

**Friday 17 June 2016 – Morning**

**GCSE ADDITIONAL APPLIED SCIENCE**

**A191/02 Science in Society (Higher Tier)**

Candidates answer on the Question Paper.

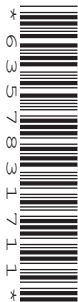
**OCR supplied materials:**

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. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- 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 Jason wants to improve his fitness.

(a) Jason asks his doctor for a health check before he starts his fitness training.

(i) The doctor takes a sample of Jason's blood.

Write down **three** components of Jason's blood and describe the job each component does.

- 1 .....
- .....
- 2 .....
- .....
- 3 .....
- .....

[3]

(ii) The doctor tests Jason's joints.

Write down **three** different parts of a joint and describe the job that each part does.

- 1 .....
- .....
- 2 .....
- .....
- 3 .....
- .....

[3]

(iii) Write about **two** other organs that the doctor needs to check before Jason starts his fitness training.

Explain the reason for your choice.

- .....
- .....
- .....
- .....

[2]

(b) Jason’s fitness trainer wants to know how fast Jason can run.  
 Jason runs at 5 metres per second.  
 Calculate how long it takes for Jason to run 100m.

time = ..... s [2]

(c) Jason has an injury during training. His fitness trainer refers him to a physiotherapist.  
 It is important that fitness trainers and physiotherapists develop elements of good practice.  
 Describe the jobs that Jason’s trainer and physiotherapist do and the elements of good practice that they need.



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

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..... [6]

[Total: 16]

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2 Midwives use different tests to check the health of new-born babies.

(a) One of the tests midwives use is the **APGAR** score.

(i) Look at the **APGAR** score sheet below.

Four observations are missing.

Complete the **four** empty boxes with the correct observations.

Observation	Scores 0	Scores 1	Scores 2
<b>Appearance</b>	blue or pale all over	pink body but pale or blue fingers	..... .....
<b>Pulse</b>	0	.....	100 or more
<b>Grimace</b>	..... .....	feeble grimace or cry when stimulated	cry or pull away when stimulated
<b>Activity</b>	no bending of joints	some bending of joints	bending of joints that resist to straightening
<b>Respiration</b>	no breathing	weak irregular breathing	..... .....

[4]

(ii) The table shows the results of an **APGAR** test for baby Jane.

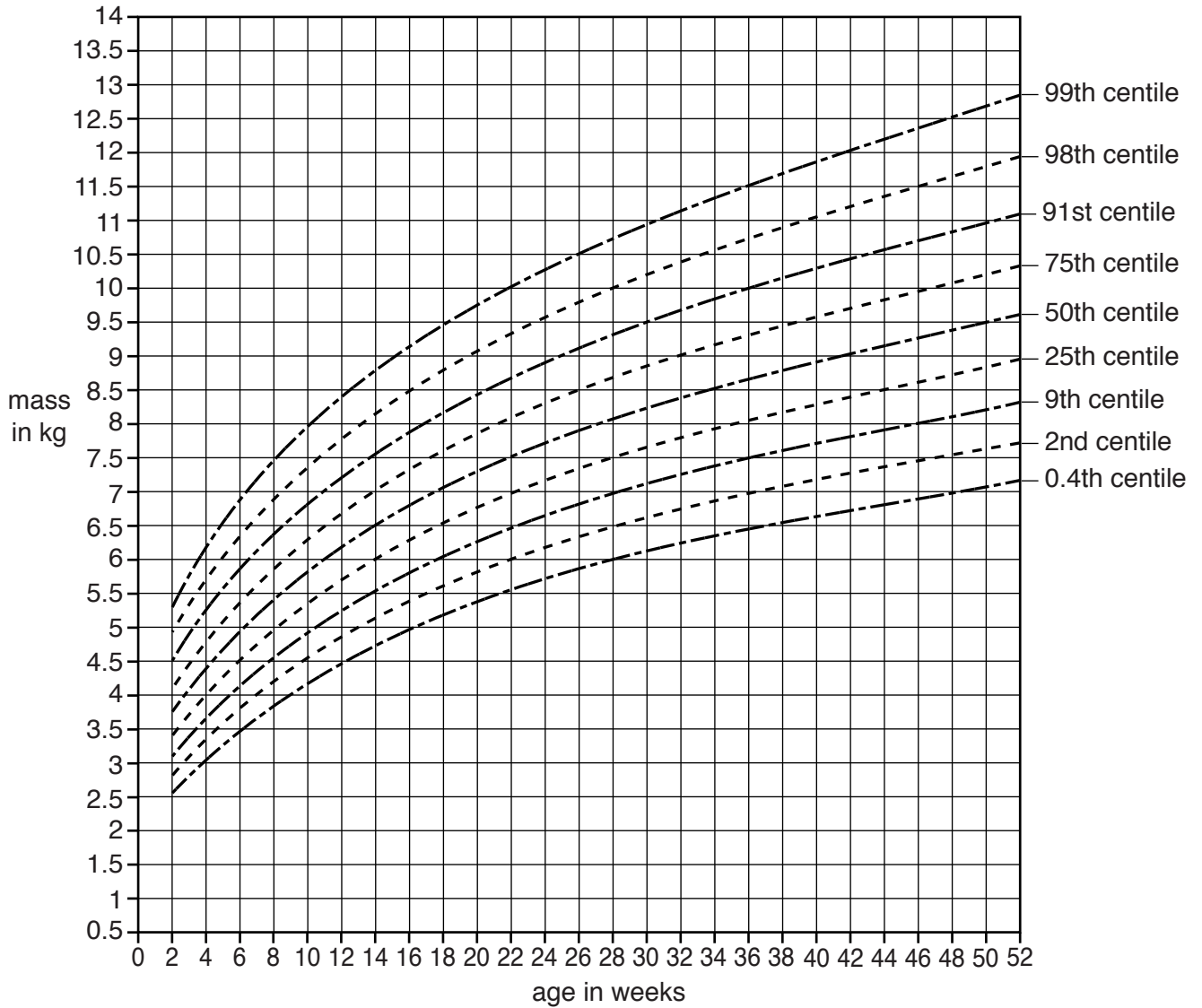
<b>A</b>	2
<b>P</b>	2
<b>G</b>	.....
<b>A</b>	2
<b>R</b>	2
Total	9

