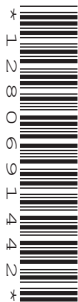


Thursday 12 June 2014 – Morning

GCSE ADDITIONAL APPLIED SCIENCE

A191/02 Science in Society (Higher Tier)



Candidates answer on the Question Paper.
A calculator may be used for this paper.

OCR supplied materials:
None

Other materials required:

- Pencil
- Ruler (cm/mm)

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.

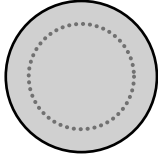

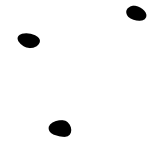
INFORMATION FOR CANDIDATES

- 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 **16** pages. Any blank pages are indicated.

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**.

component	name	what it does
	<p>platelet</p>	<p>clots blood</p>
	<p>white blood cell</p>	<p>carries oxygen</p>
	<p>red blood cell</p>	<p>kills invading bacteria</p>

[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.

.....

.....

.....

.....

..... [3]

[Total: 5]

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.

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

(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.

.....

.....

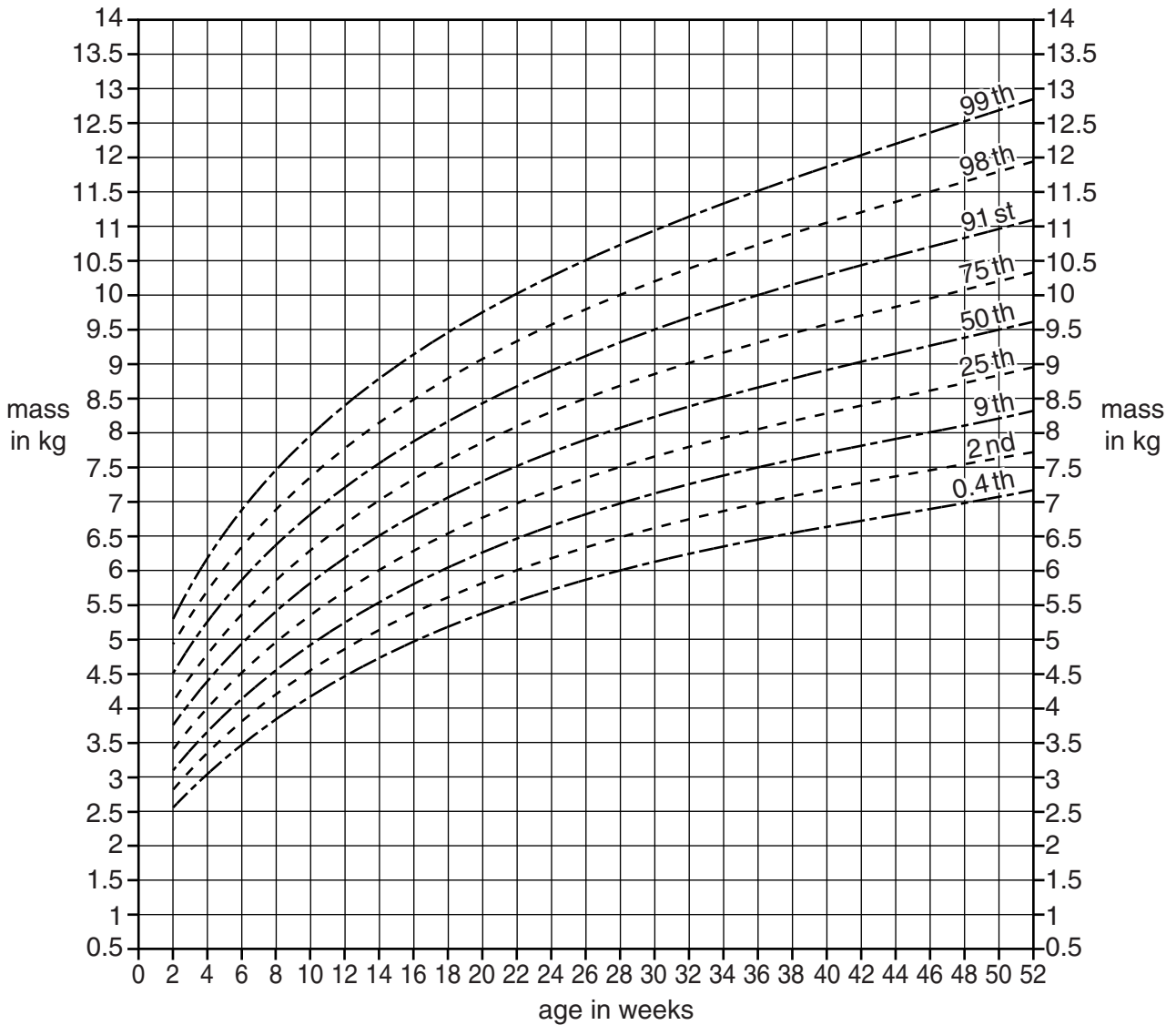
..... [2]

