GCSE

Specimen Papers and Mark Schemes

Edexcel GCSE
Science: Single Award B (1535)
Science: Double Award B (1536)
Biology B (1529)
Chemistry B (1539)
Physics B (1549)

For First Examination

Summer 2003

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Autumn 2000

Publications Code UG 009365

Contents

Paper Reference(s)

1535/01 1536/01 1529/01 1539/01 1549/01

Edexcel GCSE

GCSE Science B

Specimen Paper

Materials required for examination
None

Items included with question papers
None

Instructions to Candidates

In the boxes on each of the answer books, write your centre number, candidate number, surname and initials, the paper reference and your signature. If more than one paper reference is shown, you should write the one for which you have been entered.
Answer all questions in the spaces provided in the answer books.

Information for Candidates

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Candidates entered for 1535 Science: Single Award B have three answer books to complete, for Paper 1B, Paper 1C and Paper 1P. They each should be completed in 30 minutes, giving a total examination time of 1 hour 30 minutes.

Candidates entered for 1536 Science: Double Award B have three answer books to complete, for Paper 1B, Paper 1C and Paper 1P. They each should be completed in 30 minutes, giving a total examination time of 1 hour 30 minutes.

Candidates entered for 1529 Biology B have one answer book to complete, Paper 1B. It should be completed in 30 minutes.
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Centre Number						Paper reference	Surname	Initials
Candidate Number							Signature	

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1535/1B 1536/1B 1529/1B

Edexcel GCSE

Science: Single Award B
[1535]
Paper 1B

Science: Double Award B
[1536]
Paper 1B

Biology B
[1529]
Paper 1B

FOUNDATION TIER
Specimen Paper

Time: 30 minutes **N230900**

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
Total	

Materials required for the examination
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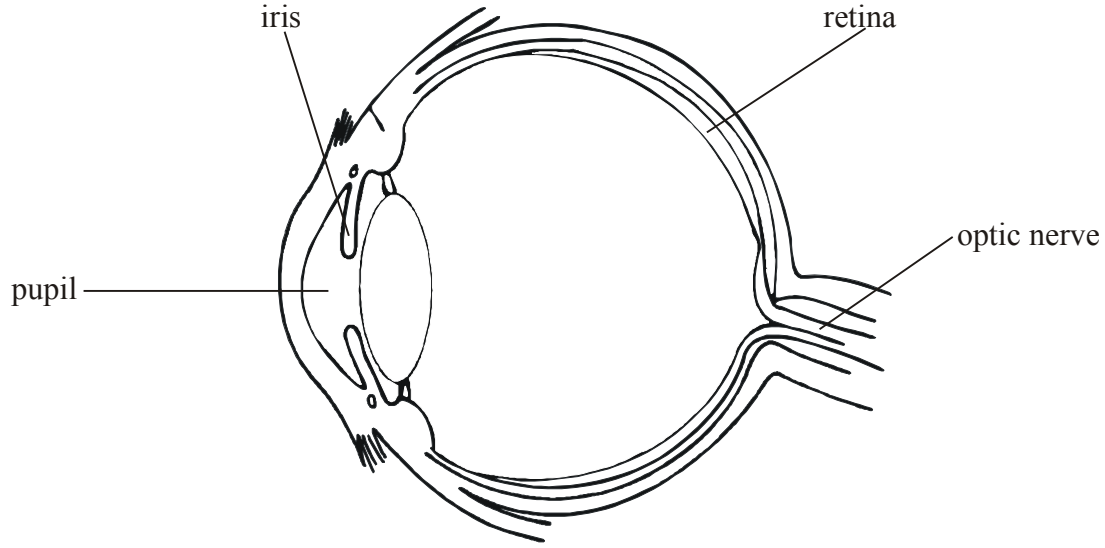
BLANK PAGE

1. The diagram shows a section through the eye.

Leave blank



List A gives the names of some parts of the eye.
List B gives the functions of these parts in a different order.

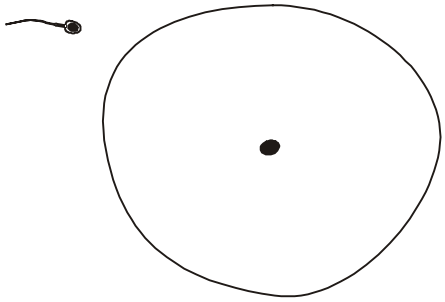
Draw a straight line from each part in list A to its function in list B.
One has been done for you

List A	List B
optic nerve	allows light to enter the eye
retina	creates nerve impulses
pupil	controls the amount of light entering the eye
iris	sends information to the brain

(Total 3 marks)

2. The diagram shows a sperm and an ovum just before fertilisation.

Leave blank



Choose the correct word from the box to complete the following sentence.

gamete	**tissue**	**zygote**

(a) At fertilisation, a sperm joins with an ovum to form a .....

(1)

(b) The sperm has a Y chromosome in its nucleus. The ovum has an X chromosome in its nucleus. Explain why the baby produced will be a boy, **not** a girl.

.....

.....

.....

.....

(2)

(c) When males reach puberty, the testes begin to produce sperm.
State TWO other changes that take place in the male body at puberty.

1 .....

2 .....

(2)

(Total 5 marks)

3. Many vehicles produce waste gases which cause air pollution.

Leave blank

(a) Name **one** harmful substance in the exhaust gases from a vehicle.

.....

(1)

(b) How does each of the following help to reduce air pollution?

(i) Speed limits

.....

.....

(1)

(ii) High fuel cost

.....

.....

(1)

(Total 3 marks)

4. A group of students went walking in the hills. When they stopped to rest, one boy felt very cold. He began to shiver. His friend suggested that he should curl up in a ball shape.

Leave blank

(a) Suggest why curling up in a ball helps to reduce heat loss from his body.

.....

.....

(1)

(b) How does shivering help to keep his body warm?

.....

.....

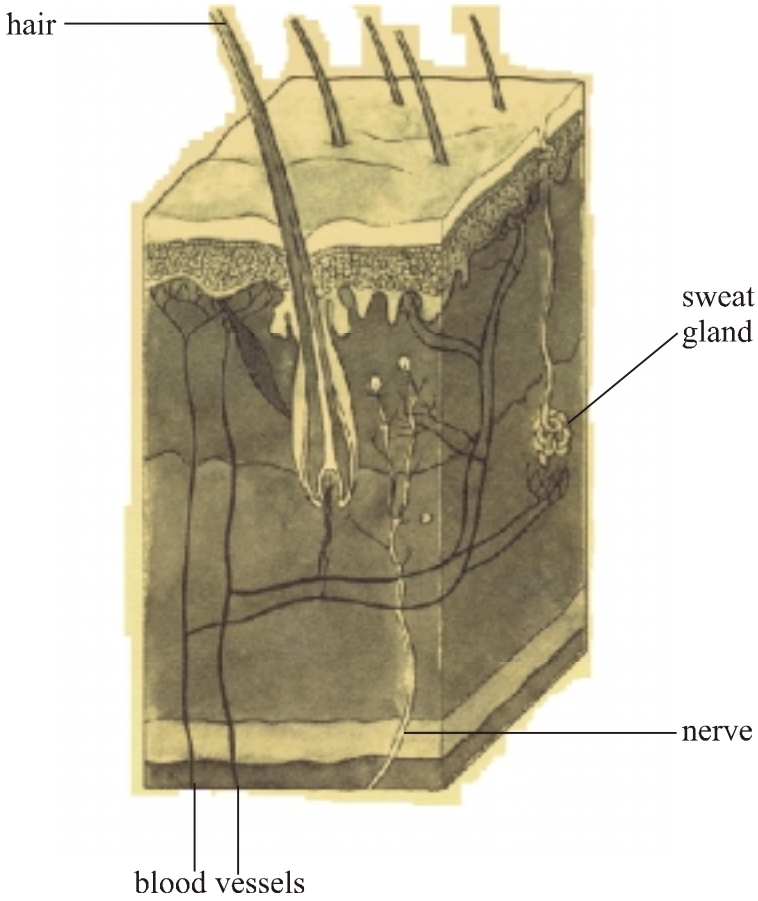
.....

.....

(2)

(c) The diagram shows a section of human skin.

Leave blank



Explain how sweat glands increase heat loss from the body.

.....

.....

.....

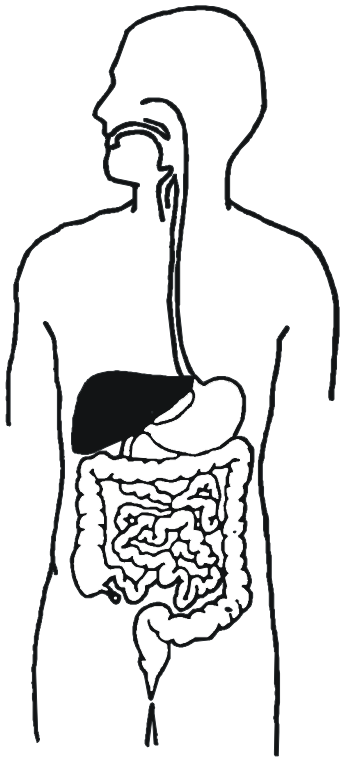
.....

(2)

(Total 5 marks)

Leave blank

5. The diagram shows the human digestive system.



(a) (i) The digestion of starch begins in the mouth.
Name the enzyme that digests starch.

.....

(1)

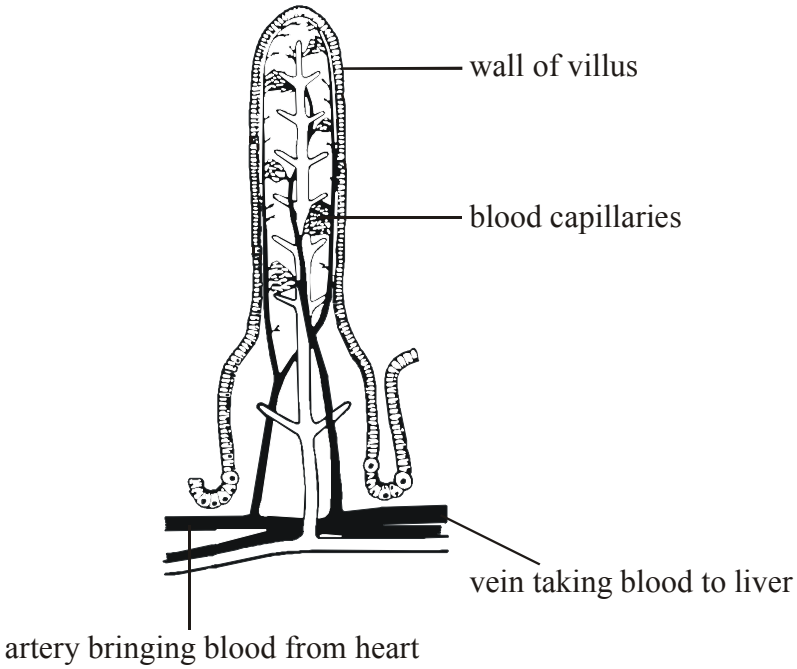
(ii) In which organ does the digestion of protein begin?

.....

(1)

(b) Digested food is absorbed into the blood through the villi. The diagram shows a section through a villus.

Leave blank



Describe TWO features of villi that help the absorption of digested food.

1. .....

2. .....

(2)

(c) People can get food poisoning from eating food containing harmful bacteria.
One effect of food poisoning is diarrhoea.
This means that only a little water is absorbed from the digestive system into the blood.

(i) On the diagram of **the digestive system opposite**, shade in the organ where most water is usually absorbed into the blood.

(1)

(ii) Explain why body temperature may rise if diarrhoea lasts for a few days.

.....

.....

.....

.....

