. Uranium-235 is used as a fuel in nuclear reactors.
The diagram illustrates the process that takes place in a reactor.

Leave blank



(a) Name the process shown in the diagram.

.....

(1)

(b) During this process, energy is released. In what form is this energy?

.....

(1)

(c) Explain how this process could lead to a chain reaction.

.....

.....

.....

.....

(3)

(d) Name a component of a nuclear reactor and state its function.

Component .....

Function .....

(2)

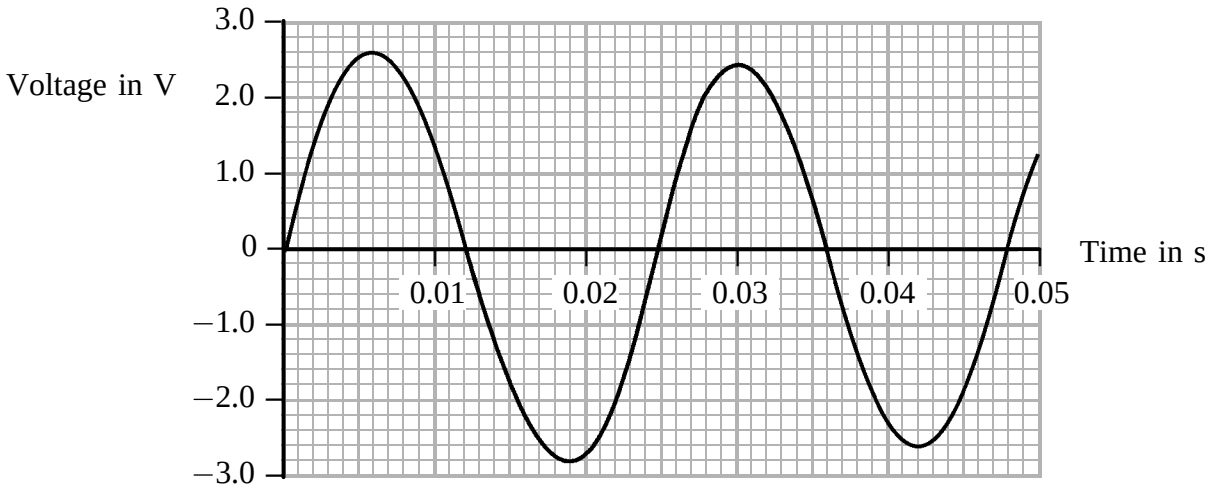
Q14

(Total 7 marks)

Turn over

15. The graph shows how the output voltage of a bicycle dynamo changes with time.

Leave blank



(a) (i) How can you tell that the dynamo produces an alternating voltage?

.....

(1)

(ii) Use the graph to write down the values of

the amplitude of the voltage .....

the period of the voltage .....

(2)

(iii) Calculate the frequency of the alternating voltage.

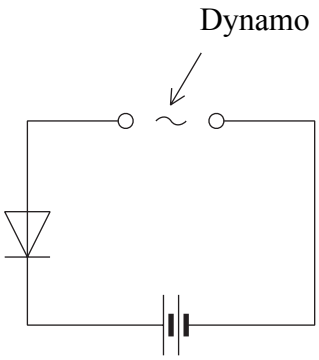
.....

.....

(2)

(b) The dynamo can be used to recharge a battery. The diagram shows the circuit that is used.

Leave blank



Suggest why the diode is included in the circuit.

.....

..... **Q15**

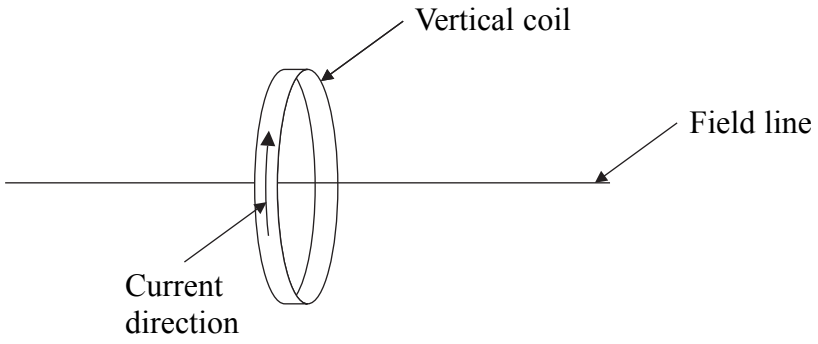
(2)

(Total 7 marks)

Turn over

Leave blank

16. (a) The diagram below shows a vertical circular coil carrying a current in the direction shown.



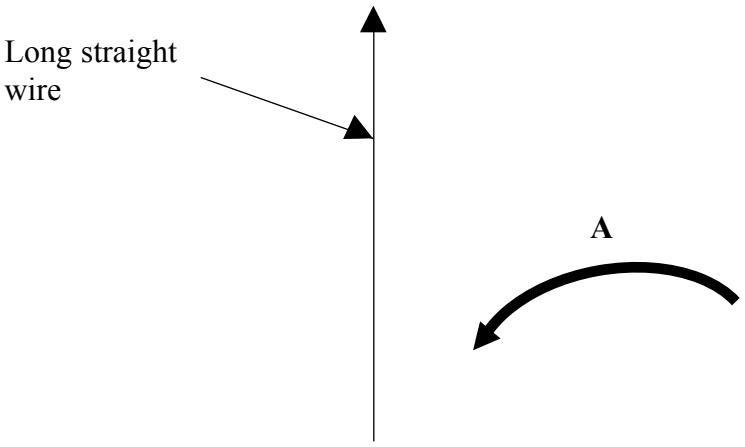
(i) A field line is drawn through the centre of the coil as shown. Draw an arrow on this line to show the direction of the magnetic field.

(1)

(ii) Draw on the diagram above **two** more magnetic field lines which pass through the coil.