(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

..... [1]

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



.....

 [2]

[Total: 5]

Turn over

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PLEASE DO NOT WRITE ON THIS PAGE

5 Wendy goes on a field trip.

She needs to measure a 5 m 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 5 m 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.

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



Peter

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



Rafi

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.



Jane

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.



Stella

(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 m².

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

Explain why.

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

(c) Wendy's measurements contained both **random** and **systematic** errors.

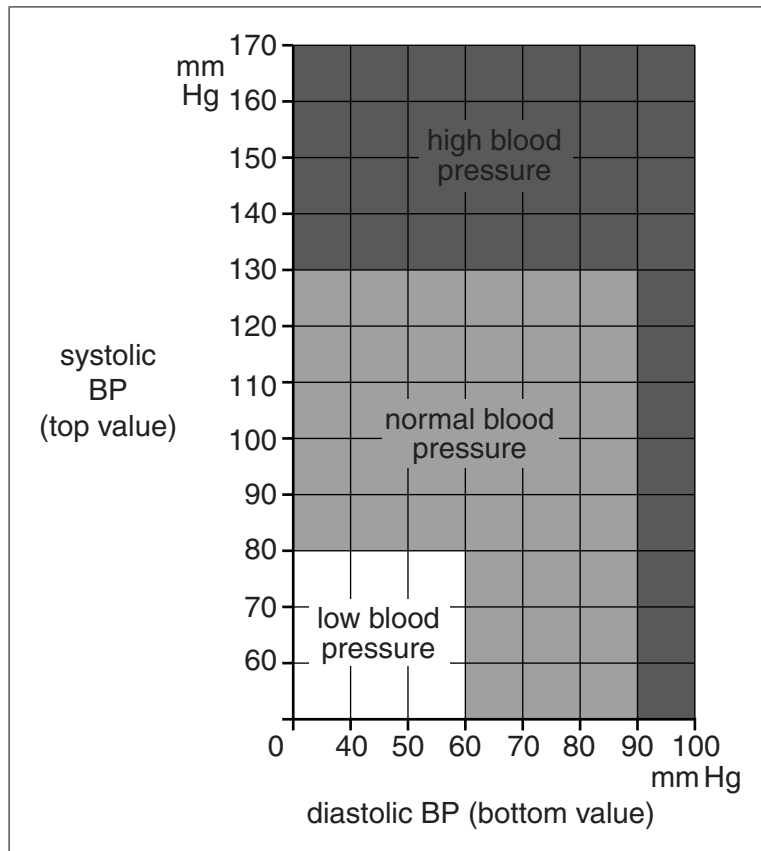
Explain the meaning of these two terms by referring to Wendy's method.

.....
.....
.....
..... [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.