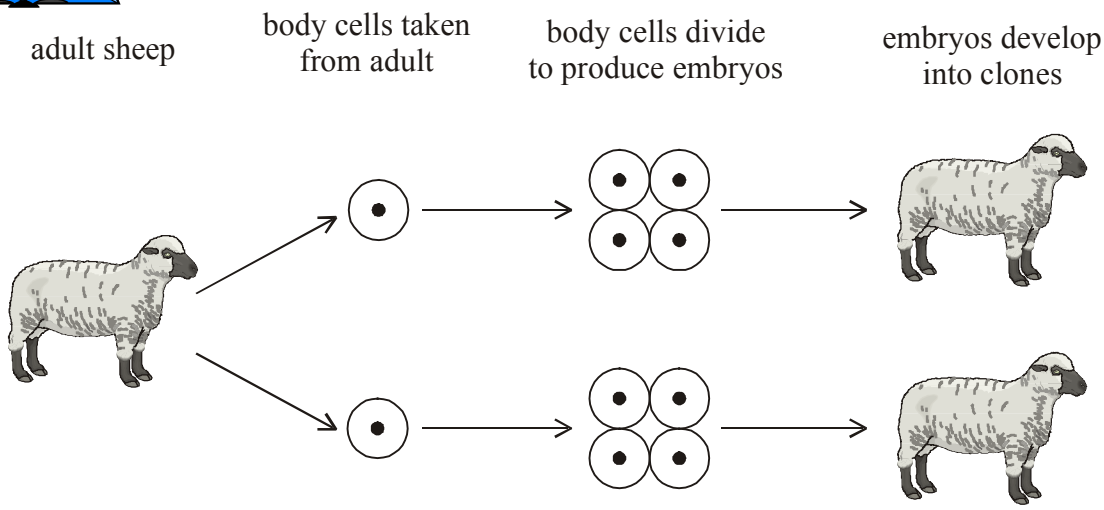
(2)

(Total 7 marks)

Leave blank

6. Scientists can now use body cells from an adult sheep to produce genetically identical copies of the adult. The copies are called clones.

The diagram shows some stages in this process.



(a) What type of reproduction produces clones?

.....

(1)

(b) Why must the body cells be protected from ultraviolet light and X-rays?

.....

.....

(1)

(c) In early experiments, many of the embryos died.

Suggest why this happened.

.....

.....

(1)

(d) The scientists did not publish the details of their early experiments.

Suggest why.

.....

.....

(1)

(e) After the successful production of clones, the scientists published the details of their methods. Scientists in other laboratories could then repeat the work.

Leave blank

Explain why it is important that scientists in other laboratories could repeat the cloning experiments.

.....

.....

.....

.....

.....

.....

(3)

(Total 7 marks)

TOTAL 30 MARKS

END

Centre Number						Paper reference	Surname	Initials
Candidate Number							Signature	

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1535/1C 1536/1C 1539/1C

Edexcel GCSE

Science: Single Award B
[1535]
Paper 1C

Science: Double Award B
[1536]
Paper 1C

Chemistry B
[1539]
Paper 1C

FOUNDATION TIER
Specimen Paper

Time: 30 minutes **N230900**

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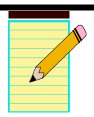
Advice to Candidates



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N230900

THE PERIODIC TABLE

Period	1	2	Group										3	4	5	6	7	0
1								1 H Hydrogen 1										4 He Helium 2
2	7 Li Lithium 3	9 Be Beryllium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
3	23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
4	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	63.5 Cu Copper 29	65.4 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
5	85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	99 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
6	133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
7	223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

Key

Relative atomic mass
Symbol
Name
Atomic number

1. (a) Use the periodic table opposite to help you answer these questions.

Leave blank

Give the:

(i) symbol for an atom of sulfur; .....

(ii) name of an element in the same group as carbon; .....

(iii) name of a metal; .....

(iv) number of electrons in a hydrogen atom; .....

(v) name of an element in group 6; .....

(vi) name of an element in period 2. .....

(6)

(b) The table below contains information about the halogens.

Name	Appearance at room temperature
fluorine	pale yellow gas
chlorine	green gas
bromine	red-brown liquid
iodine	grey solid

When chlorine was bubbled into potassium bromide solution, the solution turned red-brown. Use words from the box to complete the following sentences.

bromine	**copper**	**chlorine**	**fluorine**	**iodine**	**iron**	**rust**

The red-brown colour shows the presence of .....

This had been displaced by .....

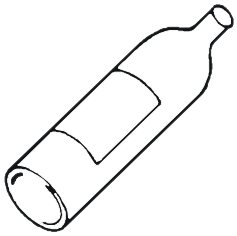
The most reactive halogen in the table is .....

(3)

(Total 9 marks)

Leave blank

2. (a) Plastics are used to make everyday objects.



Before the discovery of plastics, other materials were used to make these objects. Complete the table by giving an advantage of using plastic, rather than the other material, for each object.

Object	Other material	Advantage of plastic over other material
car bumper	steel	
carrier bag	paper	
lemonade bottle	glass	

(3)

(b) Plastics are made from crude oil. Describe how crude oil was formed.

.....

.....

.....

.....

.....

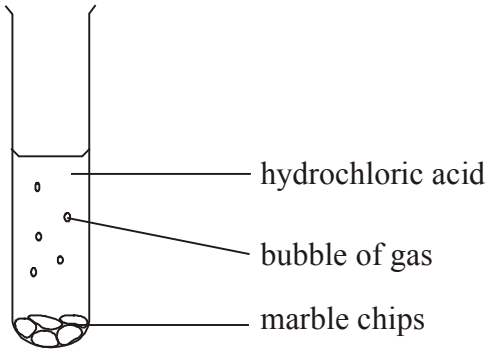
.....

(3)

(Total 6 marks)

3. Clare added hydrochloric acid to marble chips (calcium carbonate).

Leave blank



The reaction was slow.

Some changes which may speed up the reaction are listed in the table.
Put ticks in **three** boxes to show which of the changes speed up the reaction.

Change	**Tick if reaction speeds up**
adding more of the acid to the test tube	
adding water to the test tube	
grinding up the marble chips before adding the acid	
using a beaker rather than a test tube	
using more concentrated acid	
warming the test tube and contents	

(3)

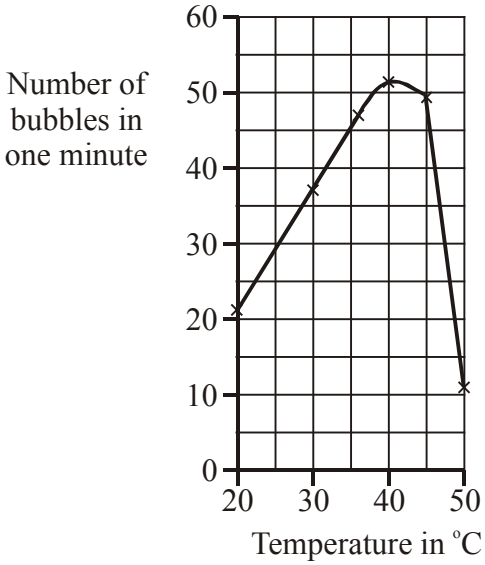
(Total 3 marks)

Leave blank

4. Alan and Mo investigated fermentation. The word equation for fermentation is:

$$\text{sugar} \xrightarrow{\text{yeast}} \text{ethanol} + \text{carbon dioxide}$$

They carried out the experiment at different temperatures using the same amounts of sugar and yeast. They used their results to draw this graph.



(a) At first, readings were taken at 20 °C, 30 °C, 40 °C and 50 °C. Alan and Mo then took two extra readings at 36 °C and 45 °C.
Suggest why it was important to take these extra readings.

.....

.....

(1)

(b) Why did the reaction slow down at temperatures above 40 °C?

.....

.....

.....

.....

(2)

(Total 3 marks)

5. (a) Natural gas is used as a fuel for heating and cooking. Natural gas contains the hydrocarbon methane.

Leave blank

(i) Write the balanced equation for the burning of methane in air.

.....

(3)

(ii) What is a hydrocarbon?

.....

.....

(2)

(b) In the early 1700's, scientists used the phlogiston theory to explain what happened when a substance burned.

This theory states that every substance is made of ash and phlogiston.
When a substance burns, the phlogiston escapes and the ash is left behind.

Lavoisier was a French scientist. He found that some substances became heavier when they burned.

(i) Explain how the work of Lavoisier showed that the phlogiston theory was wrong.

.....

.....

.....

.....

(2)

(ii) Use your knowledge of burning to explain the results of Lavoisier's experiments.

.....

.....

.....

.....

(2)

(Total 9 marks)

TOTAL 30 MARKS

END

Centre Number						Paper reference	Surname	Initials
Candidate Number							Signature	

1535/1P 1536/1P 1549/1P

Edexcel GCSE

Science: Single Award B
[1535]
Paper 1P
Science: Double Award B
[1536]
Paper 1P
Physics B
[1549]
Paper 1P
FOUNDATION TIER
Specimen Paper

Time: 30 minutes **N230900**

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2	
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Total	

Turn over

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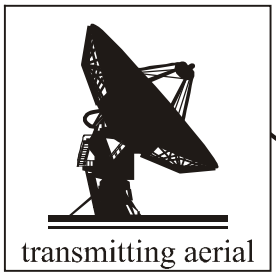
1. The diagrams show some everyday objects that produce waves.

Leave blank

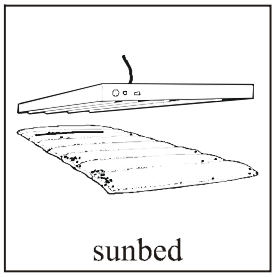
(a) Draw a line from each diagram to the type of wave that the object produces.

television remote control

loudspeaker



transmitting aerial



sunbed

sound

infra-red

ultraviolet

radio

(3)

(b) Which **one** of the waves is **not** in the electromagnetic spectrum?

.....

(1)

(c) Which **one** of the waves has a wavelength shorter than light?

.....

(1)

(Total 5 marks)

Leave blank

2. The following information should be used to answer this question.

cost = power in kW x time in h x cost of 1 kW h
cost of 1 kW h = 7 p

A family uses an 8 kW shower for half an hour (0.5 hours) each day.

Calculate the daily cost of using the shower.

.....

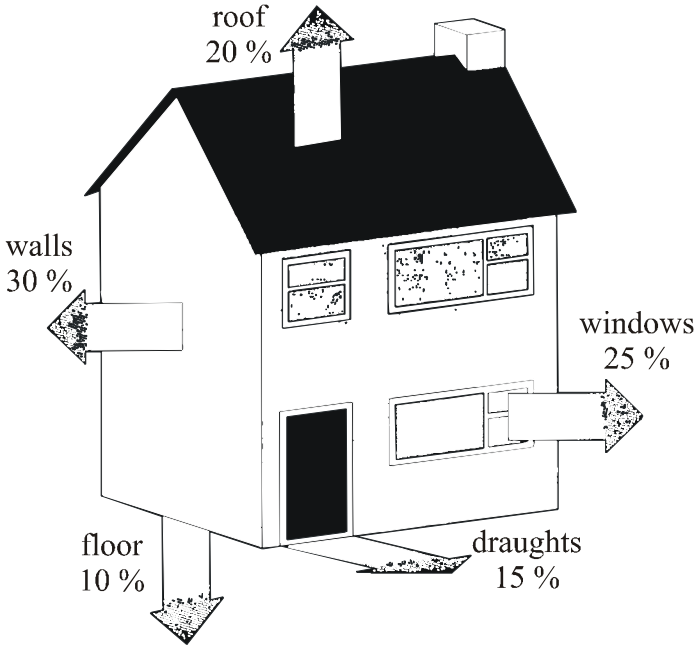
.....

.....

(Total 3 marks)

3. The diagram shows the energy flow from an uninsulated house.

Leave blank



(a) Explain why energy flows out of the house.

.....

.....

(1)

(b) Where does the greatest energy loss occur?

.....

(1)

(c) Suggest THREE ways of insulating the house.

1. .....

2. .....

3. .....

(3)

(d) Explain the advantages of insulating a house.

.....

.....

.....

.....

(2)

(Total 7 marks)

Leave blank

4. (a) The table compares some properties of alpha, beta and gamma radiation.

Radiation	Nature	Absorbed by
alpha	2 protons and 2 neutrons	card
beta	electron	aluminium foil
gamma	electromagnetic radiation	partially by lead sheet

(i) Which type of radiation carries a positive charge?

.....

(1)

(ii) Which **two** types of radiation would not pass through a brick wall?

1. .....

2. .....

(1)

(iii) Which type of radiation could be used to sterilise medical instruments wrapped in aluminium foil?