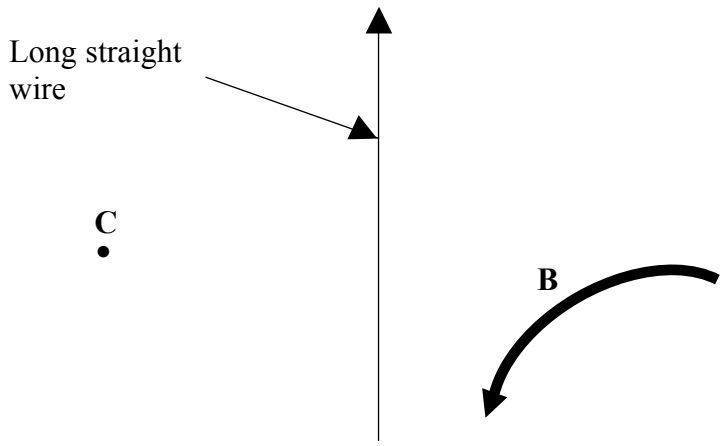
(2)

(b) The diagram below shows a beam of protons **A** being deflected by the magnetic field due to a current in a long straight wire.



(i) The diagram below shows another beam of protons, **B**.

Leave blank



Give **two** reasons why the deflection of this beam could be different from that of the beam **A**.

1 .....

2 .....

(2)

(ii) A third group of protons is at **C**.
State **two** conditions in which the protons at **C** would not be deflected at all.

1 .....

2 ..... **Q16**

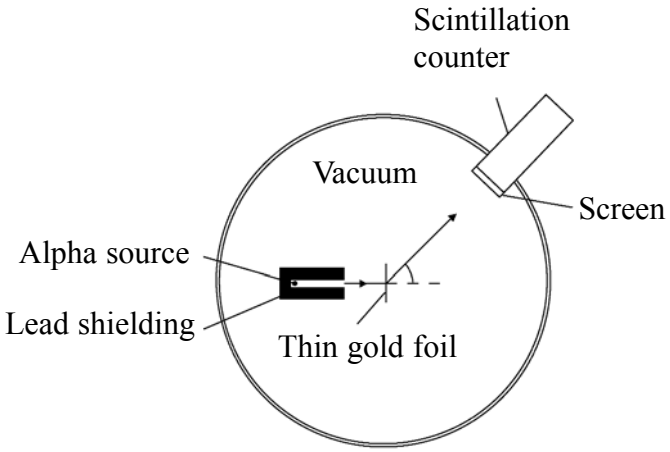
(2)

(Total 7 marks)

Turn over

17. The diagram shows the arrangement used by Geiger and Marsden to investigate the deflection of alpha particles when fired at thin gold foil.

Leave blank



(a) Explain why the experiment was carried out in a vacuum.

.....

.....

(2)

(b) The alpha source was surrounded by lead shielding with a long narrow opening in front of it. Suggest **two** reasons for this.

1 .....

2 .....

(2)

(c) The scintillation counter produced a flash when an alpha particle hit the screen. Describe the energy changes that take place when an alpha particle hits the screen.

Leave blank

.....

.....

.....

(2)

(d) Some scientists thought that the atom consisted of equally-spaced positive and negative charges.

(i) What evidence from the experiment suggested that this was not the case?

.....

.....

.....

(2)

(ii) What model of the atom did this experiment lead to?

.....

(1)

Q17

(Total 9 marks)

Turn over

Leave blank

18. (a) Carbon-14 is an unstable form of carbon.
It decays by beta emission into nitrogen.

(i) What is meant by the term **beta emission**?

.....

.....

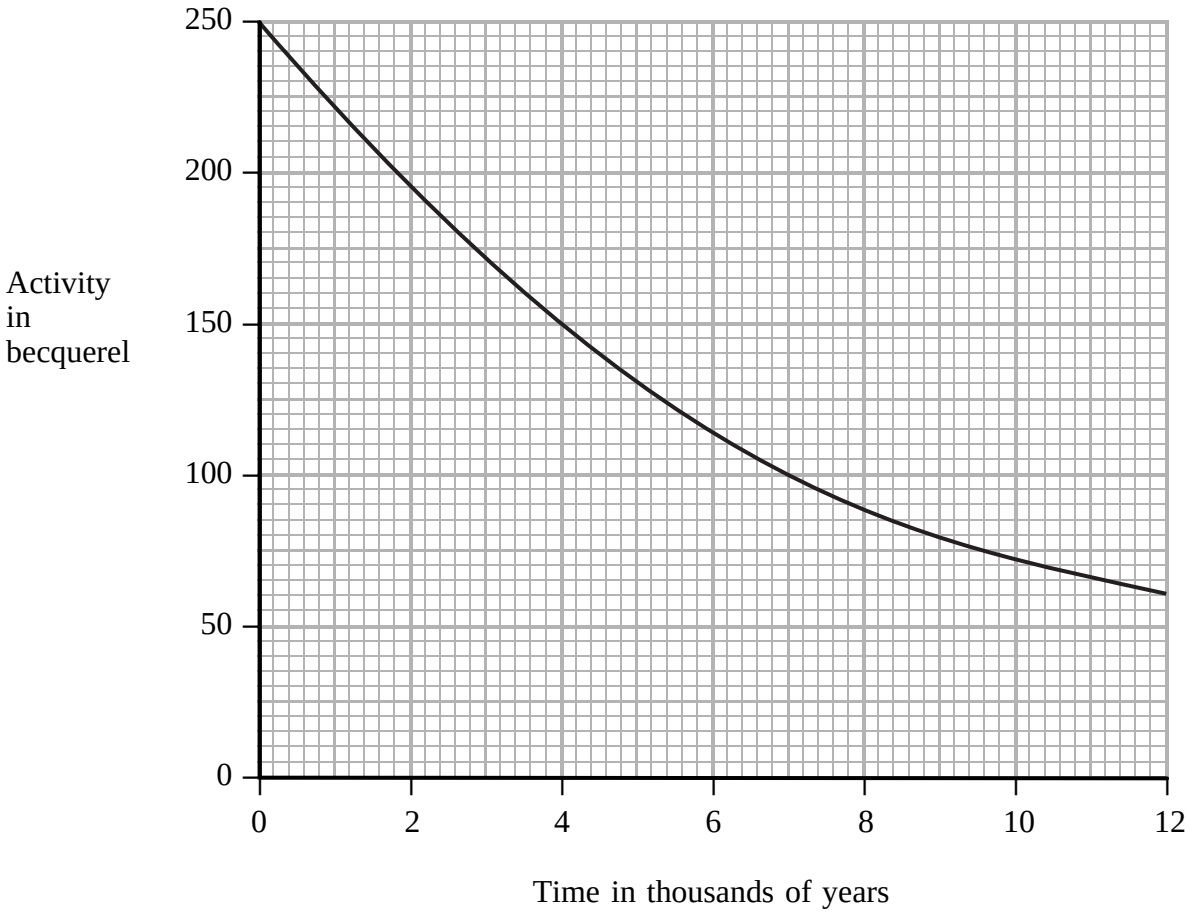
(2)