Complete the table to show the missing test score.

[1]

(b) Midwives also check the height and weight of babies, using growth charts.

Look at the growth chart.



Explain how a midwife would use the chart to determine the health of a baby.

Your answer should include an explanation of the term percentile.



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

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..... [6]

[Total: 11]

3 A Scene of Crime Officer (SOCO) took a photograph of a crime scene.

(a) The photograph had several important features.

Draw a straight line to connect each important **feature** to its correct **explanation**.

feature	explanation
a sharp image	The photograph was in black and white.
good contrast	The photograph was in focus.
good depth of field	A zoom lens was used.
showed small detail	Close and far objects were in focus.

[3]

(b) The SOCO enclosed the crime scene with police tape.

The area was a rectangle.

It measured 15m long and 9m wide.

(i) The SOCO calculated the area of the crime scene.  
Show his calculation and write down the answer.

area = .....m<sup>2</sup> [2]

(ii) Suggest reasons why his measurements may not have given a true value of the area of the crime scene.

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

[Total: 7]



- 4 Susan is an Environmental Scientist.  
She tests two samples of water. One sample comes from **river A**, the other from **river B**.  
These are her results.

Water sample	pH	Turbidity	Blood worms present	Water lice present	Shrimp present	Caddis-fly nymphs present	Mayfly nymphs present	Stone-fly nymphs present	Number of different organisms found
<b>River A</b>	8	Very turbid	✓	✗	✗	✗	✗	✗	1
<b>River B</b>	6	Clear	✗	✓	✓	✓	✓	✓	17

- (a)** What conclusions can Susan make about each river?

Use data from the table to help explain your answer.



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

..... [6]

- (b)** Scientists usually take several measurements when testing river water.

- (i)** Suggest reasons why several measurements of the same thing may give different results.

..... [2]

(ii) Explain the difference between **repeatability** and **reproducibility** when evaluating data.

repeatability .....

.....

reproducibility .....

.....