.....

(1)

(b) Carbon-14 ($^{14}_{6}C$) is a radioactive isotope of carbon.

Describe the difference between an atom of carbon-14 and an atom of carbon-12 ($^{12}_{6}C$) in terms of the particles they contain.

.....

.....

.....

.....

(2)

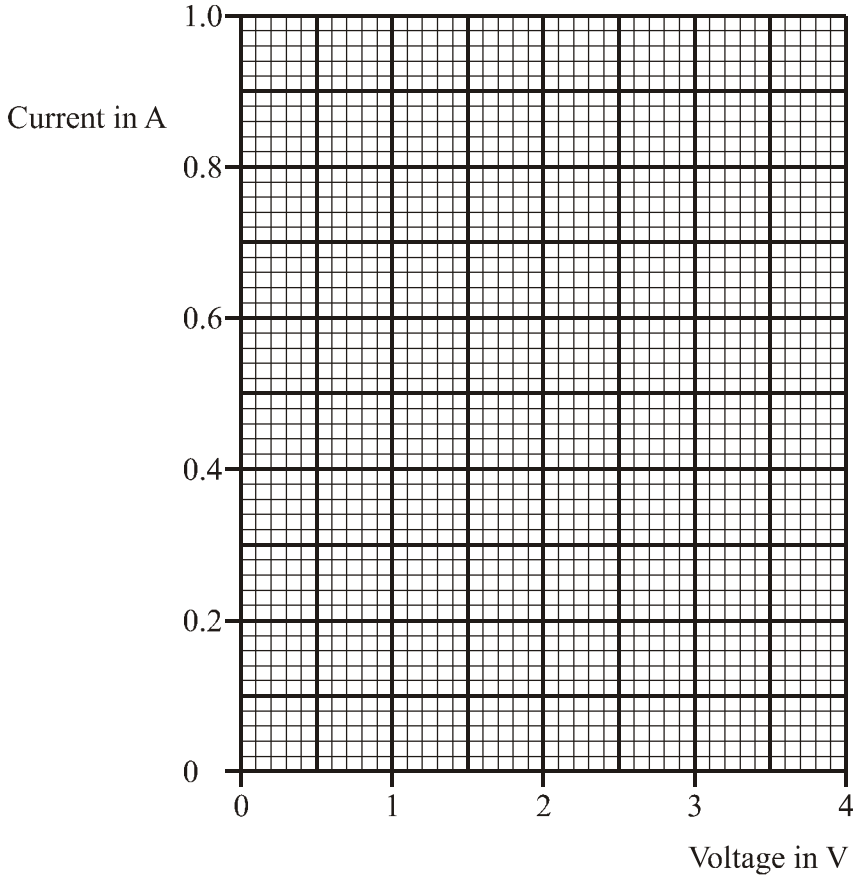
(Total 5 marks)

Leave blank

5. The current in a wire was measured at different voltages.
The table shows the results.

Current in amperes (A)	0.20	0.35	0.55	0.70	0.85
Voltage in volts (V)	0.8	1.4	2.2	2.8	3.4

(a) Use the data to draw a graph of current against voltage.



(3)

(b) Describe how the current in the wire changes when the voltage is increased.

.....

.....

.....

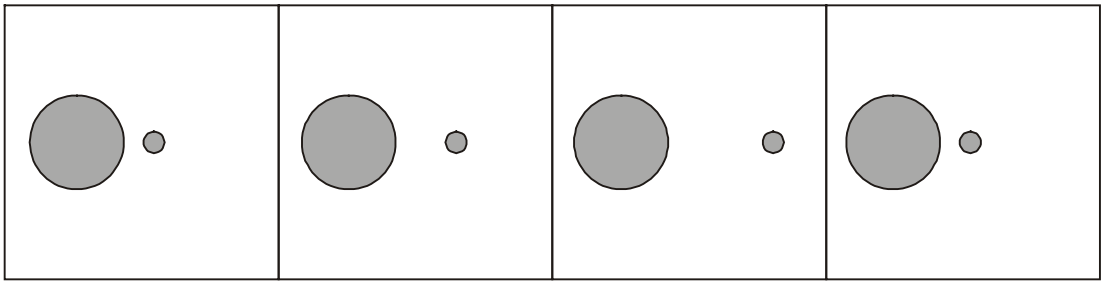
.....

(2)

(Total 5 marks)

Leave blank

6. In 1609, Galileo was one of the first scientists to use a telescope. He used it to look at the planet Jupiter. The diagrams show what he observed one night.



The small object close to Jupiter had not been seen before. It was later named Io.

(a) Suggest a conclusion that Galileo could draw from his observations.

.....

.....

(1)

(b) Explain how Galileo's observations went against the belief that all heavenly bodies revolve around the Earth.

.....

.....

.....

.....

.....

.....

(3)

(c) Galileo published his findings in a book called *The Starry Messenger*.
Why did Galileo publish his findings?

.....

.....

(1)

(Total 5 marks)

TOTAL 30 MARKS

END

Leave blank

Paper Reference(s)

1536/02 1529/02 1539/02 1549/02

Edexcel GCSE

GCSE Science B

Specimen Paper

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Centre Number						Paper Reference	Surname	Initials
Candidate Number							Signature	

1536/2B 1529/2B

Edexcel GCSE

Science: Double Award B

[1536]

Paper 2B

Biology B

[1529]

Paper 2B

FOUNDATION TIER

Specimen Paper

Time: 30 minutes **N230900**

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Include diagrams in your answers where these are helpful.

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The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

This paper has 5 questions. There is one blank page.

Advice to Candidates

This symbol shows where the quality of your written answer will also be assessed.

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Additional Answer Sheets may be used.

Turn over

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Success through qualifications

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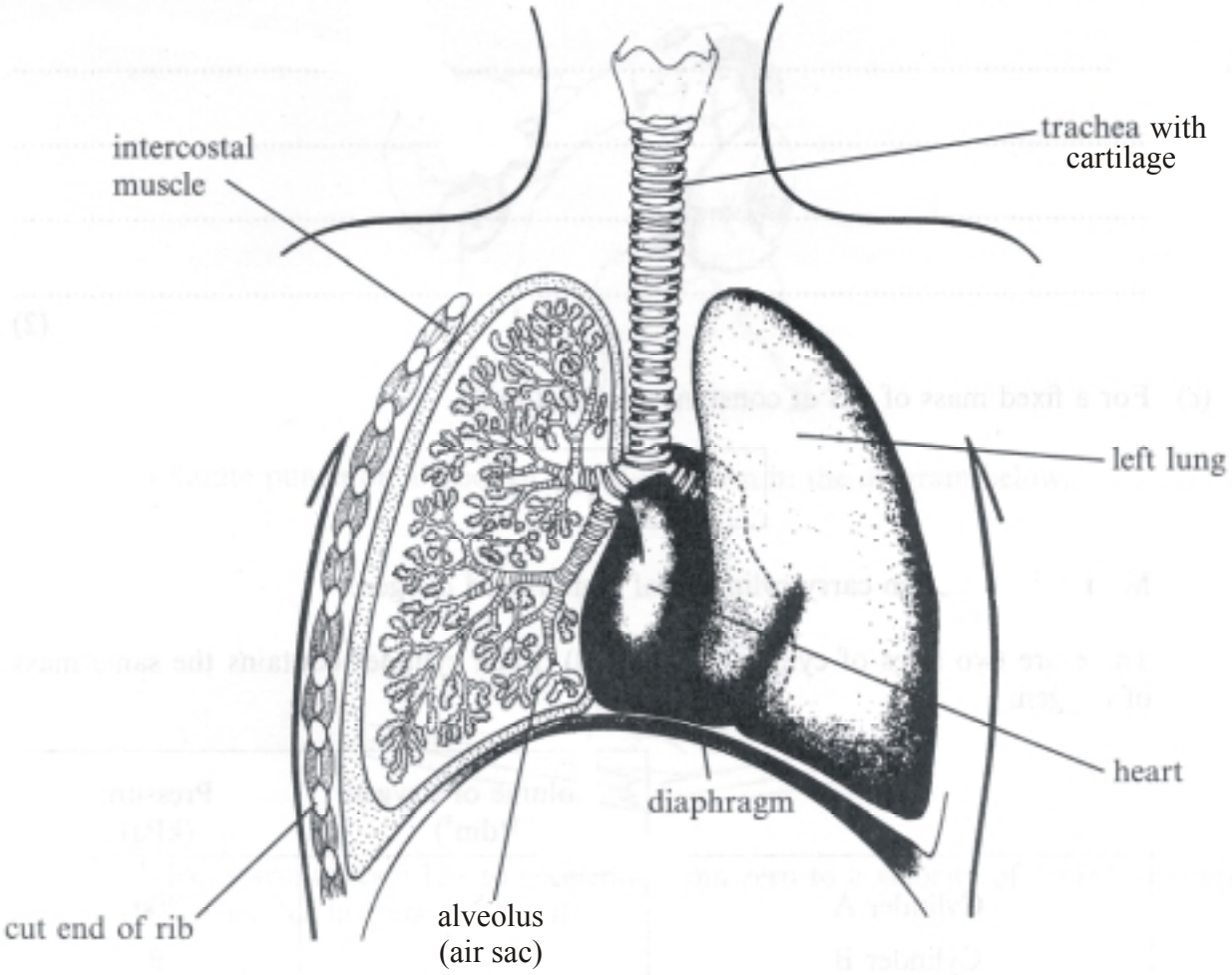
1. The diagram shows some of the structures found in the thorax (chest).

Leave blank



List A names some of the structures in the thorax.
List B gives the function of each structure, but in a different order.

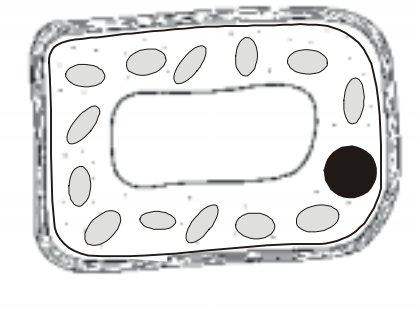
Draw a straight line from each structure in List A to its function in List B.
One has been done for you.

List A	List B
diaphragm	keeps the air passage open
heart	contracts during breathing in
alveolus	where gas exchange takes place
cartilage	pumps blood to the lungs

(Total 3 marks)

Leave blank

2. The diagram shows a plant cell.



(a) Label **two** parts that are found in **both** animal and plant cells.
Use words from the box.

cell membrane	**cell wall**	**chloroplast**	**cytoplasm**	**nucleus**

(4)

(b) Choose the correct word from the box below to complete the following sentence.