(ii) Complete the nuclear equation for this process.

$$^{14}_{6}C \longrightarrow {}^{0}_{-1}\beta + {}^{\ldots\ldots}_{\ldots\ldots}N$$

(2)

(b) Trees contain carbon-14 which is radioactive.
The graph shows how the activity of 1 kg of wood changes after a tree has died.



(i) Use the graph to determine the half-life of carbon-14.

Leave blank

.....

(1)

(ii) What fraction of the original carbon-14 is still present after two half-lives have elapsed since the tree died?

.....

(1)

(iii) A different radioactive sample has an initial activity of 200 becquerel and a longer half-life than carbon-14. Add to the graph a curve to show how its activity varies with time.

Q18

(2)

(Total 8 marks)

TOTAL FOR PAPER: 120 MARKS

END

Turn over

Leave blank

BLANK PAGE

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						4	4	2	0	/	0	3	Signature	

Paper Reference(s)

4420/3

Examiner's use only

Team Leader's use only

London Examinations IGCSE

Physics

Paper 3

Common to both Tiers

Specimen Paper

Time: 1 hour 15 minutes

Question Number	Leave Blank
1	
2	
3	
4	
Total	

Materials required for examination
Ruler
Protractor
Pencil

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number and candidate number, your surname, initial(s) and signature.
The paper reference is shown at the top of this page. Check that you have the correct question paper.
Answer **ALL** the questions in the spaces provided in this question paper.
Show all the steps in any calculations and state the units.
Calculators may be used.

Information for Candidates

There are 12 pages in this question paper. All blank pages are indicated.
The total mark for this paper is 50. The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

Advice to Candidates

You are reminded of the importance of clear English and careful presentation in your answers.

Printer's Log. No.
MP68700A

Turn over

W850/4420/57570 1/1/2/

London Examinations
from Edexcel International

1. (a) Diagram 1 shows a spring with a large pin attached alongside a vertical rule. The rule is marked in cm.

Leave blank

Diagram 2 shows the spring with a large mass attached to it.

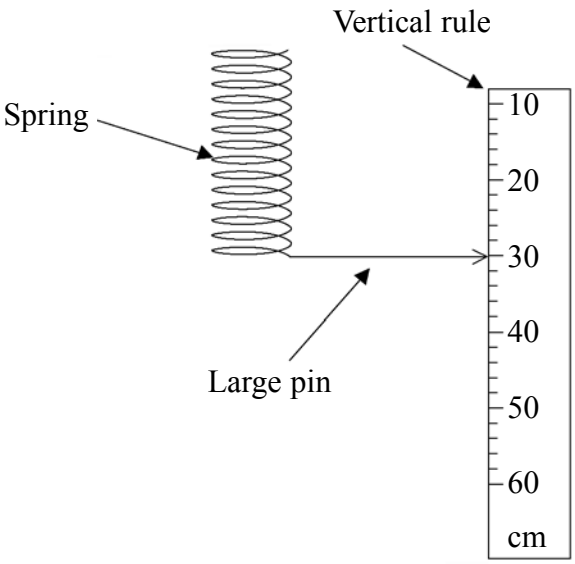


Diagram 1

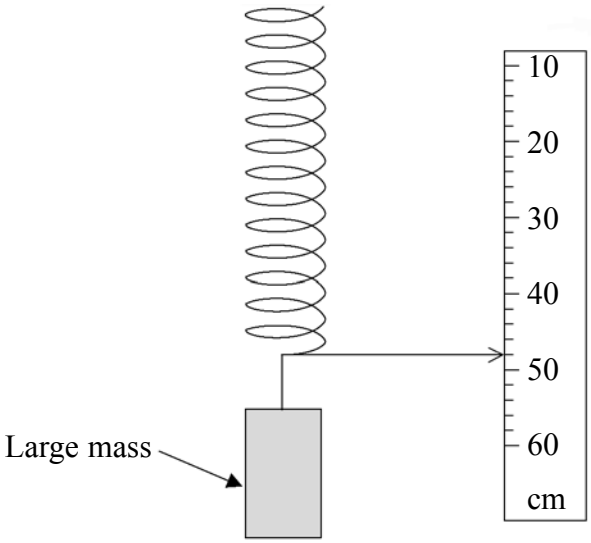


Diagram 2

(i) What is the initial reading on the vertical rule (Diagram 1)?

.....

(1)

(ii) What is the reading on the vertical rule when a large mass is attached to the spring (Diagram 2)?

.....

(1)

(iii) What is the extension of the spring as a result of adding the large mass?

.....

(1)

(iv) Describe **two** safety precautions that you would take in this experiment.

1 .....

.....

2 .....

.....

(2)

(b) Diagram 3 shows how a string is used to demonstrate the behaviour of a transverse wave.

Leave blank

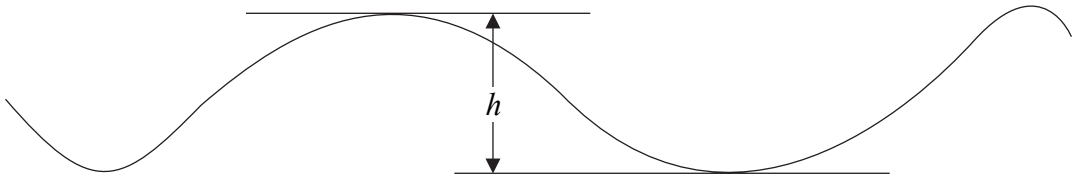


Diagram 3

(i) Distance *w* represents the wavelength of the wave. Show this distance on the diagram.

