

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**GCSE**

**A191/02**

**ADDITIONAL APPLIED SCIENCE**  
**Science in Society (Higher Tier)**

**THURSDAY 12 JUNE 2014: Morning**

**DURATION: 1 hour**  
**plus your additional time allowance**

**MODIFIED ENLARGED**

<b>Candidate forename</b>		<b>Candidate surname</b>	
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<b>Centre number</b>						<b>Candidate number</b>				
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**Candidates answer on the Question Paper.**  
**A calculator may be used for this paper.**

**OCR SUPPLIED MATERIALS:**

**Sheet A: Growth Chart for Question 3(b)**

**OTHER MATERIALS REQUIRED:**

**Pencil**  
**Ruler (cm/mm)**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

**Write your name, centre number and candidate number in the boxes on the front page. 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).**

## **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.**

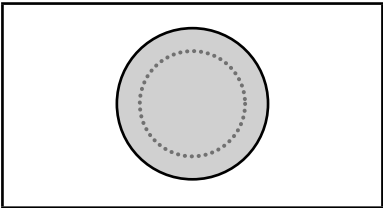
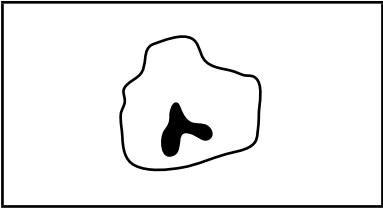
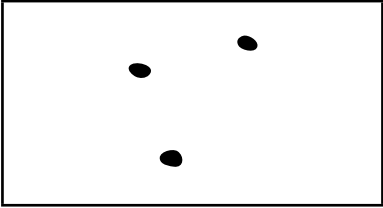
**Any blank pages are indicated.**

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**Answer ALL the questions.**

- 1 Blood is important to human beings.  
It has several components.**

**(a) Draw one straight line from each COMPONENT  
to its correct NAME. Then draw one more straight  
line from each NAME to the explanation of WHAT  
IT DOES.**

<b>COMPONENT</b>	<b>NAME</b>	<b>WHAT IT DOES</b>
	<b>platelet</b>	<b>clots blood</b>
	<b>white blood cell</b>	<b>carries oxygen</b>
	<b>red blood cell</b>	<b>kills invading bacteria</b>

**[2]**

**(b) Our blood system helps to control our body temperature.**

**Explain what happens to prevent our body temperature from rising when our environment gets too hot.**

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**[3]**

**[TOTAL: 5]**

**Describe and explain the whole process that the fitness trainer will perform.  
Give examples of good practice in your answer.**



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[6]

# 6

**3 Babies are assessed using the APGAR score and growth charts.**

**Look at the data collected for baby Jane and then answer the following questions.**

**When born, baby Jane's body was mostly pink but she had pale fingers.**

**Her pulse rate was 95 beats per minute.**

**When picked up by a stranger she would cry and try to pull away.**

**Baby Jane's joints were bendy but did not resist when an attempt was made to straighten them.**

**Her breathing was weak and irregular.**

**Baby Jane's mass at 2 weeks was 3 kg.**

**After 22 weeks baby Jane's mass was 7 kg.**

**(a) A student used this table to calculate the baby's APGAR score.**

<b>Observations</b>	<b>scores 0</b>	<b>scores 1</b>	<b>scores 2</b>
<b>Appearance</b>	<b>blue or pale all over</b>	<b>pink body but pale or blue fingers</b>	<b>pink all over</b>
<b>Pulse</b>	<b>0</b>	<b>less than 100</b>	<b>100 or more</b>
<b>Grimace</b>	<b>no response to stimulation</b>	<b>feeble grimace or cry when stimulated</b>	<b>cry or pull away when stimulated</b>
<b>Activity</b>	<b>no bending of joints</b>	<b>some bending of joints</b>	<b>bending of joints that resists straightening</b>
<b>Respiration</b>	<b>no breathing</b>	<b>weak irregular breathing</b>	<b>strong deep regular breathing</b>



- (i) The student gave a score of 1 for each observation and calculated that baby Jane's APGAR score was 5.  
The student was wrong.  
Calculate baby Jane's correct APGAR score and identify where the student went wrong.

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[2]

- (ii) Use this table of APGAR scores below to determine the state of baby Jane's condition.

<5	in need of emergency medical attention
5–7	needs careful monitoring
>7	no cause for concern

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[1]

- (b) Use the data about baby Jane and the growth chart, on Sheet A to comment on baby Jane's growth progress over the first 22 weeks.