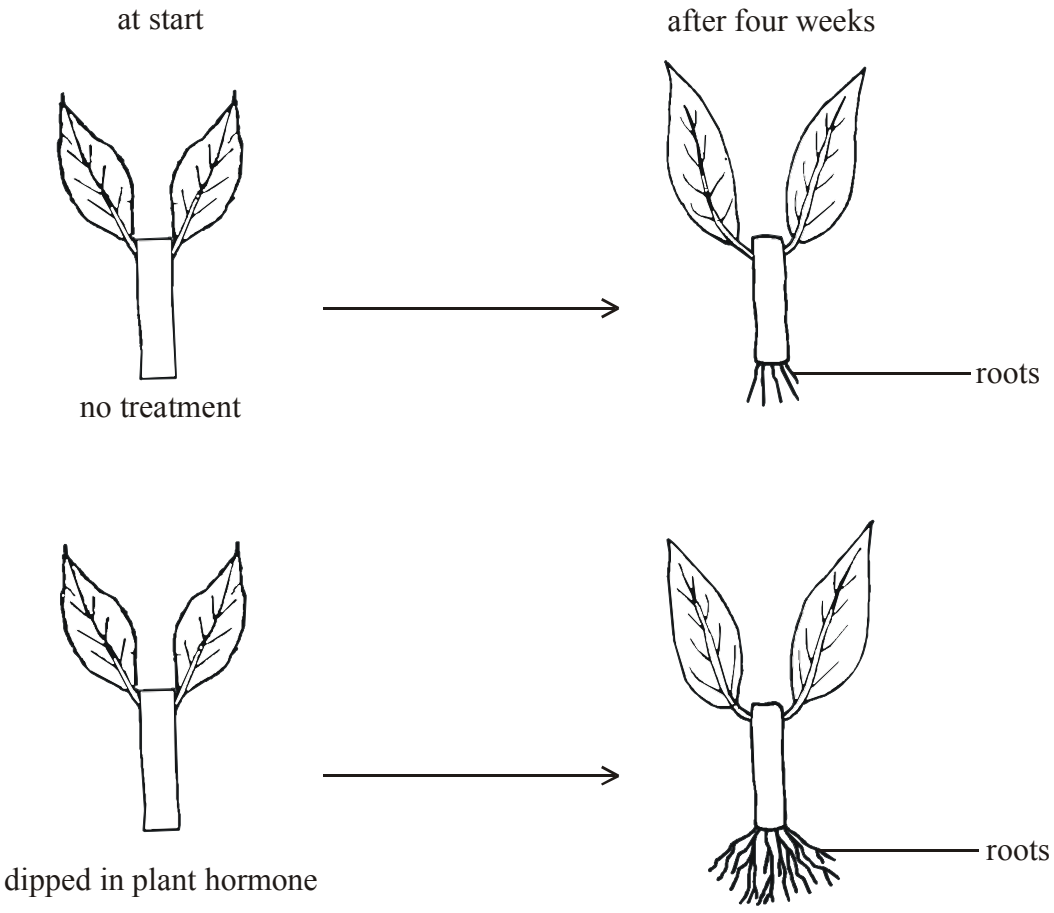
cellulose	**protein**	**starch**

The cell wall is made of .....

(1)

Leave blank

(c) Stephen took two similar cuttings from the stem of a plant. He dipped the end of one cutting in a plant hormone. Then he planted both cuttings in soil.
After four weeks, he removed both cuttings from the soil. The diagram shows what they looked like.



(i) What effect did the plant hormone have on the cutting?

.....

.....

.....

.....

(2)

(ii) Suggest how this will help the cutting to survive.

.....

.....

(1)

(Total 8 marks)

Leave blank

3. The diagram shows Sarah exercising.

(a) Complete the paragraph using words from the box.

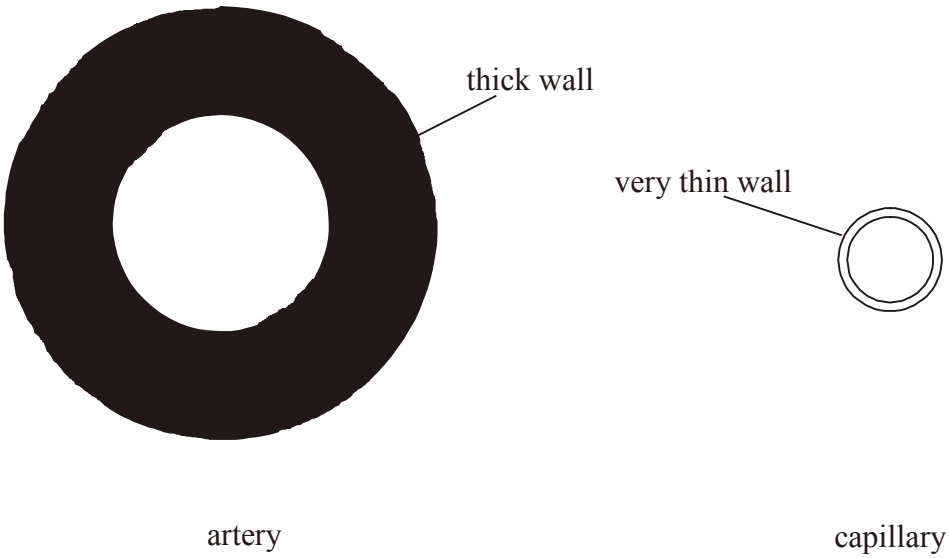
carbon dioxide	**nitrogen**	**oxygen**

When exercising, Sarah breathes faster because her muscles use more..... The air she breathes out contains more..... than the air she breathes in.

(2)

Leave blank

(b) The diagram shows two types of blood vessel.



artery capillary

(i) How does the thick wall of the artery help with its function?

.....

.....

(1)

(ii) How does the very thin wall of the capillary help with its function?

.....

.....

(1)

(c) A vein is another type of blood vessel.
There are valves inside a vein.

What is the function of these valves?

.....

.....

(1)

(Total 5 marks)

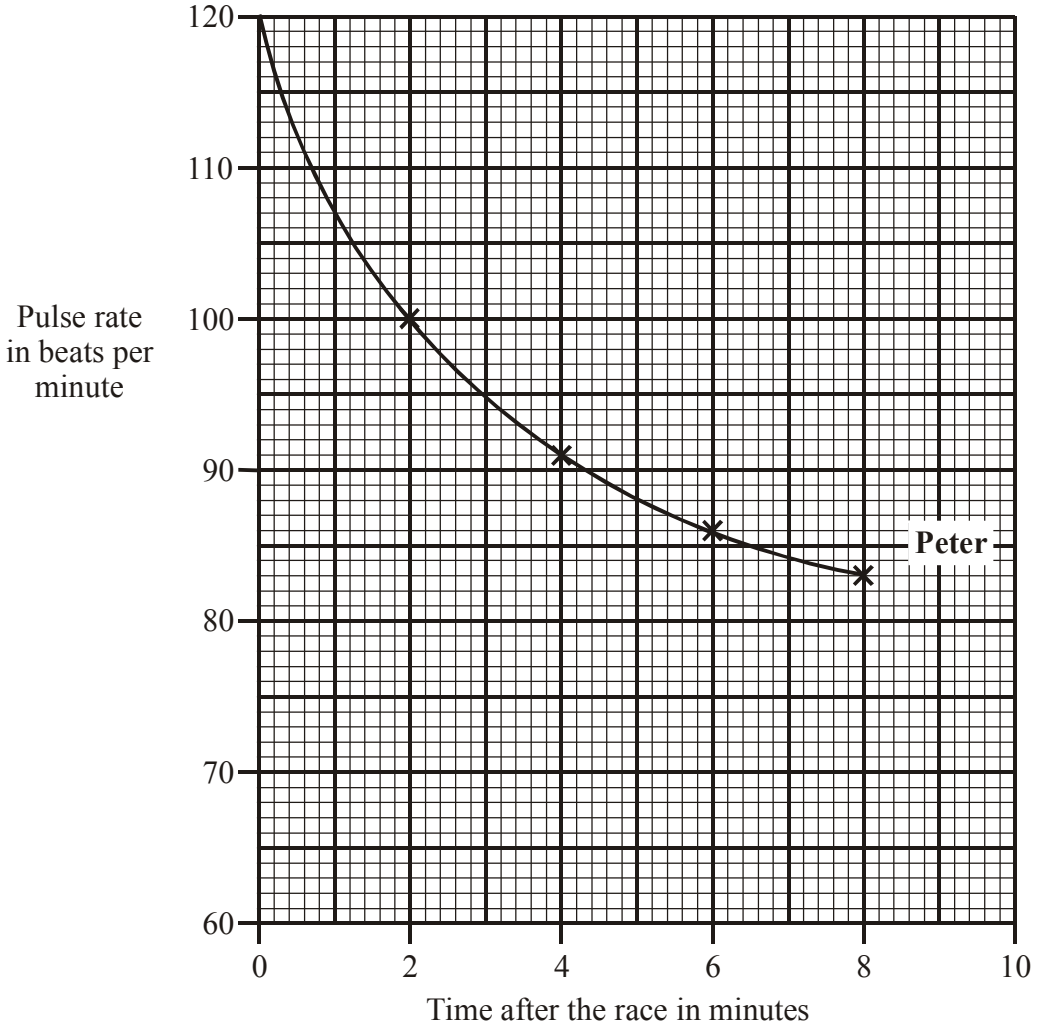
Leave blank

4. Two students, Peter and Kelly, ran an 800 metres race.
Before the race, when they were resting, Peter's pulse rate was 82 beats per minute and Kelly's was 70 beats per minute.
Just after the race, their teacher measured their pulse rates (beats per minute).
The teacher measured them again at 2 minute intervals.

The results are shown in the table below.

	Time after race (minutes)				
	0	2	4	6	8
Peter's pulse rate (beats per minute)	120	100	91	86	83
Kelly's pulse rate (beats per minute)	100	82	73	70	70

Peter's results are shown on the grid below.



(a) Draw a graph of Kelly's results on the grid.

(3)

(b) Recovery rate is one measure of fitness.

Leave blank

Explain how the graphs show that Kelly is probably fitter than Peter.

.....

.....

.....

.....

.....

.....

.....

.....

(4)

(Total 7 marks)

5. Read the newspaper article and then answer the questions.

Leave blank

Environmentally 'friendly herbicide' found

Biologists working on The Great Barrier Reef off the coast of Australia have discovered herbicides that are harmless to humans, other animals and crops.

Greenhouse trials show that some substances in reef organisms stop photosynthesis in weeds.

If field trials show the same results as the greenhouse trials, these substances could be a new class of herbicide which kills weeds without damaging the environment or crops.

The biologists got the idea for their work because they noticed that parts of the reef had no plants. They found about 5000 separate substances in the reef organisms. The biologists tested each substance for its effect until they found the substances they were looking for.

(a) Explain how the herbicides from reef organisms kill weeds.

.....

.....

.....

(2)

(b) Farmers already use herbicides to kill weeds.
Suggest why herbicides from reef organisms are described as a new class.

.....

(1)

(c) Suggest why the first trials were carried out in a greenhouse rather than in a field.

.....

.....

.....

(2)

(d) What observation gave the biologists the idea to do the research?

.....

(1)

(e) Explain why it was important to test each of the 5000 substances separately.

.....

(1)

(Total 7 Marks)

TOTAL 30 MARKS

END

Centre Number						Paper Reference	Surname	Initials
Candidate Number							Signature	

1536/2C 1539/2C

Edexcel GCSE

Science: Double Award B

[1536]

Paper 2C

Chemistry B

[1539]

Paper 2C

FOUNDATION TIER

Specimen Paper

Time: 30 minutes **N230900**

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Question Number	Leave Blank
1	
2	
3	
4	
Total	

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your signature, your surname and initials, then write the correct paper reference for your examination. The paper reference is shown below the boxes. If more than one paper reference is shown, you should write the one for which you have been entered.

Answer ALL questions in the spaces provided in this book.

Show all stages in any calculations and state the units. Calculators may be used.

Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

This paper has 4 questions. There are no blank pages.

Advice to Candidates

This symbol shows where the quality of your written answer will also be assessed.

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Turn over

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THE PERIODIC TABLE

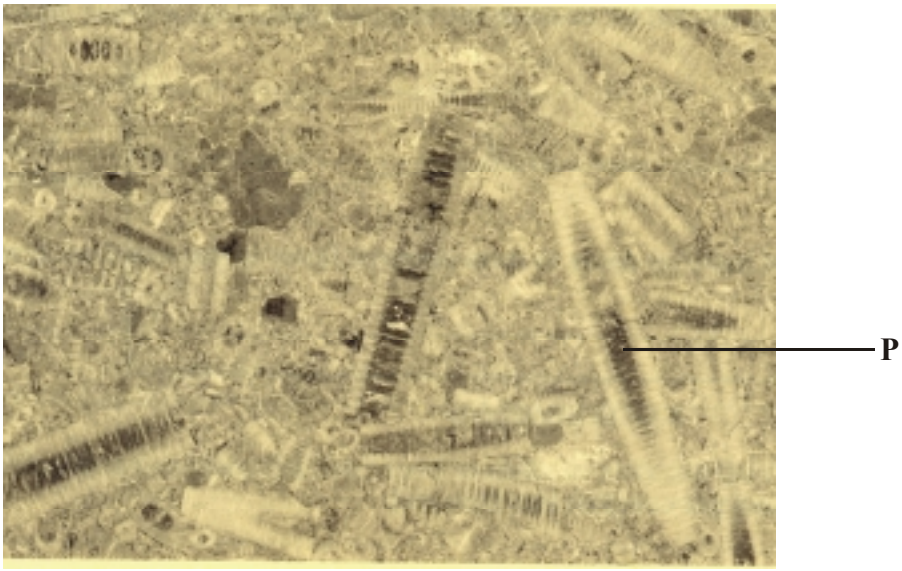
Period	1	2	Group										3	4	5	6	7	0
1	1 H Hydrogen 1																	4 He Helium 2
2	7 Li Lithium 3	9 Be Berylium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
3	23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
4	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	63.5 Cu Copper 29	65.4 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
5	85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	99 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
6	133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
7	223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

Key

Relative atomic mass
Symbol
Name
Atomic number

Leave blank

1. Carol and David found a piece of rock.
Part of its surface is shown in the photograph.



(a) David sees **P** and decides that the rock is the sedimentary rock, limestone.