.....cm
(1)

(ii) Measure the distance *h*.

.....cm
(1)

(iii) What does distance *h* represent?

..... **Q1**
(1)

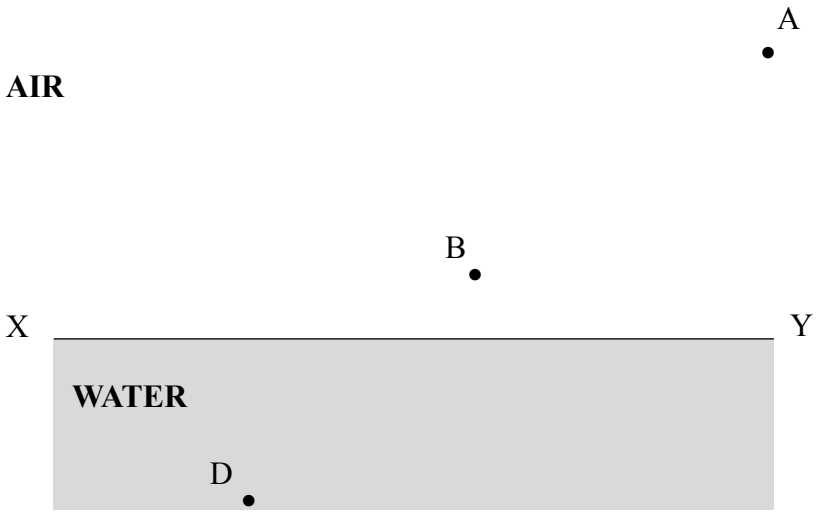
(Total 8 marks)

Turn over

2. A student carried out an experiment to demonstrate the bending of a ray of light as it travelled from air to water.

Leave blank

(a) In the diagram below, A and B are two points along the path of the light ray travelling in air. XY is the edge of a water tank. D is a point along the path of the same light ray travelling in water.



(i) Draw a straight line through A and B to show the path of the light ray travelling in air. Continue your line to meet the line XY. Label the point where the lines meet as 'C'.

(4)

(ii) Draw a straight line from C to D to show the path of the light ray travelling in water.

(1)

(iii) Measure the angles ACY and DCX and record their values below.

Angle measured in air ACY = ...

Angle measured in water DCX = ...

(2)

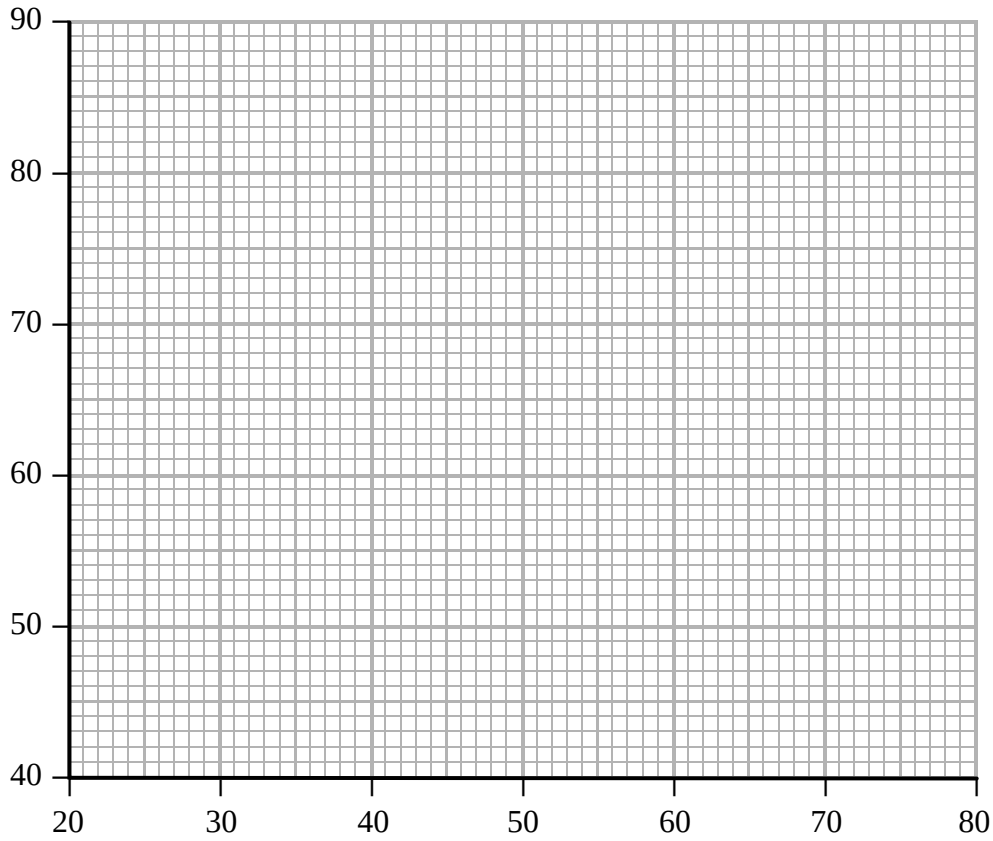
(b) The student recorded the following set of readings for different positions of A and B.

Angle measured in air/°	Angle measured in water/°
20	45
30	49
40	55
50	61
60	68
70	75

(i) On the grid below, plot a graph of angle measured in water (y-axis) against angle measured in air (x-axis). Label the axes of your graph on the dotted lines provided.

(3)

Leave blank



.....

.....

.....

(ii) Draw a smooth curve through your plotted points.

(1)

(iii) Plot your measured values from (a)(iii) in the graph. Label the point P.

(1)

(iv) Does P fit the pattern of the experiment? Explain your answer.

.....

.....

.....

.....