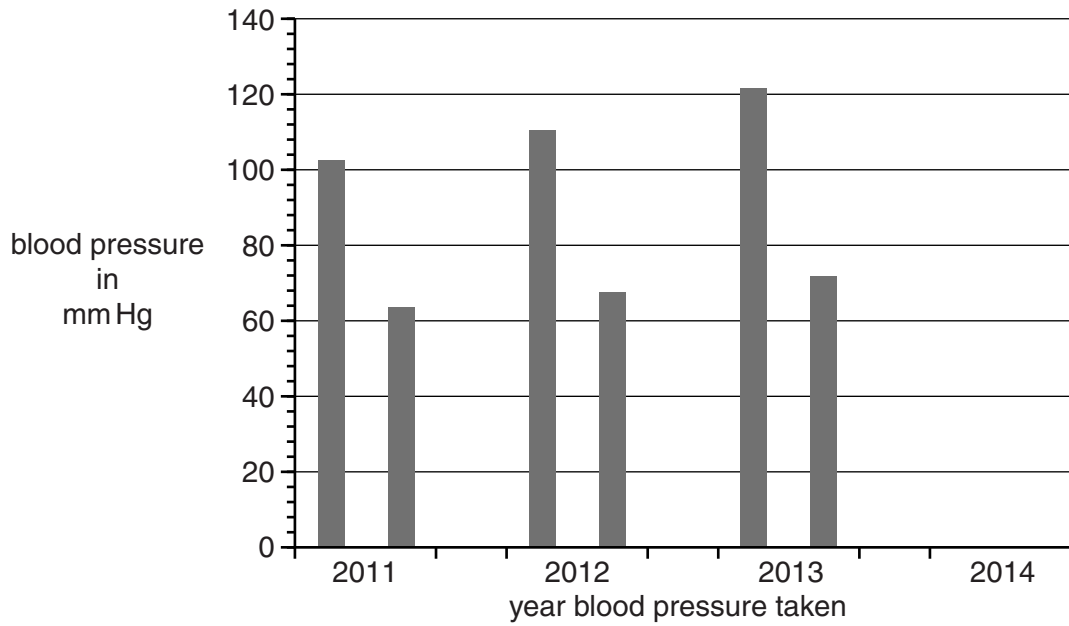


Write down the state of Jason's blood pressure.

.....

[1]

- (b) The bar chart 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.

.....

.....

..... [2]

[Total: 5]

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.

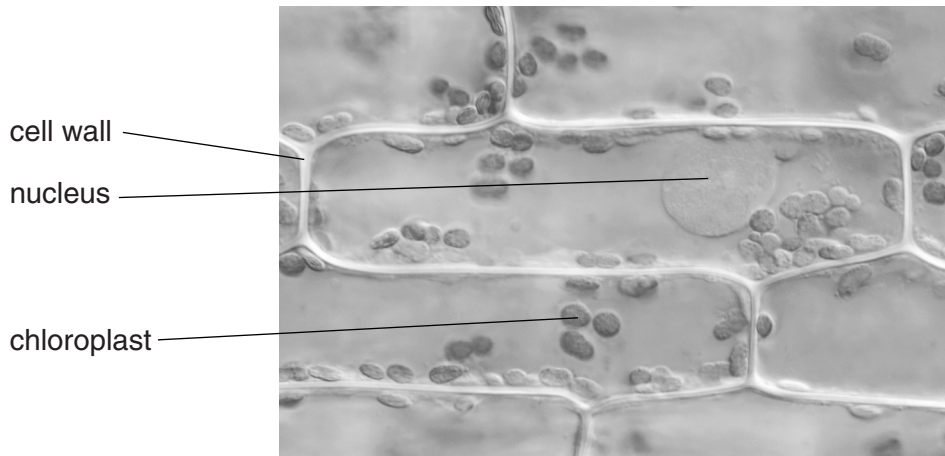
qualitative	
semi-qualitative	
quantitative	
semi-quantitative	

[1]

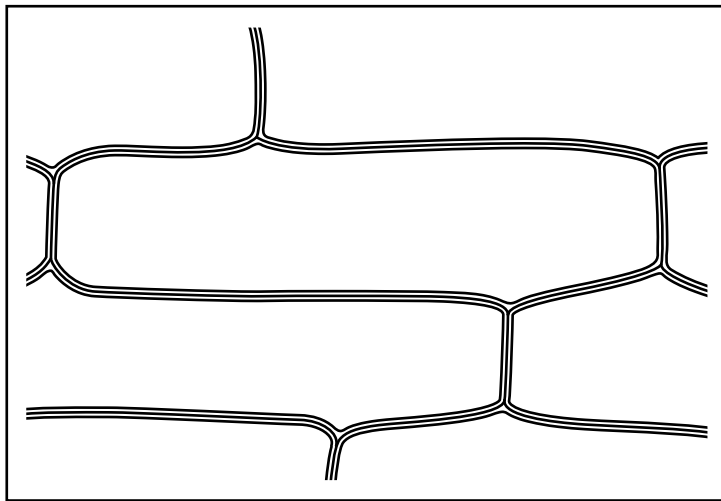
[Total: 5]

- 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.

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

[Total: 4]

END OF QUESTION PAPER

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