



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



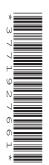
Candidate forename						Candidate surname			
Centre numb	oer					Candidate number			

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.

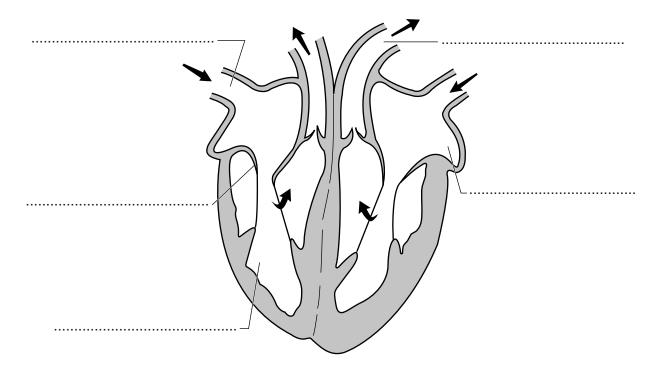
Ма	rtin is	s going to have an operation.		
Bef	ore t	ne operation, a nurse assesses	Martin's health and fitness.	
(a)	She	e measures Martin's height and	body mass (weight).	
		height 2 m	body mass 80 kg	
	(i)	Use this formula to calculate N	Martin's Body Mass Index (BMI).	
		Show your working.		
		ВМІ	$= \frac{\text{body mass (kg)}}{[\text{height (m)}]^2}$	
			BMI =	[2]
	(ii)	Put a tick (✓) in the box next to	o the correct description of Martin's BMI.	
		healthy weight		
		obese		
		underweight		
		overweight		
				[1]
(b)	The	e nurse measured Martin's heig	ht and body mass (weight).	
	Wri	te down four other pieces of in	formation the nurse will need to collect about Martin.	
	1			
	2			
	3			
	4			[3]

[Total: 6]

1

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

		[3]
(b)	Explain how the structure of arteries, valves and veins are related to the jobs that they do.	
	artery	
	valve	
	vein	
		 [3]

ventricle

valve

vein

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(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 (\checkmark) 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]

Ihis	s question is about health care.
(a)	Write down examples of two local organisations that provide health care for the loca 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.
	ro:

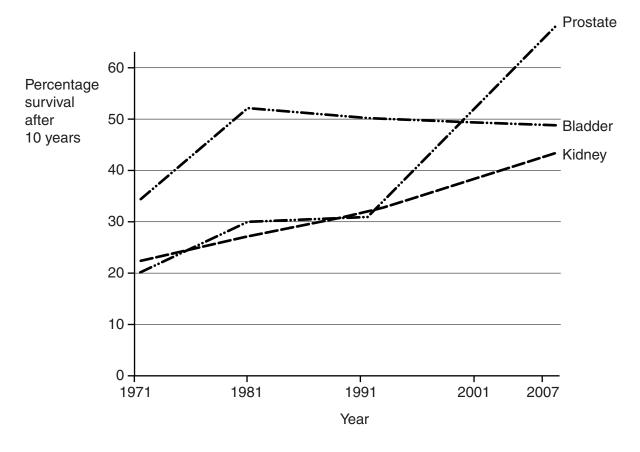
(d) All surgical and medical treatments carry some risk.

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.



His doctor tells him that there is less than a 1% risk of death during the operation.

The operation will not be done on a Friday as there is an 85% increase in risk if the operation is done on a Friday.

Explain why Barry needs to be informed of these risks. Use **all of the information** provided to discuss both the risks and benefits to Barry of either deciding to have or not to have the operation.

Th	e quality of writt	en communicatio	n will be assess	sed in your answer.	
					[Total: 12]

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4 This question is about the need for scientific evidence.

A Scene Of Crime Officer (SOCO) goes to a crime scene.

There was a violent fight and two people are dead.

There is a lot of blood on the ground.

Describe how the SOCO will collect, prepare and store samples of blood and how these samples could be analysed back in the lab.

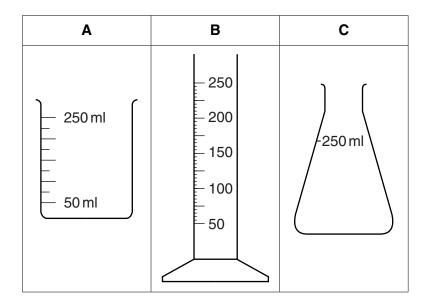
Explain the reasons for each stage of the process.

The quality of written communication will be assessed in your answer.
[6]
[6]

[Total: 6]

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 answe	er to part (i)) .					L e .
									 [2
(b)	Each measurement of the same sample can produce a different result. This is because of random and systematic error.								[∠.
	Explain wha	at is meant	by random	error and	systemation	c error.			

[Total: 6]

.....[2]

6	Reshma	sees a	drawing	of an	unidentified	pollen	arain.
•			G. G	0. 0		P C C	9. ~

1-1	01	and the second second						11
(a)	She compares th	ne drawind v	wiin an	electron	micrograph	imade oi	a sumilower	r bollen arain

(a)	She compares t	ne drawing with an electron micrograph image of a sunflower pollen grain.								
	drawing of unidentified pollen grain	electron micrograph of a sunflower pollen grain								
H	× 900	× 1200								
	Reshma concludes that the unidentified pollen grain was from a sunflower.									
	Comment on Re	shma's conclusion.								
	Describe any ev	idence that supports or contradicts her conclusion.								
Ø	The quality	of written communication will be assessed in your answer.								

.....

.....[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 ima	ge.
(c)	Images are also produced when using chromatography.	[2]
` '	Which of these statements are differences between electron micrographs and chron	natograms?
	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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