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[2]

[TOTAL: 5]

- 4 Students in school studying science sometimes use light microscopes.**

**Scientists in universities doing research sometimes use electron microscopes.**

**Look at the two images, A AND B, of a small fly.**

**IMAGE A**  
**whole fly**



**IMAGE B**  
**part of fly's eye**



**Describe and explain the advantages and disadvantages of using both types of microscope.**



**The quality of written communication will be assessed in your answer.**

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**[6]**

**[TOTAL: 6]**

**5 Wendy goes on a field trip.**

**She needs to measure a 5m square of grassland in order to count the different plants in the piece of grassland.**

**These are her notes.**

**Our teacher did not bring enough tape measures.**

**I had to make my own. I measured and cut a piece of string one metre long.**

**I then measured my 5m square by laying the string on the ground five times for each side of the square.**

**(a) When she gets back to the classroom, different students comment on Wendy's method.**

**PETER**

**'If Wendy measured the same piece of land with the same piece of string she would get different results each time.'**

**RAFI**

**'If I measured the same piece of land with the same piece of string I would get different results to Wendy.'**

## **JANE**

**‘Wendy would have got a result closer to the true value if she had used a steel tape measure rather than a piece of string.’**

## **STELLA**

**‘The piece of string may not have been exactly 1 metre long. If she repeated the measurements several times her results would all be similar, but wrong.’**

- (i) Which person, PETER, RAFI, JANE or STELLA, best describes ACCURACY?**

\_\_\_\_\_ [1]

- (ii) Which person, PETER, RAFI, JANE or STELLA, best describes REPRODUCIBILITY?**

\_\_\_\_\_ [1]

- (iii) Which person, PETER, RAFI, JANE or STELLA, best describes PRECISION?**

\_\_\_\_\_ [1]

- (iv) Which person, PETER, RAFI, JANE or STELLA, best describes REPEATABILITY?**

\_\_\_\_\_ [1]

- (b) Wendy calculated the area of her piece of land by multiplying her two 5 m sides together. She calculated the area as 25 m<sup>2</sup>.**

**Wendy's calculation of the area had a greater uncertainty than her measurements of her two 5 m sides.**

**Explain why.**

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**[2]**

- (c) Wendy's measurements contained both RANDOM and SYSTEMATIC errors.**

**Explain the meaning of these two terms by referring to Wendy's method.**

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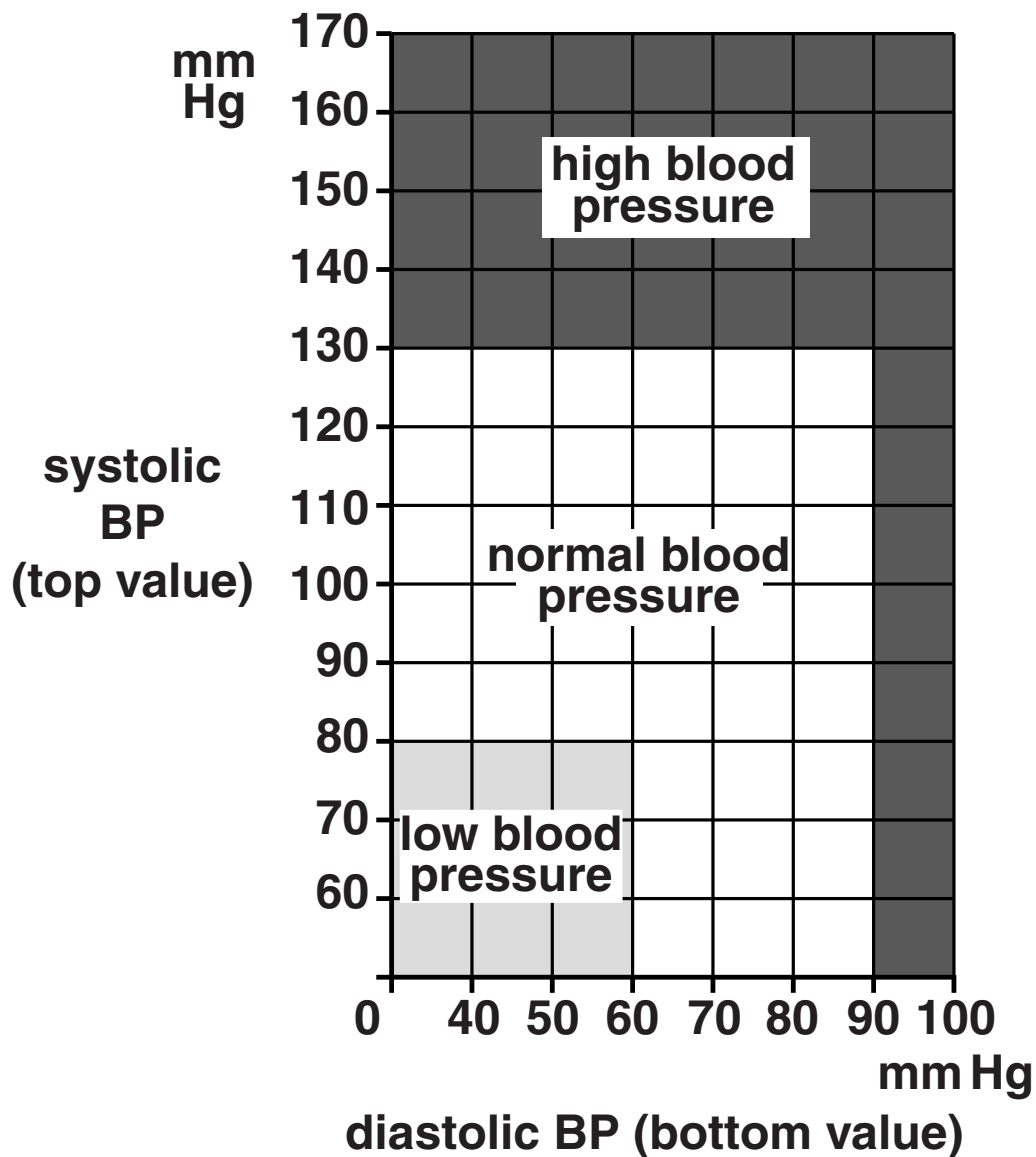
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**[2]**

