

Friday 12 June 2015 – Afternoon

GCSE ADDITIONAL APPLIED SCIENCE

A191/02 Science in Society (Higher Tier)

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:

- Pencil
- Ruler (cm/mm)
- Calculator

Duration: 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- Your quality of written communication is assessed in questions marked with a pencil (✎).
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **50**.
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Martin is going to have an operation.

Before the operation, a nurse assesses Martin's health and fitness.

(a) She measures Martin's height and body mass (weight).

height 2 m

body mass 80 kg

(i) Use this formula to calculate Martin's Body Mass Index (BMI).

Show your working.

$$\text{BMI} = \frac{\text{body mass (kg)}}{[\text{height (m)}]^2}$$

BMI =[2]

(ii) Put a tick (✓) in the box next to the correct description of Martin's BMI.

- healthy weight
- obese
- underweight
- overweight

[1]

(b) The nurse measured Martin's height and body mass (weight).

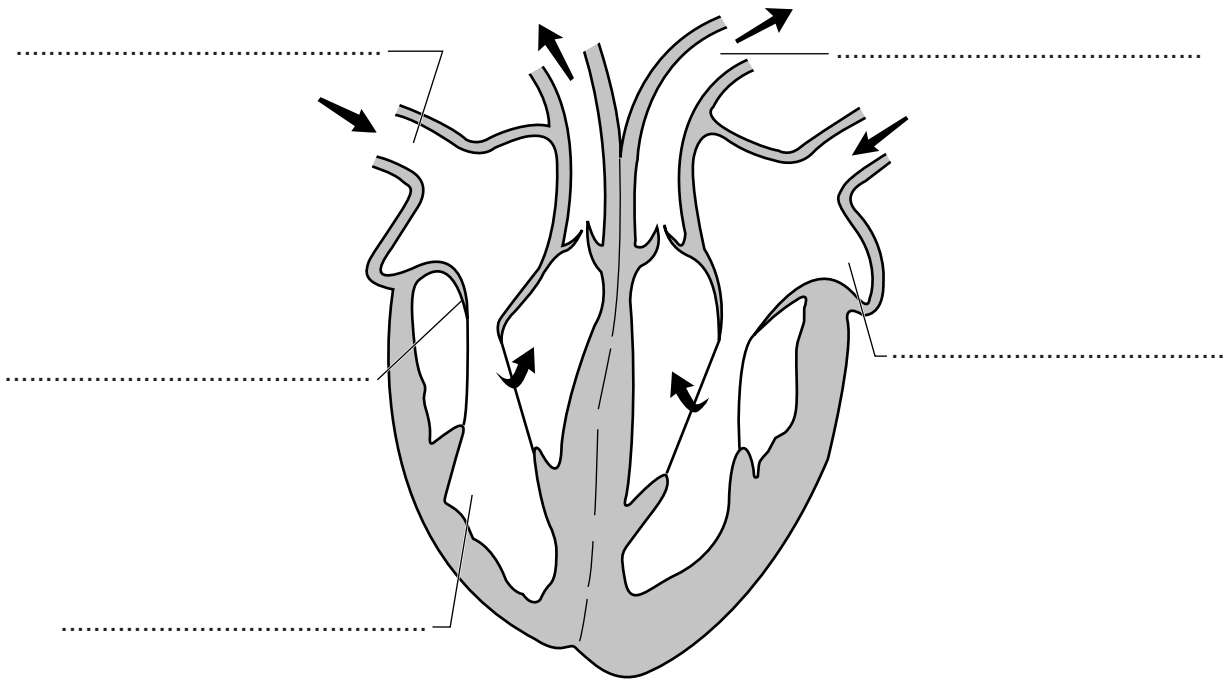
Write down **four other** pieces of information the nurse will need to collect about Martin.

- 1
- 2
- 3
- 4 [3]

[Total: 6]

2 The heart is an organ that pumps blood around the body.

(a) Complete the labelling of the heart.



Choose from the following labels.

artery atrium ventricle valve vein

[3]

(b) Explain how the structure of arteries, valves and veins are related to the jobs that they do.

artery

.....

valve

.....

vein

.....

[3]

(c) Oxygen, glucose, carbon dioxide and lactic acid are substances transported by the blood.

Identify which component of the blood transports each of these substances.

Put a tick (✓) in the **one** correct box in each row.

	Red blood cells	White blood cells	Plasma	Platelets
Oxygen				
Glucose				
Carbon dioxide				
Lactic acid				

[4]

[Total: 10]

3 This question is about health care.

(a) Write down examples of **two** local organisations that provide health care for the local community.

Explain what health care services each organisation provides.

1

2 [2]

(b) Describe the role of **two** different health care practitioners.

.....
.....
.....
..... [2]

(c) Suggest **two** other things that the NHS does.

.....
.....
.....
..... [2]