If the rock is sedimentary, what is **P**?

.....

(1)

(b) Carol sees **P** and decides that the rock is the igneous rock, granite.

If the rock is igneous, what is **P**?

.....

(1)

(Total 2 marks)

Leave blank

2. (a) Scientists believe that when the Earth first formed it was very hot with many volcanoes.

Explain how oceans formed on the Earth's surface.

.....

.....

.....

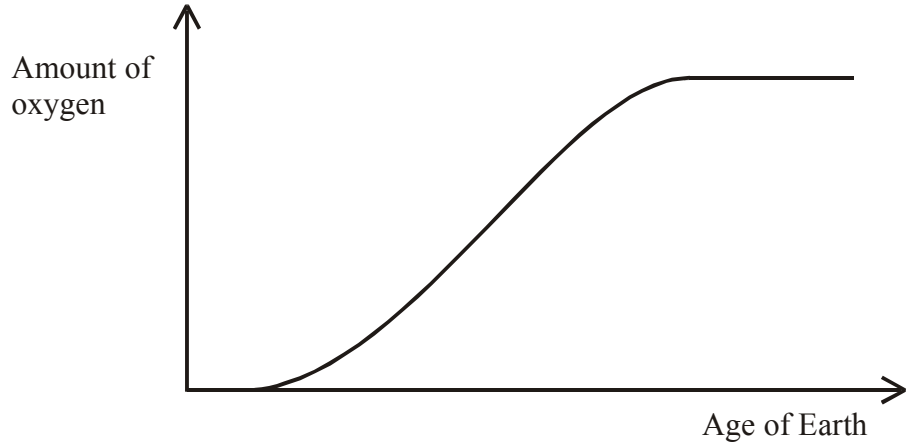
.....

.....

.....

(3)

(b) The first green plants on Earth produced oxygen. This caused a gradual increase in the amount of oxygen in the atmosphere. Then animals began to live on the Earth. The graph shows how the amount of oxygen in the atmosphere has changed since the Earth was formed.



Explain why the amount of oxygen in the atmosphere is now constant (does not rise or fall)

.....

.....

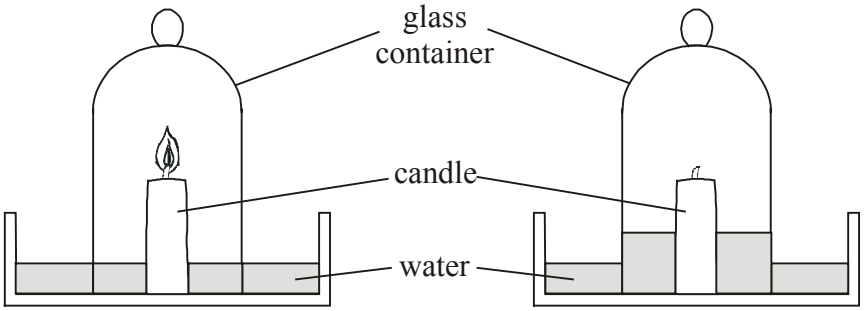
.....

.....

(2)

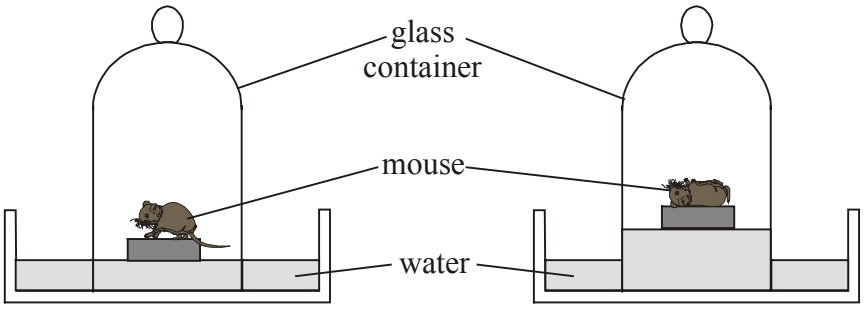
(c) John Mayow did experiments with air long before anyone knew what air was made of. In his first experiment he used a burning candle in a jar of air.

Leave blank



The candle continued to burn for a short time and then went out.
The water level rose in the jar showing that one fifth of the air had been used up.

In his second experiment he used a mouse in a similar jar of air.



The mouse died when one fifth of the air had been used up.

(i) Some people today think that John Mayow should not have carried out his second experiment. Suggest why.

.....

.....

(1)

(ii) What was it about John Mayow's results that made him think that it might be the same part of the air that was used by the candle and the mouse?

.....

(1)

(iii) John Mayow showed that it was the same part of the air that was used in both the experiments. Suggest how he did this.

.....

.....

(1)

(Total 8 marks)

3. (a) Complete the sentences using words from the box.

Leave blank

atom	**Compound**	**formula**	**metal**	**mixture**	**property**

An element contains only one type of .....

When elements combine, they form a .....

Iron combines with sulfur to form iron sulfide. Iron sulfide is not magnetic

because it has a different physical . . . . . to iron.

Iron sulfide is represented as FeS. This is its .....

(4)

(b) A lithium atom has a mass number of 7 and an atomic number of 3.
Draw a labelled diagram of this lithium atom.

(4)

(Total 8 marks)

Leave blank

4. (a) Water is a covalent compound formed when hydrogen burns.

Write the balanced equation for the burning of hydrogen.

.....

(3)

(b) A small piece of sodium is dropped into a large beaker of water.
It reacts to form sodium hydroxide solution and a gas.

(i) Describe **three** things you would see.

.....

.....

.....

.....

.....

.....

(3)

(ii) Give the name of the gas formed by this reaction.

.....

(1)

(iii) Use the periodic table provided to help you predict how the reaction of caesium with water would be different to the reaction of sodium with water.

.....

.....

(1)

Leave blank

(c) Sodium chloride is an ionic compound which dissolves in water.

(i) Explain why sodium chloride solution conducts electricity.

.....

.....

.....

.....

(2)

(ii) Explain why solid sodium chloride does not conduct electricity.

.....

.....

.....

.....

(2)

(Total 12 marks)

TOTAL 30 MARKS

END

Centre Number						Paper Reference	Surname	Initials
Candidate Number							Signature	

1536/2P 1539/2P

Edexcel GCSE

Science: Double Award B

[1536]

Paper 2P

Physics B

[1539]

Paper 2P

FOUNDATION TIER

Specimen Paper

Time: 30 minutes **N230900**

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Question Number	Leave Blank
1	
2	
3	
4	
Total	

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

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Information for Candidates

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This paper has 6 questions. There are no blank pages.

Advice to Candidates

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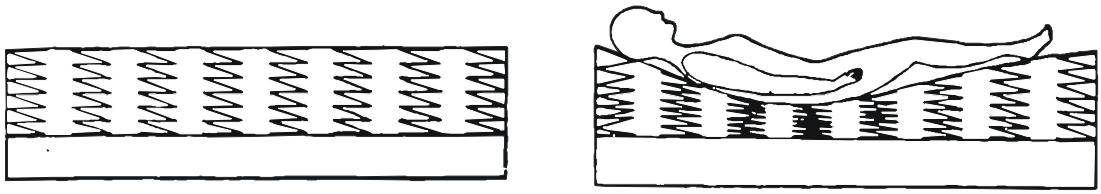
1. The mattress of a bed contains springs. The diagrams show the change that takes place when a person lies on the bed.

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 acting 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 downward pull of the Earth.
Another force acts on the person.

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

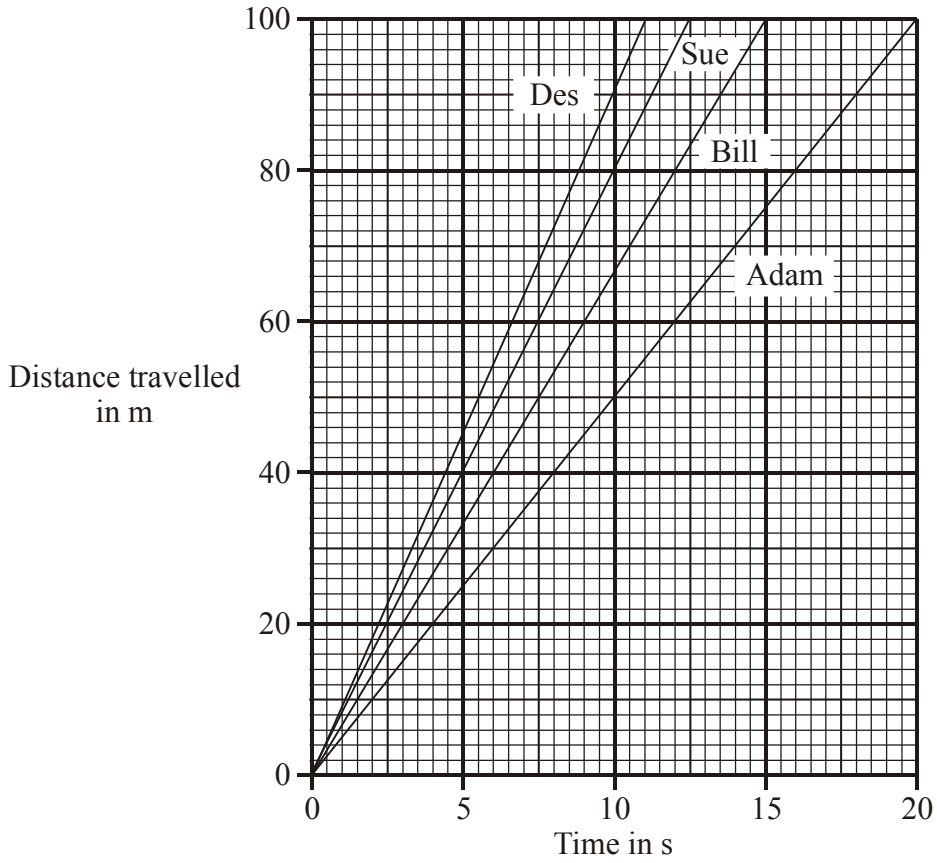
(1)

(Total 6 marks)

2. Four runners compete in a 100 m race.

Leave blank

The graph shows how the distance travelled by each runner changes with time.



(a) (i) Who won the race?

.....

(1)

(ii) Explain how you can tell.

.....

(1)

(b) (i) How long did it take Adam to run 100 m?

.....

(1)

(ii) What was Adam's speed during the race?

.....

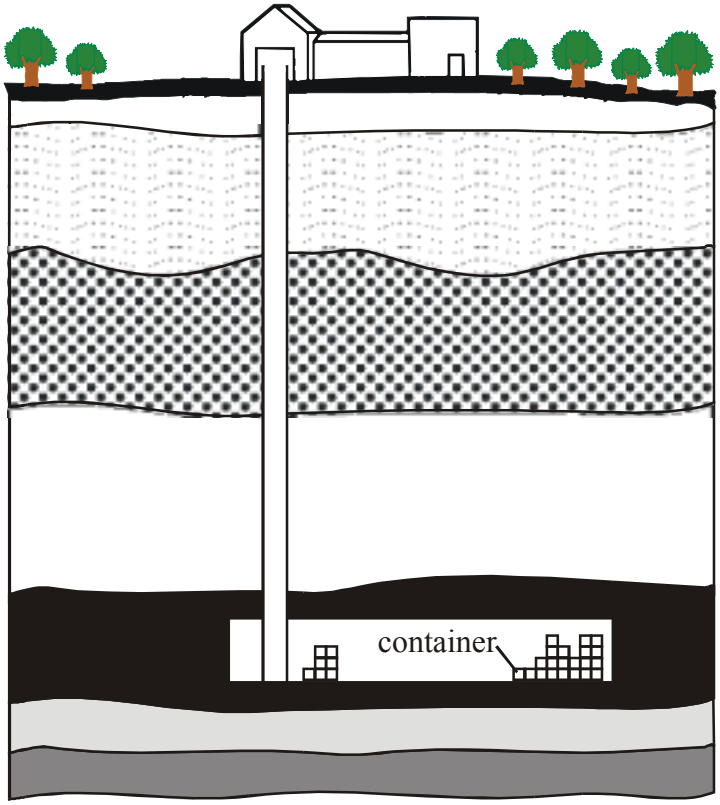
..... m/s

(3)

(Total 6 marks)

3. Nuclear power stations produce waste materials that are radioactive.
Rubber gloves and other items of protective clothing used in the nuclear power station are low level waste.
To dispose of them, they are sealed in glass inside corrosion-resistant metal containers.
The containers are then buried deep underground. This is shown in the diagram.