(2)

Q2

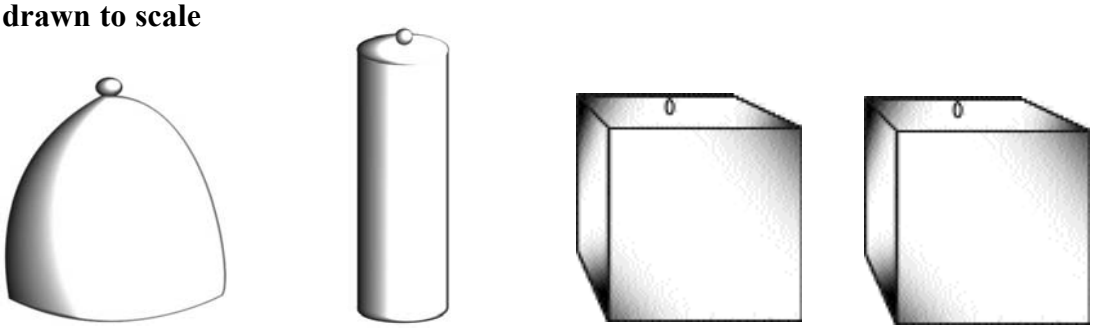
(Total 14 marks)

Turn over

3. A student carried out an experiment to find out the densities of four solid objects, A, B, C and D.

Leave blank

Objects NOT drawn to scale



A B C D

The student predicted that the two cubes C and D were made of the same material.

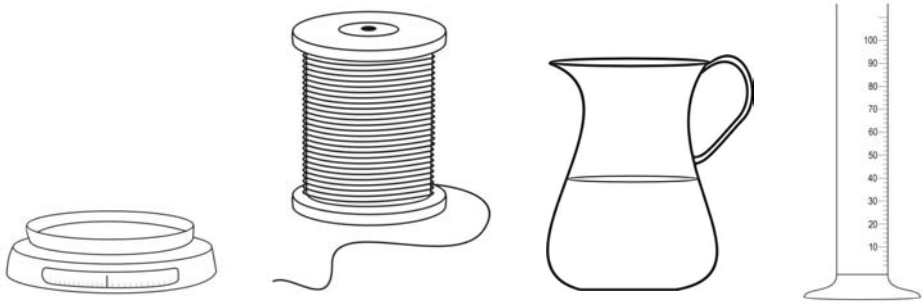
(a) The student was given the apparatus shown below.

Draw diagrams to show how the student may set up this apparatus to measure

(i) the mass of object A;

(ii) the volume of object A.

Write a brief method to describe what he did.



Apparatus NOT drawn to scale

Write your brief method here

Leave blank

.....

.....

.....

.....

.....

.....

(4)

(b) The student took measurements of the mass and volume for the other three objects. He calculated the density for each object. His results are shown in Table 1.

Table 1

Solid object	Mass / g	Volume / cm^3	Density / g / cm^3
A	75	23	.....
B	40	10	4.0
C	53	16	3.3
D	83	21	4.0

(i) **Complete Table 1** by determining the density of solid object A. Give your answer to an appropriate number of significant figures. You may use the space below for your calculations.

(3)

(ii) Justify the number of significant figures for your calculated values of density in (i).

.....

.....

.....

(2)

Turn over

(c) (i) Using Table 1, write a suitable conclusion for the student's experiment.

Leave blank

.....

.....

.....

(2)

(ii) Relate the results to the student's prediction.

.....

.....

(1)

(d) Another student points out that the reading for the mass of D in Table 1 is wrong. It should be 86 g.

In the space below show that this error in the mass reading has no effect on your conclusion in (c)(i).

Include a calculation.

Q3

(3)

(Total 15 marks)

Leave blank

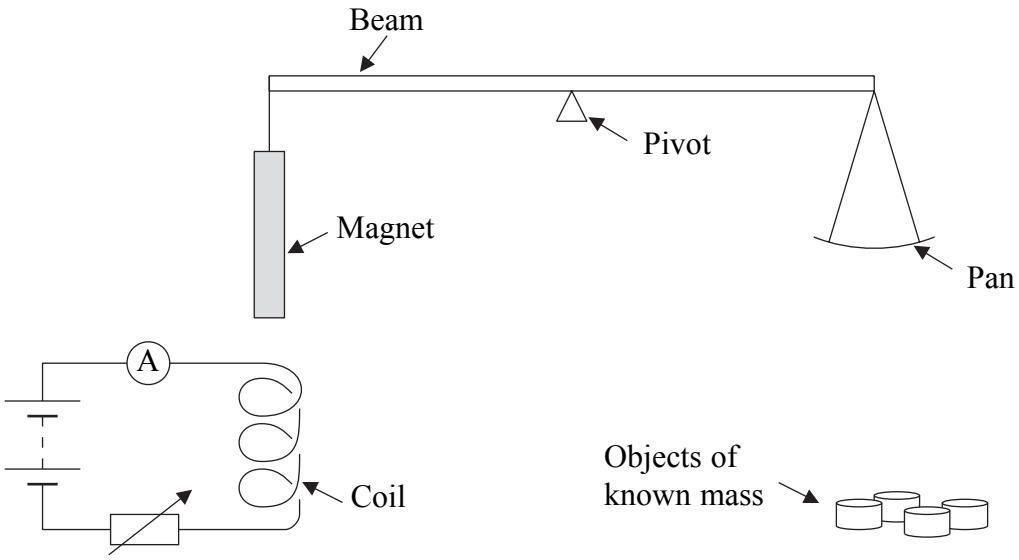
BLANK PAGE

Turn over

4. You have been asked to investigate the use of a suspended magnet to measure the mass of small objects.

Leave blank

A magnet and an empty pan of **equal** mass are suspended from a beam at equal distances from a pivot. **The pivot remains at the mid-point of the beam throughout.**



When an object of known mass is placed on the pan the beam tilts down to the right. When the current is switched on, the beam tilts down to the left.

(a) Describe how you would use the above apparatus and a number of objects of known mass to determine the relationship between current and mass.

.....

.....

.....

.....

.....

.....

.....