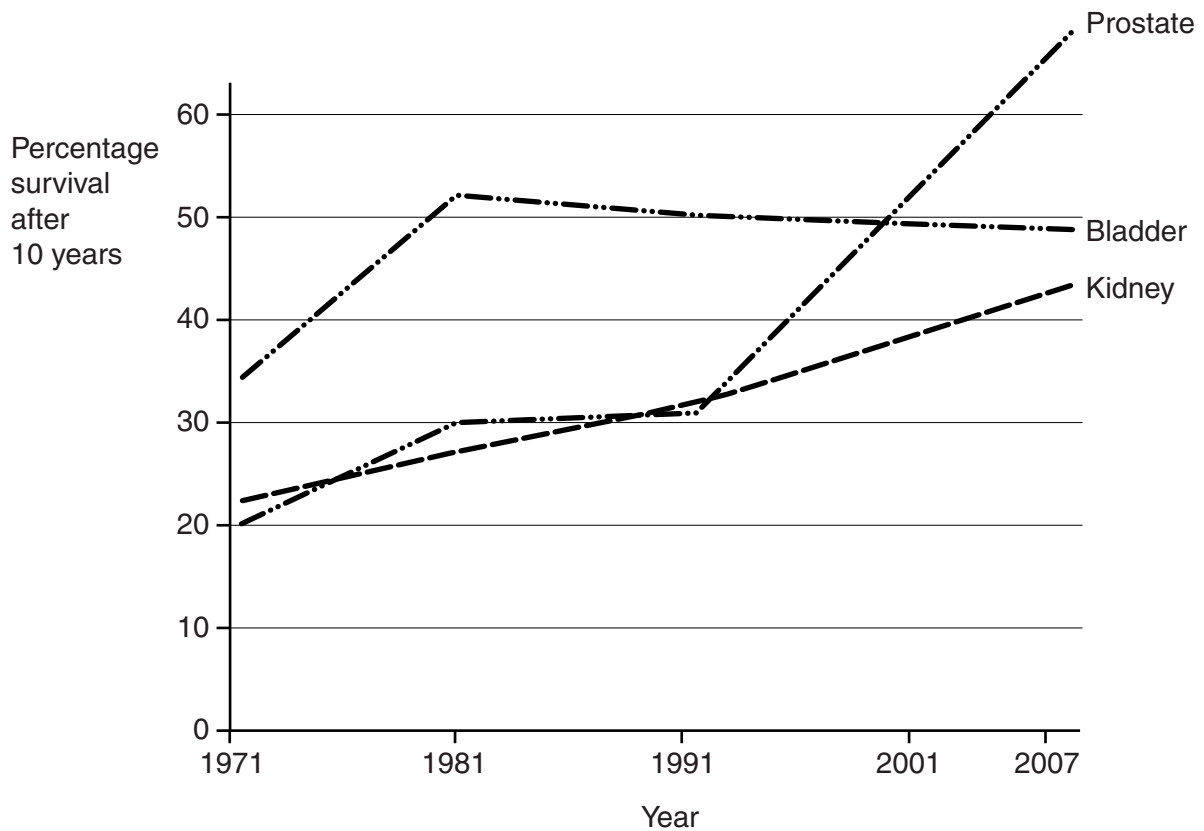
(d) All surgical and medical treatments carry some risk.

Barry has prostate cancer.

His doctor says he needs an operation.

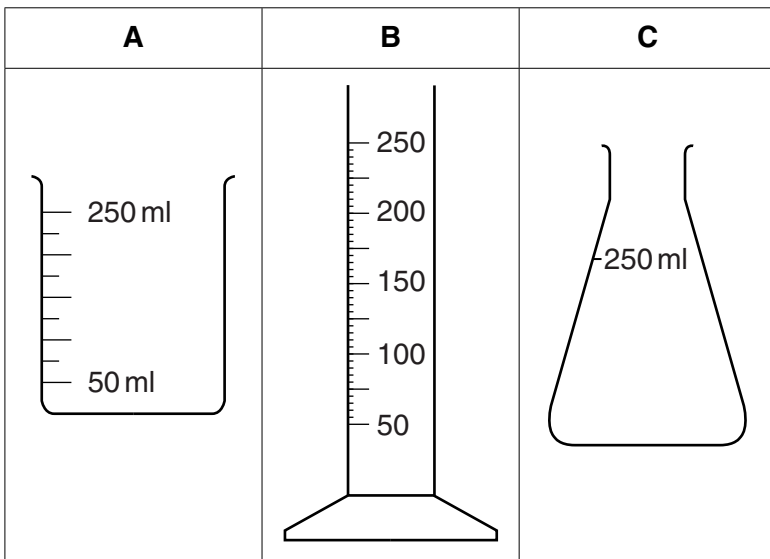
His doctor also shows Barry some data.

The graph shows how the percentage of patients surviving for 10 years after being diagnosed and treated for different types of cancer changed in the years 1971 to 2007.



5 Jason, Jane and Mary collect a sample of river water.

Jason selects one piece of equipment, **A**, **B** or **C**, and measures the volume of the water. He repeats the measurement two more times using the same piece of equipment.



	Volume of water (ml)		
Jason	145	144	146
Jane	142	147	144
Mary	130	150	150

Jane and Mary repeat the measurements using the same sample of water but each selects a different piece of equipment.

(a) For each student, Jason, Jane and Mary, suggest which piece of equipment each one used.

(i) Write **A**, **B** or **C** next to each name.

Jason	
-------	--

Jane	
------	--

Mary	
------	--

[2]

(ii) Justify your answer to part (i).

.....

.....

..... [2]

(b) Each measurement of the same sample can produce a different result. This is because of **random** and **systematic** error.

Explain what is meant by random error and systematic error.

.....

.....

.....

..... [2]

[Total: 6]

(b) There are some disadvantages of using an electron microscope to produce images.

Describe **two disadvantages** of using an electron microscope to produce an image.

.....
.....
.....
..... [2]

(c) Images are also produced when using chromatography.

Which of these statements are differences between electron micrographs and chromatograms?

Put a tick (✓) next to the **two correct** answers.

Electron micrographs do not magnify. Chromatograms do.

Electron micrographs do not last very long. Chromatograms do.

Chromatograms do not produce Rf values. Electron micrographs do.

Electron micrographs do not separate substances. Chromatograms do.

Chromatograms do not depend upon colours. Electron micrographs do.

Chromatograms cannot have a depth of field. Electron micrographs can.

Chromatograms are always 1-way. Electron micrographs can be 2-way.

[2]

[Total: 10]

END OF QUESTION PAPER

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