Leave blank



(a) Scientists think that the waste material is safe if there are three barriers separating it from people. The glass and the metal containers are two barriers.

What is the third barrier?

.....

(1)

(b) After 100 years, the waste material is thought to present no danger to people.
How does the activity of the waste change over a time span of 100 years?

.....

(1)

(c) How certain can scientists be that this method of disposal of radioactive waste materials is safe? Give reasons for your answer.

Leave blank

.....

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.....

.....

.....

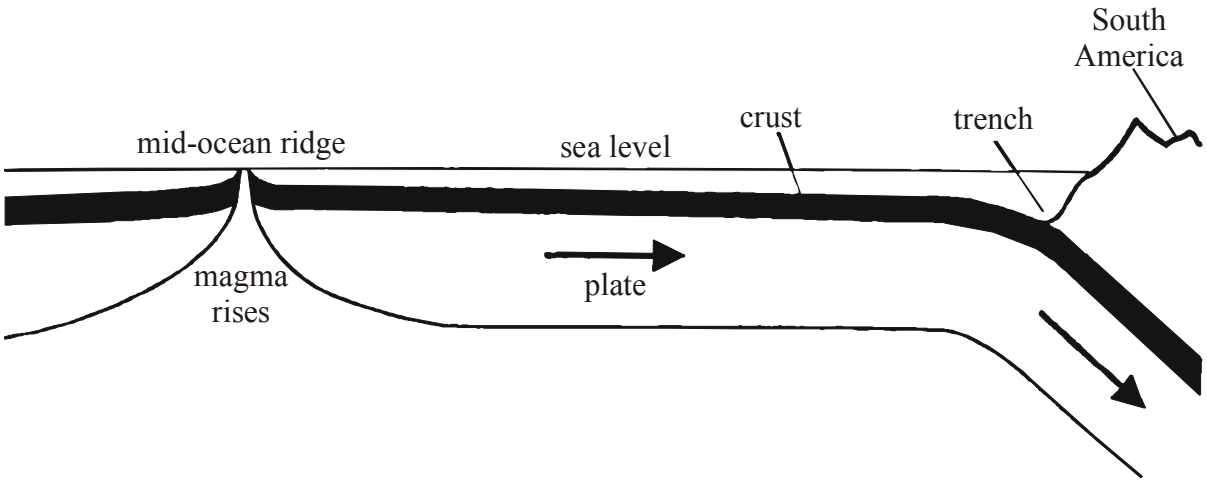
.....

(3)

(Total 5 marks)

4. The diagram shows plates under the Pacific Ocean.

Leave blank



(a) On the diagram write an **S** where molten rock is solidifying.

(1)

(b) What is causing new rocks to be made in this way?

.....

.....

.....

.....

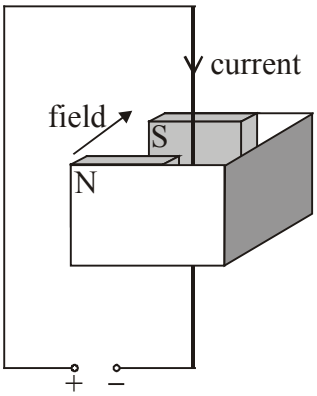
.....

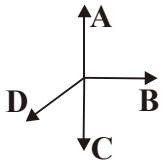
(3)

(Total 4 marks)

5. The diagram shows a metal wire placed in a magnetic field.

Leave blank



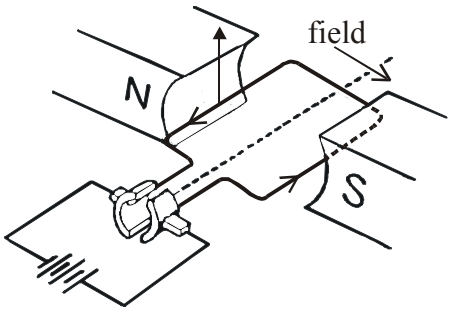


(a) Which arrow shows the direction of the magnetic force on the wire?

.....

(1)

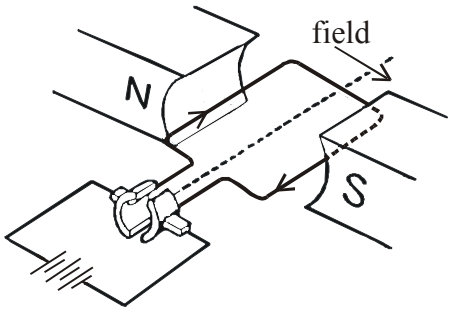
(b) In a d.c. motor, the forces on a coil of wire make it rotate.
The diagram shows a simple motor and the force acting on one side of the coil of wire.



Draw an arrow on the diagram to show the force acting on the right-hand side of the coil of wire.

(1)

(c) The current in the coil is reversed. Draw arrows on the diagram below to show the forces now acting on the sides of the coil of wire.

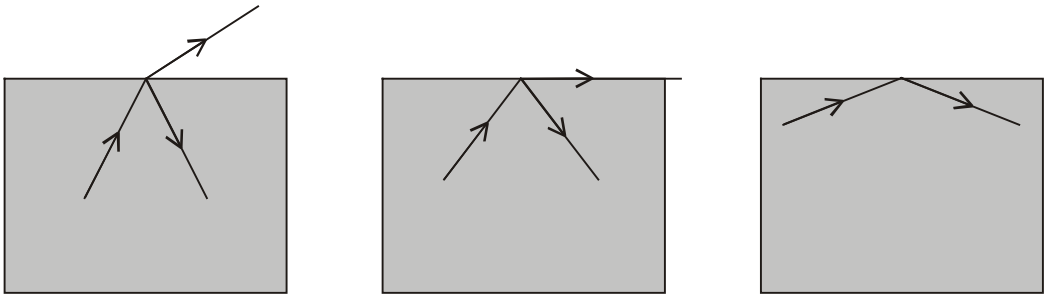


(2)

(Total 4 marks)

6. The diagrams show what happens when light meets a glass-air boundary at different angles of incidence.

Leave blank



A **B** **C**

(a) Describe what is happening to light in diagrams **A** and **C**.

.....

.....

.....

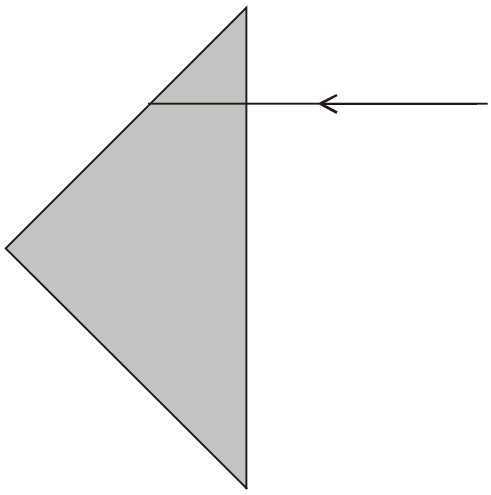
.....

.....

.....

(3)

(b) Complete the diagram to show how light passes through a prism in a cycle reflector.



(2)

(Total 5 marks)

TOTAL 30 MARKS

END

Paper Reference(s)

1529/03 1539/03 1549/03

Edexcel GCSE

GCSE Science B

Specimen Paper

Materials required for examination
None

Items included with question papers
None

Instructions to Candidates

In the boxes on each of the answer books, write your centre number, candidate number, surname and initials, the paper reference and your signature. If more than one paper reference is shown, you should write the one for which you have been entered.
Answer all questions in the spaces provided in the answer books.

Information for Candidates

The marks for the various parts of questions are shown in round brackets: e.g. (2).

Candidates entered for 1529 Biology B have one answer book to complete, Paper 3B. It should be completed in 30 minutes.
Candidates entered for 1539 Chemistry B have one answer book to complete, Paper 3C. It should be completed in 30 minutes.
Candidates entered for 1549 Physics B have one answer book to complete, Paper 3P. It should be completed in 30 minutes

Thus candidates entered for a single separate science will have 30 minutes of examining time, for two separate sciences, 1 hour, and for all three separate sciences, 1 hour 30 minutes.

Turn over

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Centre Number						Paper Reference	Surname	Initials
Candidate Number							Signature	

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1529/3B

Edexcel GCSE

Biology B [1529]
Paper 3B

FOUNDATION TIER
Specimen Paper

Time: 30 minutes **N230900**

Question Number	Leave Blank
1	
2	
3	
4	
5	
Total	

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

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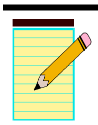
This paper has 5 questions. There are no blank pages.

Advice to Candidates



This symbol shows where the quality of your written answer will also be assessed.

This symbol shows where ideas and evidence are being assessed.

Additional Answer Sheets may be used.

Turn over

N230900

1. The table gives information about some diseases. Complete the table.

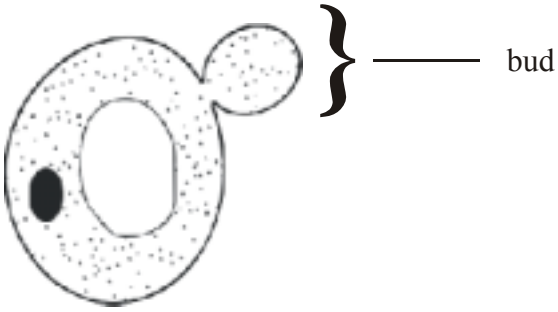
Leave blank

Disease	Type of organism causing the disease	How the organism is spread	Symptoms of the disease
Cholera	bacterium	……...	diarrhoea and dehydration
……	protozoan	by mosquito	shivering and fever
Influenza	……	by droplets in air	……

(4)

(Total 4 marks)

2. The diagram shows the fungus yeast, as seen through a microscope.



(a) Use the diagram to help you describe the reproduction of yeast cells.

……

……

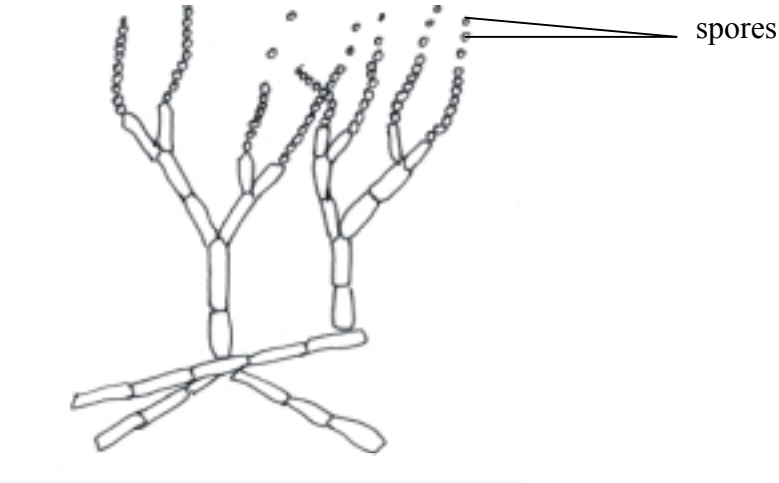
……

……

……

(3)

(b) The diagram shows the fungus *Penicillium*, as seen through a microscope, growing on agar jelly.