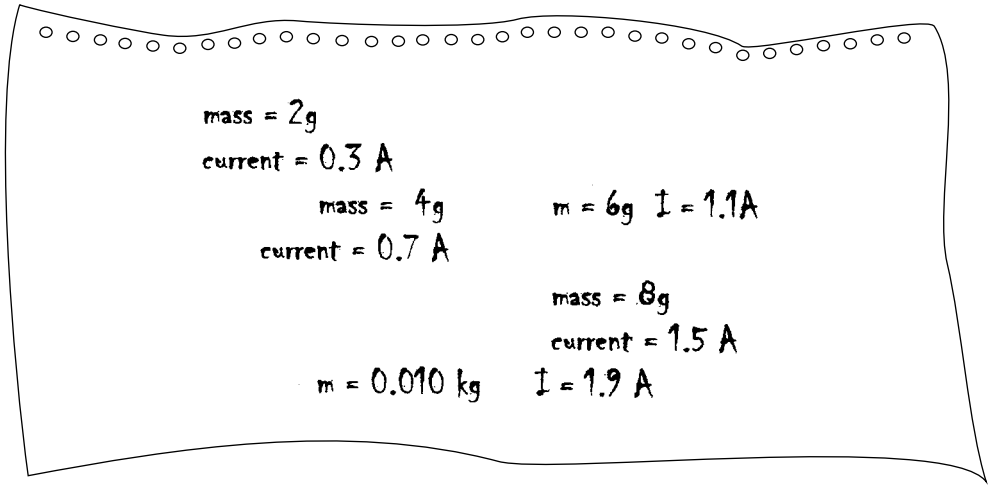
.....

.....

(4)

(b) (i) Here are a student's raw data. Display these data in the form of a table, with column headings and appropriate units.

Leave blank



(3)

(ii) Display the results as a sketch graph. In the spaces provided, write in the labels for the graph axes.

.....

.....

(2)

Turn over

(c) Describe how you would use the apparatus and the graph to find the mass of an unknown object, X.

Leave blank

.....

.....

.....

.....

.....

(2)

(d) The apparatus can be adjusted to enable larger masses to be measured **without increasing the current**. State and explain **one** other way in which this might be done.

An example is given below.

State ..... *increase number of turns on coil* .....

Explain ..... *stronger force between magnet and coil* .....

.....

State .....

Explain .....

.....

(2)

Q4

(Total 13 marks)

TOTAL FOR PAPER: 50 MARKS

END

Edexcel International

London Examinations

IGCSE

IGCSE in Physics (4420)

Mark Scheme for Specimen Paper

Paper 1F (Foundation Tier)

MARK SCHEME FOR
LONDON EXAMINATIONS IGCSE IN PHYSICS (4420)
SPECIMEN PAPER 1F
FOUNDATION TIER

1.	(a)	12(m)	1
	(b)	increases	1
		cyclist moves further in same time interval/each time	1
	(c)	$20 < X < 28$	1
			(Total 4 marks)

2.	(a)(i)	torch **and** lamp (either order)	1
	(ii)	vacuum cleaner	1
	(iii)	vacuum cleaner **and** lamp (either order)	1
	(iv)	torch	1
	(b)(i)	3	1
	(ii)	symbol correct (circle with a V inside only)	1
		position correct (in parallel with battery)	1
	(iii)	would get less bright (reject 'go out')	1
			(Total 8 marks)

3.	(a)	friction electrostatic electrons attract	4
	(b)(i)	correct direction of movement shown (towards earthed metal plate)	1
	(ii)	repelled from positive grid attracted to earthed plates (allow like charges repel/unlike charges attract for 1 mark)	2
	(iii)	to make dust particles fall off/ in order to collect dust particles/to clean the plates	1
			(Total 8 marks)

4.	(a)(i)	become compressed/compacted/smaller/squashed/ decrease in size/go down/pushed together	1
	(ii)	shortest spring circled	1
	(iii)	most compressed/shortest spring	1
	(b)	use more springs (in the middle) use stiffer/stronger springs (in the middle) sensible use of material more coils in spring ANY TWO	2
	(c)(i)	arrow pointing down (ignore point of action)	1
	(ii)	downward	1
		Earth	1
			(Total 8 marks)

5.	(a)	D	1
	(b)(i)	**I** clearly behind mirror	1
		I in line with the nose and the same distance from the mirror	1
	(ii)	same size, upright, virtual (no marks for contradictory answers e.g. real and virtual) deduct one mark for each response in excess of three	3
			(Total 6 marks)
6.	(a)(i)	cooker highest power/most current	2
	(ii)	5A 5A > 4A	2
	(b)	each lamp has its own circuit each lamp can be switched separately each lamp has the same voltage each can operate at own power ANY TWO *accept reasons for rejection of series circuit*	2
			(Total 6 marks)
7.	(a)(i)	points plotted correctly	2
		smooth curve drawn	1
	(ii)	about 3km/h *depends on candidate's graph*	1
	(iii)	1160 (W)	1
	(iv)	not always windy/variable output/too much land needed	1
	(b)	kinetic/movement	1
		electrical	1
			(Total 8 marks)
8.	(a)	either pole labelled correctly (S N)	1
	(b)(i)	one arrow drawn correctly (away from N)	1
	(ii)	one line correct, not crossing (ignore arrow)	1
	(iii)	No Yes No (all three correct = 2, two correct = 1)	2
			(Total 5 marks)
9.	(a)	$V = IR$	1
		$= 0.020 \times 10\,000$	1
		$= 200$ (V)	1
	(b)	water can conduct electricity	1
		chance of electrocution/shock/current in body	1
	(c)	(large) current in earth wire/charge flow	1
		melts fuse in plug (which cuts supply off)	1
			(Total 7 marks)