**[TOTAL: 8]**

- 6 Jason has his blood pressure measured each year by his doctor.  
His doctor tells him that his latest blood pressure reading is 128/87.

(a) Jason uses this chart to find the state of his blood pressure.



Write down the state of Jason's blood pressure.

\_\_\_\_\_

[1]

- (b) The bar chart opposite shows Jason's blood pressure readings for the last four years. Complete the chart by drawing the bars for Jason's latest reading of 128/87. [2]
- (c) The doctor explains that Jason should be concerned about his blood pressure readings.

Use data from the charts in parts (a) AND (b) to suggest why Jason should be concerned.

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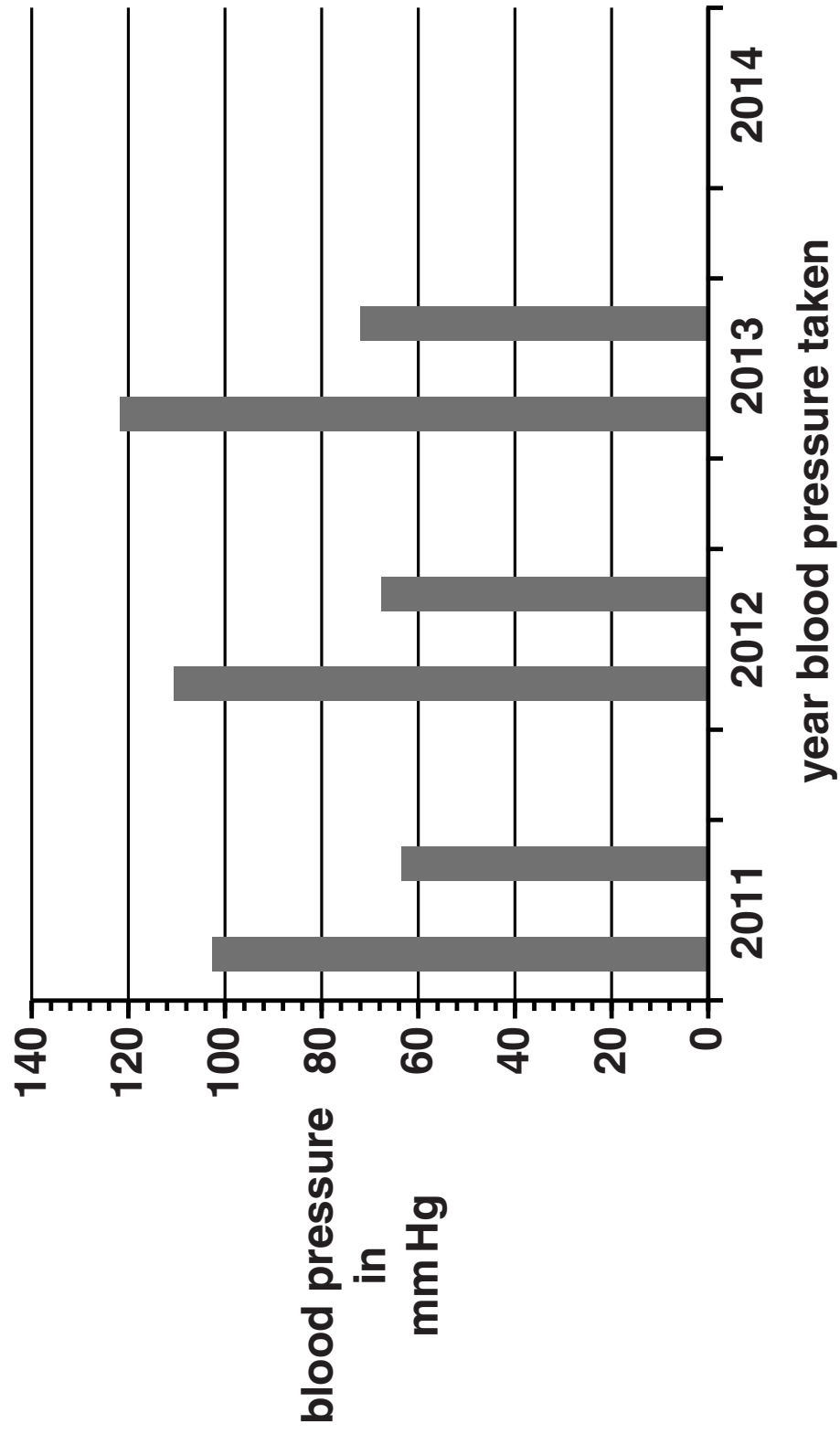
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[2]

[TOTAL: 5]





- 7 Paper chromatography is a useful technique for analysing unknown mixtures.**

**Describe in detail how you would SET UP AND USE paper chromatography to find out if a banned food dye had been used in a bottle of fruit juice.**

**You may use the blank space for a diagram.**



**The quality of written communication will be assessed in your answer.**

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[6]

[TOTAL: 6]

**8 Jasmine is a food scientist.  
She uses a colourimeter to analyse drink samples.**

- (a) She wants to know the concentration of a food dye that has been added to a fruit drink.**

**Explain how Jasmine would use a colourimeter to find the concentration of the dye in the fruit drink.**

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**[4]**

- (b) Which of these words best describes the results obtained by using a colourimeter?  
Put a tick (✓) in the box next to the best answer.**

<b>qualitative</b>	
<b>semi-qualitative</b>	
<b>quantitative</b>	
<b>semi-quantitative</b>	