Leave blank

Give **one** way in which *Penicillium* is different from yeast.

.....

.....

(1)

(c) The spores produced by *Penicillium* have very low mass.

(i) What is the function of the spores?

.....

.....

(1)

(ii) What is the advantage of each spore having a low mass?

.....

.....

(1)

(Total 6 marks)

TURN OVER FOR QUESTION 3

3. Semen collected from a bull is diluted before storing to be used in artificial insemination.

Leave blank

(a) What is the advantage of diluting the semen?

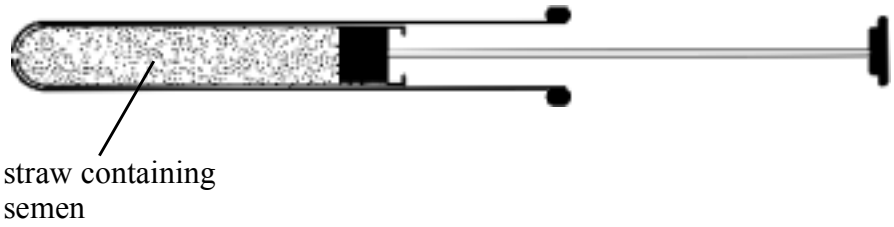
.....

.....

(1)

(b) The diagram shows a catheter, used in artificial insemination.

A straw containing semen is removed from storage, then inserted into the catheter just before insemination.



Where would the straw containing semen be stored?

.....

(1)

(c) Why is it necessary to warm the semen to body temperature before using it for the insemination?

.....

.....

.....

.....

(2)

(d) How does the semen from the catheter get into the cow?

Leave blank

.....

.....

(1)

(e) Why is it important that the semen is released at the cervix?

.....

.....

(1)

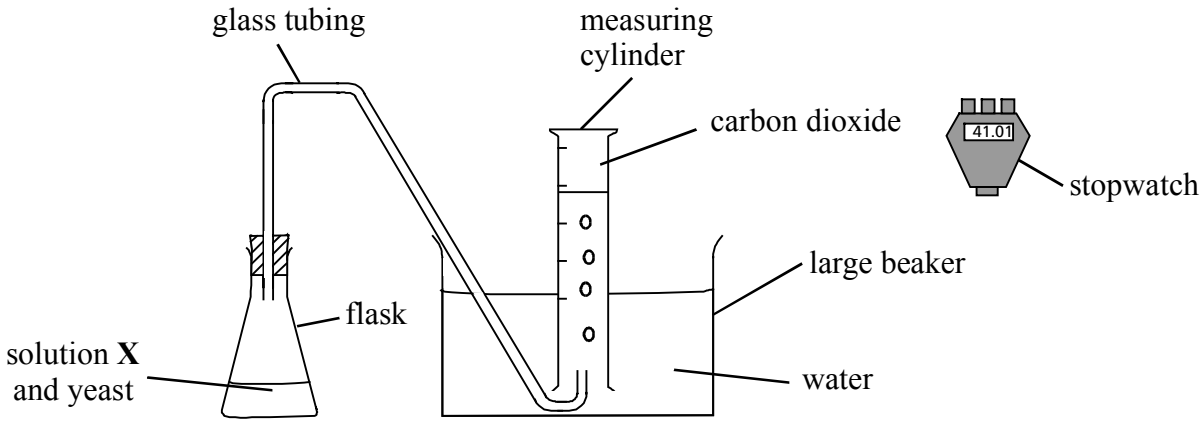
(Total 6 marks)

TURN OVER FOR QUESTION 4

Leave blank

4. Eric investigated the fermentation of solution **X** by yeast at different temperatures over a 24-hour period.

He used the apparatus shown below.



His results are shown on the table.

Temperature (±C)	**Volume of carbon dioxide collected in 24 hrs (cm^3)**			**Average volume of carbon dioxide collected in 24 hrs(cm^3)**
10	25	28	28	27
20	58	65	66	63
30	99	108	102	……..

(a) Calculate the average volume of carbon dioxide produced over 24 hours at 30±C.

Show your working.

Answer ……..……cm^3

(2)

(b) What is the advantage of calculating an average volume of carbon dioxide for each temperature?

.....

(1)

Leave blank

(c) What do Eric's results show about the relationship between temperature and the rate of fermentation?

.....

.....

(1)

(d) What would be the effect of a temperature of 0 ±C on the rate of fermentation?

Give a reason for your answer.

.....

.....

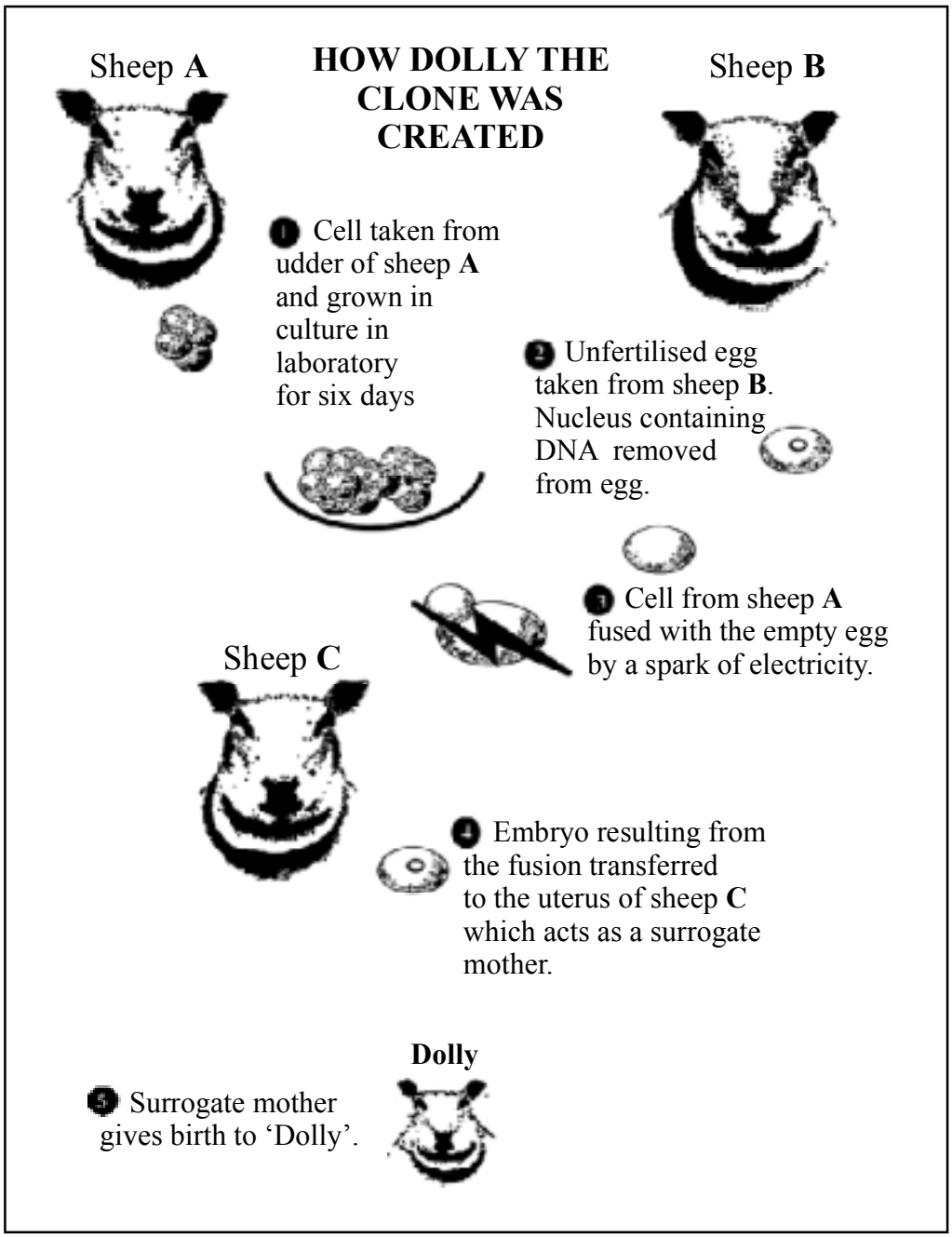
.....

(2)

(Total 6 marks)

5. The diagram shows how scientists produced Dolly the sheep.

Leave blank



(a) (i) Dolly was produced with the help of an unfertilised egg.
Where did the scientists get the DNA to put into this egg?

.....

(1)

(ii) Suggest why it was important to remove the DNA from the unfertilised egg.

.....

.....

(2)

(iii) Dolly is genetically identical to another sheep in the diagram. Which one?

.....

(1)

(b) Give **one** way in which this method is different from the normal method of sheep reproduction.

.....

.....

(1)

(c) The production of Dolly was a significant advance in scientific work. The work may result in animal clones being produced in large numbers.

Suggest why it is important that people are informed of new scientific advances.

.....

.....

.....

(2)

(d) Suggest **one** advantage of producing animal clones.

.....

.....

(1)

.....

(Total 8 marks)

TOTAL 30 MARKS

Leave blank

END

Centre Number						Paper Reference	Surname	Initials
Candidate Number						**1539/3C**	Signature	

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1539/3C

Edexcel GCSE

Chemistry B **[1539]**
Paper 3C

Question Number	Leave Blank
1	
2	
3	
4	
5	
Total	

FOUNDATION TIER
Specimen Paper

Time: 30 minutes **N230900**

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your signature, your surname and initials.

The paper reference is shown below the boxes.

Answer ALL questions in the spaces provided in this book.

Show all stages in any calculations and state the units. Calculators may be used.

Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

This paper has 5 questions. There are no blank pages.

Advice to Candidates

This symbol shows where the quality of your written answer will also be assessed.

This symbol shows where ideas and evidence are being assessed.

Additional Answer Sheets may be used.

Turn over

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THE PERIODIC TABLE

	Group 1	2											3	4	5	6	7	0
1	1 H Hydrogen 1																	4 He Helium 2
2	7 Li Lithium 3	9 Be Berylium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
3	23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
4	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	63.5 Cu Copper 29	65.4 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
5	85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	99 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
6	133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
7	223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

Key

Relative atomic mass
Symbol
Name
Atomic number

1. Two students made the insoluble salt, lead sulfate, and wrote these notes about the experiment.

Leave blank

> 'We took 25 cm^3 of lead nitrate solution and slowly added 25cm^3 of acid to it. The mixture turned cloudy white. We stirred the mixture and filtered it to obtain the solid lead sulfate.'

(a) Describe **one** safety precaution which the students should take during this experiment.

.....

.....

(1)

(b) (i) Which acid was added to lead nitrate solution to make lead sulfate?

A hydrochloric acid

B nitric acid

C sulfuric acid

Write the correct answer (**A**, **B**, or **C**) in the space provided.

.....

(1)

(ii) Draw, and name, a piece of apparatus that should be used to measure 25 cm^3 of the acid accurately.

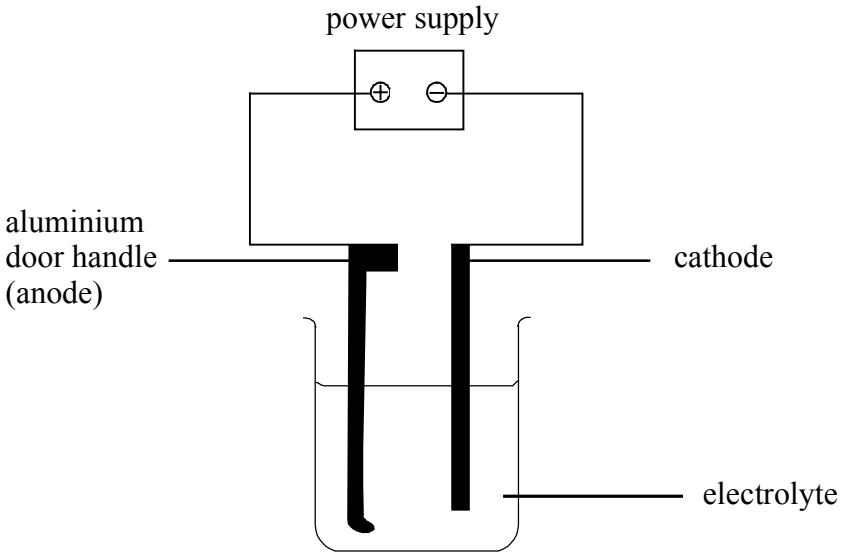
(2)

(Total 4 marks)

TURN OVER FOR QUESTION 2

2. A diagram of a simple experiment to anodise an aluminium door handle is shown below.

Leave blank



(a) Suggest **two** reasons for anodising aluminium objects.