10.	(a)	$v = f\lambda$	1
		$= 200\,000\ \text{Hz} \times 1500\ \text{m}$	1
		$= 300\,000\,000$ (m/s)	1
	(b)	C	1
			(Total 4 marks)
11.	(a)	infra red	1
	(b)	heating/cooking/remote control/any appropriate use (must be correct use of answer in (a))	1
	(c)	correct deviation at first boundary correct deviation at second boundary correct dispersion shown	3
			(Total 5 marks)
12.	(a)	moving gas particles	1
		hitting container walls	1
	(b)	increases	1
		increases	1
		stays the same	1
		stays the same	1
	(c)(i)	increases in proportion/linearly/steady rate	1
	(ii)	correctly indicated – intercept with horizontal axis	1
	(iii)	zero/minimum	1
			(Total 9 marks)
13.	(a)(i)	65%	1
	(ii)	door – draught excluder/curtains	1
		floor – carpets/wooden floors (damp proofing scores 1 out of 2)	1
	(b)(i)	108	1
	(ii)	224×60 (or 224×1 i.e. energy $\times$ time)	1
		$\times 60$	1
		$= 806\,400$ (J)	1
			(Total 7 marks)
14.	(a)	(electromagnet) induction – not mutual, magnetic	1
	(b)	greater/larger	1
		greater motion between field and cable/ more field lines cut	1
		at a greater rate/per second/more frequently	1
			(Total 4 marks)

15.	(a)	(gravitational) potential to kinetic	1
		kinetic to electrical	1
	(b)	144 / 2000	1
		= 70% or 0.7	1
		(70 or 0.7% scores 1 out of 2)	
	(c)	friction in the (generator/wheel)/heat due to friction	2
		water missing the blades OR	
		resistance in the generator wires OR	
		converted/changed to heat energy (ignore sound)	
		heat lost surroundings (0)	
		air resistance (0)	
		water stays on wheels (0)	

(Total 6 marks)

16.	(a)	similarity – number of protons/proton number/atomic number	1
		difference – number of neutrons/atomic mass (number) nucleon number	1
	(b)(i)	number of neutrons and protons are the same	1
	(ii)	X marked at (7,8)	1
	(iii)	unstable	1

(Total 5 marks)

TOTAL FOR PAPER: 100 MARKS

Edexcel International

London Examinations

IGCSE

IGCSE in Physics (4420)

Mark Scheme for Specimen Paper

Paper 2H (Higher Tier)

MARK SCHEME FOR
LONDON EXAMINATIONS IGCSE IN PHYSICS (4420)
SPECIMEN PAPER 2H
HIGHER TIER

1.	(a)	$V = IR$	1
		$= 0.020 \times 10\,000$	1
		$= 200$ (V)	1
	(b)	water can conduct electricity	1
		chance of electrocution/shock/current in body	1
	(c)	(large) current in earth wire/charge flow	1
		melts fuse in plug (which cuts supply off)	1
			(Total 7 marks)
2.	(a)	$v = f\lambda$	1
		$= 200\,000$ Hz $\times$ 1500 m	1
		$= 300\,000\,000$ (m/s)	1
	(b)	C	1
			(Total 4 marks)
3.	(a)	infra red	1
	(b)	heating/cooking/remote control/any appropriate use (must be correct use of answer in (a))	1
	(c)	correct deviation at first boundary correct deviation at second boundary correct dispersion shown	3
			(Total 5 marks)
4.	(a)	moving gas particles	1
		hitting container walls	1
	(b)	increases	1
		increases	1
		stays the same	1
		stays the same	1
	(c)(i)	increases in proportion/linearly/steady rate	1
	(ii)	correctly indicated – intercept with horizontal axis	1
	(iii)	zero/minimum	1
			(Total 9 marks)
5.	(a)(i)	65%	1
	(ii)	door – draught excluder/curtains	1
		floor – carpets/wooden floors	1
		(damp proofing scores 1 out of 2)	
	(b)(i)	108	1
	(ii)	224×60 (or 224×1 i.e. energy $\times$ time)	1
		$\times 60$	1
		$= 806\,400$ (J)	1
			(Total 7 marks)

6.	(a)	(electromagnet) induction –not mutual, magnetic	1
	(b)	greater/larger	1
		greater motion between field and cable/ more field lines cut	1
		at a greater rate/per second/more frequently	1
			(Total 4 marks)
7.	(a)	(gravitational) potential to kinetic	1
		kinetic to electrical	1
	(b)	1400/1200	1
		= 70% or 0.7	1
		(70 or 0.7% scores 1 out of 2)	
	(c)	friction in the (generator/wheel)/heat due to friction	2
		water missing the blades OR resistance in the generator wires OR converted/changed to heat energy (ignore sound)	
		heat lost surroundings (0)	
		air resistance (0)	
		water stays on wheels (0)	
			(Total 6 marks)
8.	(a)	similarity – number of protons/proton number/atomic number	1
		difference – number of neutrons/atomic mass (number) nucleon number	1
	(b)(i)	number of neutrons and protons are the same	1
	(ii)	X marked at (7,8)	1
	(iii)	unstable	1
			(Total 5 marks)
9.	(a)	scalar	1
		vector	1
		vector	1
	(b)(i)	friction	1
	(ii)	350 N	1
			(Total 5 marks)

10.	(a)	0.39(s)	1
	(b)	use area below graph	1
		$\frac{1}{2} \times 3.8 \times 0.39$	1
		$= 0.74$(m)	1
	(c)(i)	use $a = (v - u)/t$	1
		correct substitution	1
		$= 9.7$	1
		m/s^2	1
	(ii)	downwards	1
		negative gradient/backwards slope/slowing down /retardation/deceleration	1
	(d)	use $F = ma$	1
		65×9.7 ecf	1
		$= 630$ N	1
	(e)	downward pull of Earth/gravitational pull/weight	1
			(Total 14 marks)
11.	(a)	3000 ± 200 (Hz)	1
		greatest amplitude	1
	(b)	11 200 (Hz)	1
	(c)	does not reproduce lowest-pitched sounds	1
		does not produce highest-pitched sounds	1
		(accept no because human range is 20 Hz – 20 kHz for 2 marks)	
			(Total 5 marks)
12.	(a)	gpe (or pe)	1
	(b)	use of mgh	1
		$6.0 \times 1.5 \times 10$	1
		$= 90$ J	1
	(c)	kinetic	1
			(Total 5 marks)
13.	(a)(i)	use $pV =$ constant	1
		$100\,000 \times 18 = p \times 6$	1
		$p = 300\,000$ Pa	1
	(ii)	constant mass/no gas escapes	1
		constant temperature	1
	(b)	no change	1
			(Total 6 marks)
14.	(a)	(nuclear) fission	1
	(b)	kinetic/heat/thermal	1
	(c)	neutrons released cause further fissions more neutrons released rate of fission increases MAX THREE	3
	(d)	component: control rod OR moderator	1
		function: control rod: stop the neutrons moderator: slow down the neutrons	1
			(Total 7 marks)