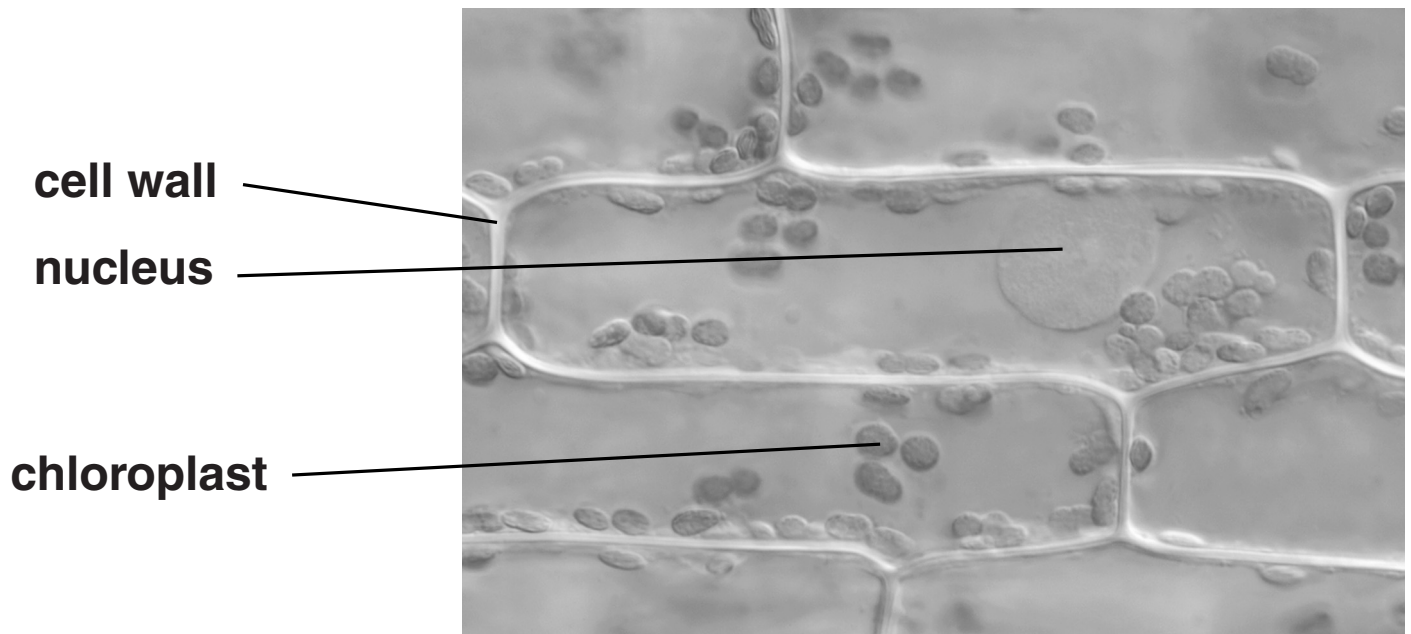
**[1]**

**[TOTAL: 5]**

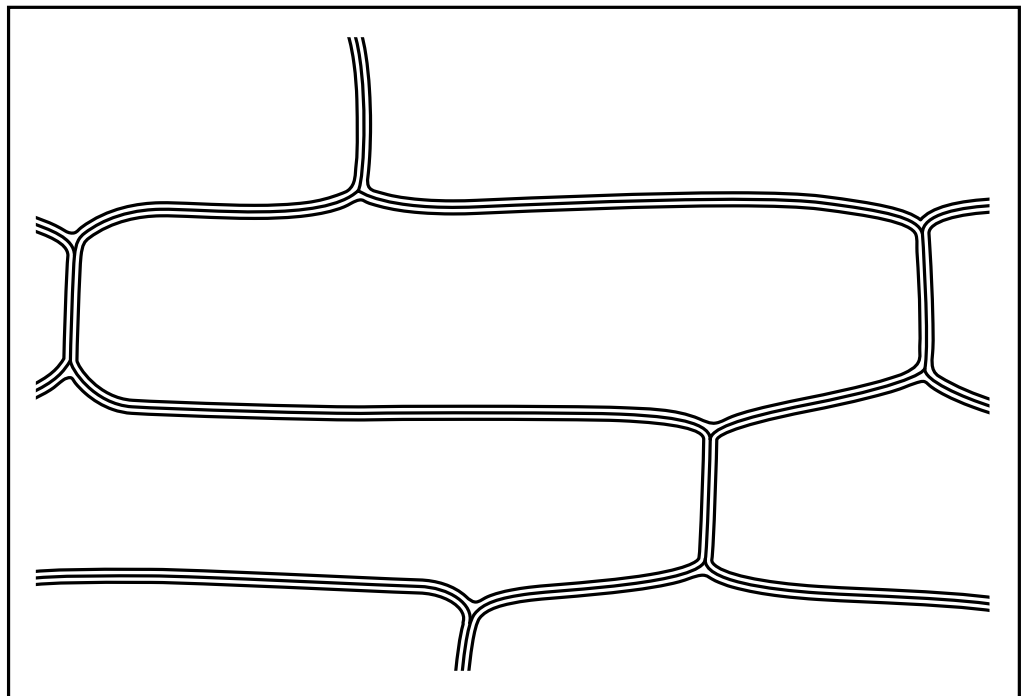
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- 9 Michael looked at leaf cells in a photograph from a light microscope.  
He then made a drawing of what he saw.

**THIS IS WHAT HE SAW.**



**THIS IS WHAT HE DREW.**



- (a) Write down TWO different features in the photograph that Michael did NOT show in his drawing.**

\_\_\_\_\_

\_\_\_\_\_ [2]

- (b) Estimate the scale that Michael used for his drawing compared to the photograph. Justify your answer.**

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\_\_\_\_\_

\_\_\_\_\_ [2]

**[TOTAL: 4]**

**END OF QUESTION PAPER**



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