1 .....

.....

2 .....

.....

(2)

(b) Complete the word equation for the reaction occurring when aluminium is anodised.

aluminium + oxygen ⟶ ……

(1)

(c) Name a suitable material for the cathode.

.....

(1)

(d) Name an electrolyte for this experiment.

.....

(1)

(Total 5 marks)

3. (a) Sulfuric acid is manufactured by the Contact process.

Leave blank

Use words from the box to complete the paragraph below.

Each word may be used once, more than once or not at all.

air	**Sulfur**	**sulfur dioxide**
sulfur trioxide	**Sulfuric acid**	**water**

The raw materials for the Contact process are …… and ……

They are heated together to form ……

More air and …… are then heated and passed over the catalyst.

The catalysed reaction produces ……

(5)

(b) State **two** uses of sulfuric acid.

1 .....

.....

2 .....

.....

(2)

(Total 7 marks)

4. (a) Complete the table which shows the tests for some ions in solution.

Leave blank

Name of ion in solution	Reagent added to the solution	Positive result
copper (II)	…… ……	light blue precipitate
……..	dilute nitric acid + silver nitrate solution	white precipitate
sulfate	……+ ……	…….. ……..

(5)

(b) Describe a test to show the presence of ammonium ions in ammonium chloride.

……

……

……

……

……

……

……

……

……

(5)

(Total 10 marks)

5. Outline a method for manufacturing ethanol.

Include raw materials and necessary reaction conditions.

Leave blank

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4)

(Total 4 marks)

TOTAL 30 MARKS

END

Centre Number						Paper Reference	Surname	Initials
Candidate Number						**1549/3P**	Signature	

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1549/3P

Edexcel GCSE

Physics B **[1549]**
Paper 3P

Question Number	Leave Blank
1	
2	
3	
4	
Total	

FOUNDATION TIER
Specimen Paper

Time: 30 minutes **N230900**

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

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Answer ALL questions in the spaces provided in this book.

Show all stages in any calculations and state the units. Calculators may be used.

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Information for Candidates

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This paper has 4 questions. There are no blank pages.

Advice to Candidates

This symbol shows where the quality of your written answer will also be assessed.

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Additional Answer Sheets may be used.

Turn over

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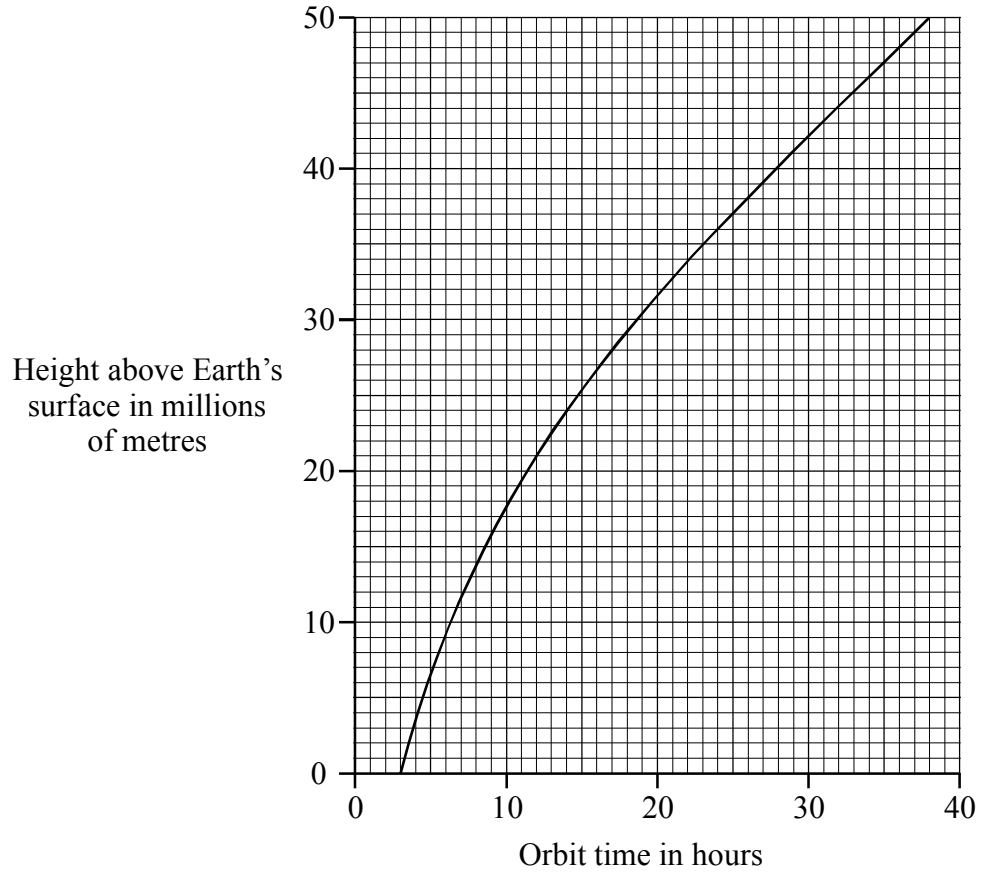
1. The graph shows how the orbit time of an artificial satellite depends on its height above the Earth's surface.

Leave blank



(a) How does the orbit time change with increasing height above the Earth's surface?

.....

(1)

(b) Some communications satellites are in geostationary orbit. They remain above the same point on the Earth's surface.

(i) Write down the orbit time of a geostationary satellite.

.....

(1)

(ii) Use the graph to find the height above the Earth's surface of a geostationary satellite.

.....

(2)

(iii) Describe **one** use of communications satellites that are in geostationary orbit.

Leave blank

.....

.....

(1)

(c) Over a period of time, a satellite in orbit around the Earth loses energy and slows down because of frictional forces acting on it.

Describe what is likely to happen to the satellite over a period of time.

.....

.....

.....

.....

.....

.....

.....

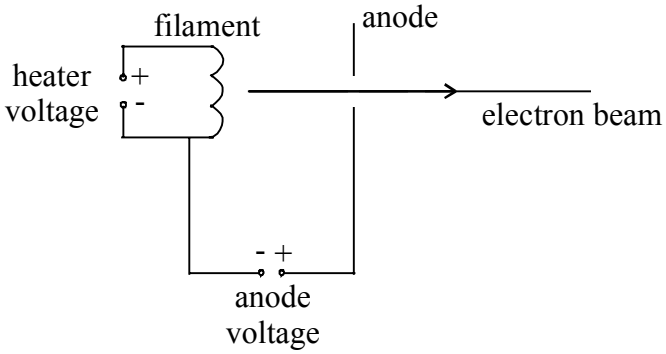
(3)

(Total 8 marks)

TURN OVER FOR QUESTION 2

Leave blank

2. (a) The diagram shows the basic construction of an electron gun.



(i) What is boiled off the hot metal filament?

.....

(1)

(ii) Use words from the box to complete the following sentences.

Anode	**attracted**	**cold**	**filament**	**hot**	**negative**	**positive**	**repelled**

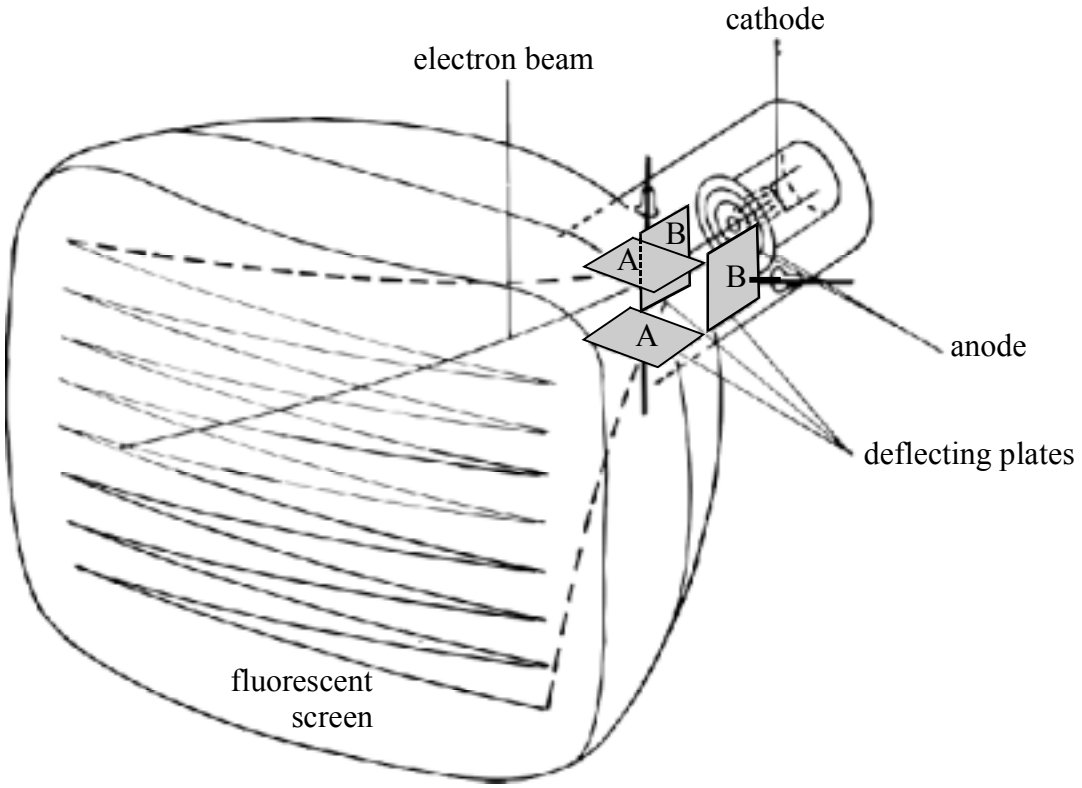
When the heater voltage is reversed, an electron beam is still produced. This is because the …….. still becomes …….. when a current is passed in it.

When the anode voltage is reversed, no electron beam is produced. This is because electrons are …….. and are …….. by the negative "anode".

(4)

(b) The diagram below shows a possible construction for a television tube and the path followed by the electron beam as it moves across the screen.

Leave blank



(i) Which pair of plates is used to deflect the electron beam from left to right across the screen?

.....

(1)

(ii) What type of energy is produced when the electron beam lands on the fluorescent screen?

.....

(1)

(iii) Describe **one** effect on the image produced on the screen when the number of electrons arriving is increased.

.....

.....

(1)

(Total 8 marks)

3. (a) Most telephone signals are sent through cables in the form of electrical signals. One disadvantage of this is that they can only travel a limited distance before they need to be amplified. A second disadvantage is that stray signals can affect the original signal.

Leave blank

(i) Explain why the electrical signals lose energy as they travel through the cable.

.....

.....

.....

.....

(2)

(ii) What is the function of the amplifier?

.....

(1)

(iii) When the stray signals are amplified, a 'hissing' is heard. What term is used to describe this type of signal distortion?

.....

(1)

(b) A signal can be sent through the cable in either digital or analogue form.

(i) Which method is used to avoid interference due to stray signals?

.....

(1)

(ii) Digital signals have an advantage over analogue signals since more information can be sent along the cable.
Explain this.

.....

.....

.....

.....

(2)

(c) Name the transducer used in the ear piece of the telephone used for converting the electrical signals received to sound.

.....

(1)

(Total 8 marks)

4. When air is pumped into a bicycle tyre the pressure inside the tyre increases. As more air is pumped in, it becomes increasingly difficult to push down the piston in the pump.

Leave blank

(a) Explain, in terms of air particles, how pressure is produced inside the tyre.

.....

.....

.....

.....

.....

.....

(4)

(b) Explain why the pressure in the tyre increases as more air is put in it.

.....

.....

.....

(2)

(Total 6 marks)

TOTAL 30 MARKS

END