15.	(a)(i)	voltage has both + and – values	1
	(ii)	±2.6 V	1
		0.024 s	1
	(iii)	f = 1/T = 1/0.024	1
		= 41.7 Hz	1
	(b)	conduct in one direction/create dc	1
		prevent discharge of battery	1
			(Total 7 marks)
16.	(a)(i)	right to left	1
	(ii)	separate lines through coil not crossing	1
		correct shape	1
	(b)(i)	larger/different current; slower/different speed stronger field at B ANY TWO	2
	(ii)	no current/C stationary/C moves parallel to field no field at C ANY TWO	2
			(Total 7 marks)
17.	(a)	slowed/stopped by air particles	1
		so they reach gold foil	1
	(b)	prevent alpha going behind/through sides absorbs stray alphas collimate beam ANY TWO	2
	(c)	kinetic to	1
		light	1
	(d)(i)	some large angle deflections	1
		some particles undeviated	1
	(ii)	nuclear model of atom	1
			(Total 9 marks)
18.	(a)(i)	electron/negative particle	1
		ONE OF high speed/emitted from nucleus	1
	(ii)	14	1
		7	1
	(b)(i)	5300 ± 100 years	1
	(ii)	$\frac{1}{4}$ / 25%	1
	(iii)	starts at 200 Bq	1
		less steep than first curve	1
			(Total 8 marks)

TOTAL FOR PAPER: 120 MARKS

Edexcel International

London Examinations

IGCSE

IGCSE in Physics (4420)

Mark Scheme for Specimen Paper

Paper 3 (Common to both Tiers)

MARK SCHEME FOR
LONDON EXAMINATION IGCSE IN PHYSICS (4420)
SPECIMEN PAPER 3
COMMON TO BOTH TIERS

1.	(a)(i)	30 cm		1F	O
	(ii)	48 cm		1F	O
	(iii)	18 cm		1C	A
	(iv)	safety concerning pin e.g. cover when not in use large mass falling goggles in case spring breaks spring secured at the top ANY TWO		2C	DD
	(b)(i)	show w on diagram		1F	O
	(ii)	h = 2.1 cm		1F	O
	(iii)	amplitude x 2 (twice the amplitude)		1C	A
			Total 8 marks		
2.	(a)(i)	straight line		1F	D
		line through A and B		1F	D
		AB continued to meet XY		1F	D
		C correctly labelled		1F	D
	(ii)	straight line drawn from C to D		1F	D
	(iii)	ACY = 36 + 1^{o}		1C	O
		DCX = 52 + 1^{o}		1C	O
	(b)(i)	axes labelled		1C	A
		plotting		2C	AA
	(ii)	smooth curve		1A	D
	(iii)	Point plotted and labelled P		1C	A
	(iv)	Yes because		1F	E
		point is on/near curve		1F	E
		(OR No because point is not near curve)			
			Total 14 marks		
3.	(a)	attach string to object water in measuring cylinder sufficient to cover object record volume 1 lower object into cylinder using thread record final volume 2 volume of object 2 object on balance mass from scale ANY FOUR		4C	4D
	(b)(i)	formula		1C	A

	correct 3.3 / 3.26 / 3.261		1C	A
	to 2 or 3 sf		1C	A
(ii)	mass to 2 s.f. volume to 2 s.f.		1A	E
	density to 2 or 3 s.f.		1C	E
(c)(i)	A and C same densities B and D	same densities	1C	A
	A and C same materials B and D	same materials	1C	A
(ii)	student wrong – different from each other		1C	E
(d)	density = 8.6 ≙ 2.1		1C	A
	= 4.1		1C	A
	similar value to A (4)		1A	E

Total 15 marks

4.(a)(i) place mass/weight in pan
current in coil/turn on current

vary current (using variable resistance)

note or add masses until balance is restored and note current value when balance is restored

change mass

repeat for more masses MAX 4 MARKS 4A 4P

(ii) table – mass / current values inserted 1C O
with units A and g (or kg) 1C O

mass (g)	current (A)
2	0.3
4	0.7
6	1.1
8	1.5
10	1.9

Axes labelled (with units) 1C A
Sketch straight line graph – current against mass 1C P

(iii) place unknown mass/weight on pan 1F P
note current 1A P
read mass off from graph 1A P

(b) State move coil upwards 1A P
Explain more attraction 1A E

State move pan towards centre or pivot towards pan
Explain smaller clockwise moment

State	use (soft) iron core (in coil
Explain	increase magnetic field (of electromagnet)
State	use stronger magnet
Explain	stronger force
State	use heavier magnet
Explain	need larger mass on pan to balance

ANY PAIR FOR TWO MARKS

Total 13 marks

TOTAL FOR PAPER : 50 MARKS

Allocation of marks targeted at grades A, C and F on Paper 3

Question	F	C	A	Total
1	4	4		8
2	7	6	1	14
3		13	2	15
4	2	6	5	13
Total	13	29	8	50

Allocation of marks for experimental and investigational skills on Paper 3

Question	P	D	O	A	E	Total
1		2	4	2		8
2		6	2	4	2	14
3		4	0	7	4	15
4	9	0	2	1	1	13
Total	9	12	8	14	7	50

Further copies of this publication are available from
Edexcel International Publications, Adamsway, Mansfield, Notts, NG18 4FN, UK

Telephone: +44 (0) 1623 450 781
Fax: +44 (0) 1623 450 481
Email: intpublications@linneydirect.com

Order Code UG013059 September 2003 Issue 1

For more information on Edexcel International, please contact our
International Customer Relations Unit on +44 (0) 190 884 7750
or visit www.edexcel-international.org
or email international@edexcel.org.uk
Edexcel Limited. Registered in England and Wales No. 4496750
Registered Office: 190 High Holborn, London WC1V 7BH, UK