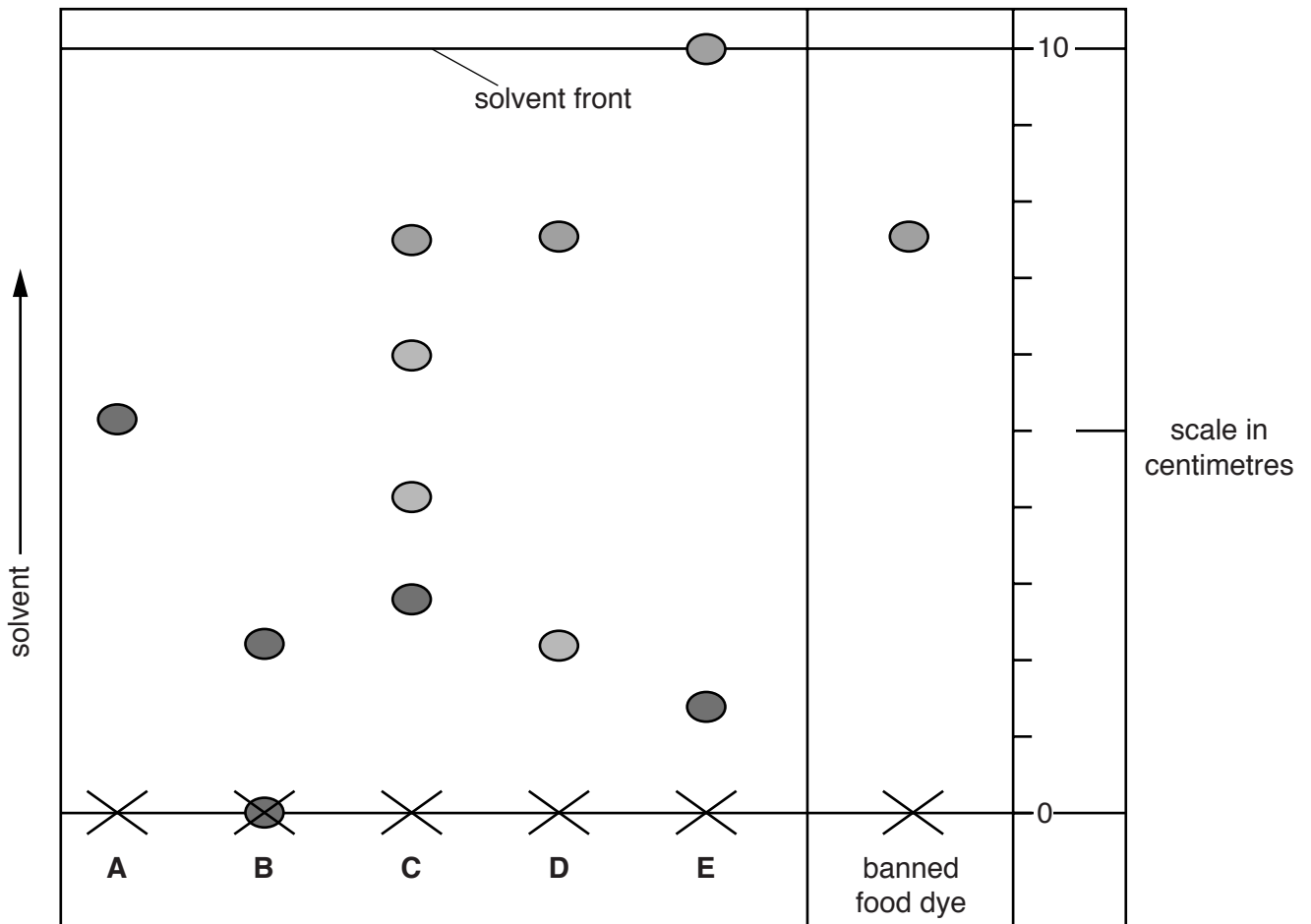
[2]

[Total: 10]

5 Joseph is a Public Analyst.  
He tests sweets to see if they contain a banned food dye.

He uses chromatography to test five sweets, **A**, **B**, **C**, **D** and **E**.

Here is his chromatogram.



- (a) Does the chromatogram suggest that any of the sweets need to be withdrawn from sale?

Explain your answer.

.....

.....

.....

..... [2]

- (b) Calculate the  $R_f$  value of the banned dye.  
Show your working.

$R_f$  value = ..... [2]

- (c) Sweets **B** and **D** both have a dye with the same  $R_f$  value of 0.2.  
The colour of the dye, however, is different.

What conclusion can be made from this information?

.....

.....

..... [1]

- (d) Which of these statements best describes the paper used to make the chromatogram?

Put a tick (✓) in the box next to the best answer.

- |                  |                          |
|------------------|--------------------------|
| solvent          | <input type="checkbox"/> |
| aqueous          | <input type="checkbox"/> |
| stationary phase | <input type="checkbox"/> |
| substance        | <input type="checkbox"/> |
| mobile phase     | <input type="checkbox"/> |

[1]

[Total: 6]

END OF QUESTION PAPER

**ADDITIONAL ANSWER SPACE**

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

A large rectangular area with a vertical solid line on the left side and horizontal dotted lines across the rest of the page, providing space for writing answers.



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