

Wednesday 30 May 2012 – Afternoon

GCSE ADDITIONAL APPLIED SCIENCE

A191/01 Science in Society (Foundation 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	
Centre number		Candidate number	

MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

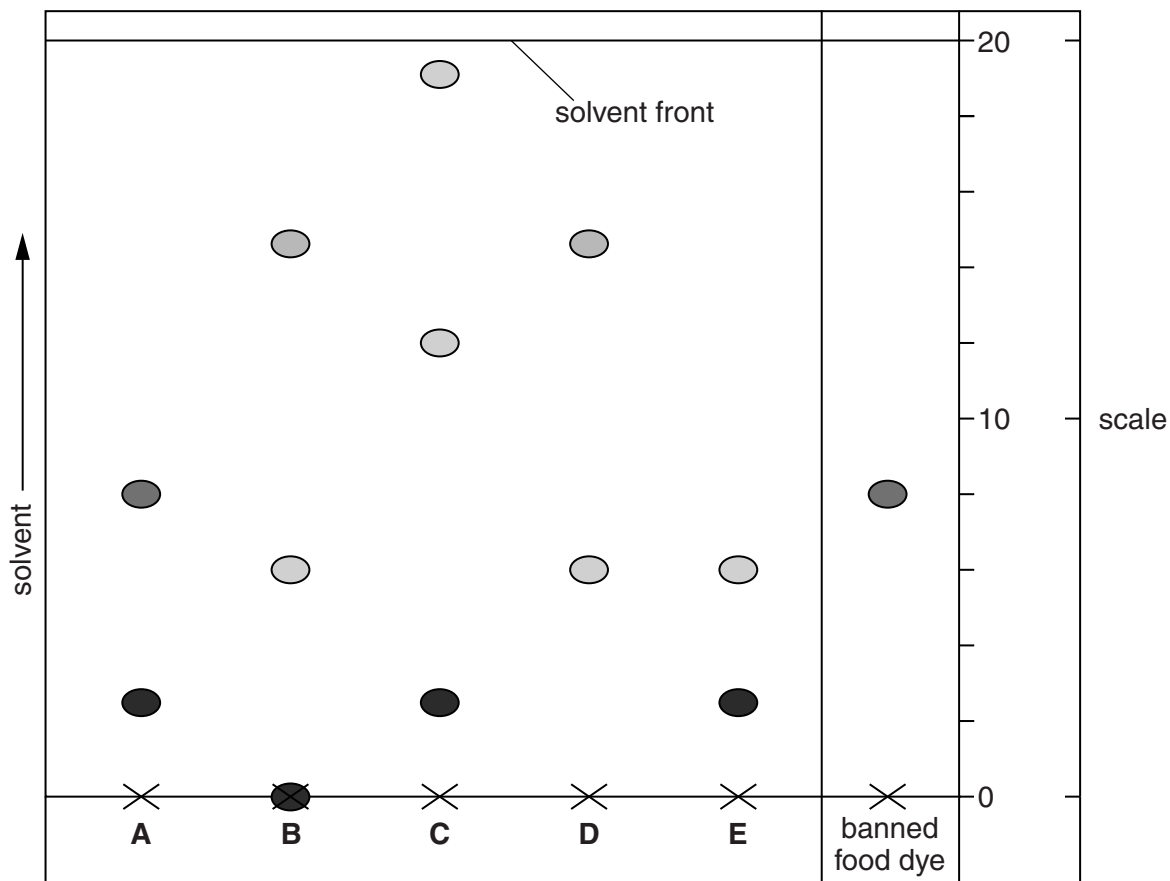
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting 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 Food scientists test drinks to make sure that they do not contain a banned food dye. They test five drinks, **A, B, C, D and E**, using paper chromatography.



- (a) Which drink, **A, B, C, D or E**, may contain the banned food dye?

.....

[1]

- (b) Which drink, **A, B, C, D or E**, contains **two** food dyes not found in any of the other drinks?

.....

[1]

- (c) Which drink, **A, B, C, D or E**, contains a dye that is not soluble in the solvent?

.....

[1]

- (d) The banned food dye is one of the substances listed below.

name of dye	Rf
brimicombe brown	0.7
flamingo pink	0.3
granite green	0.4
radish red	0.6

Identify the banned food dye by calculating its Rf value from the chromatogram.

Show your working.

name of banned food dye [2]

- (e) Describe how the food scientists carried out the paper chromatography test. Explain why the dyes are separated out.



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

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 11]

- 2 Mike is a talented athlete.
He trains at the local gym.

- (a) There are qualified practitioners working at the gym who make his **training** more effective.

Describe the jobs of **two** of these qualified practitioners.

.....

.....

.....

..... [2]

- (b) Mike does a standard fitness test for athletes.

- (i) For five minutes he steps up and down on a gym bench quickly.
He then measures his pulse rate three times at one minute intervals.

These are his results.

		pulse rate per minute
pulse rate 1	1 minute after finishing test	85
pulse rate 2	2 minutes after finishing test	73
pulse rate 3	3 minutes after finishing test	71

Use this formula to show that Mike's fitness number is close to 66.

$$\text{fitness number} = \frac{30\,000}{2 \times (\text{pulse rate 1} + \text{pulse rate 2} + \text{pulse rate 3})}$$

Show your working.

[2]

- (ii) Mike uses this table of fitness numbers to claim that his fitness is average.

gender	excellent	above average	average	below average	poor
male	more than 90	90–80	79–65	64–55	less than 55
female	more than 86	86–76	75–61	60–51	less than 50

Is Mike justified in making this claim?

Explain your answer using information from this table.

.....

 [2]

[Total: 6]

term

lifestyle

runs three miles twice a week

health

does not smoke and drinks in moderation

fitness

has had a cold that has lasted for the last three days

[2]

Explain how the nurse uses a sphygmomanometer to find the blood pressure.

What information might the blood pressure readings tell the nurse about Janine's health?



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

..... [6

[Total: 8]

- 4 Anita and Paul cannot have a baby by normal means.
Anita is given IVF treatment.

- (a) Look at the stages involved in IVF treatment.
They are not in the correct order.

Write down the stages in the correct order.

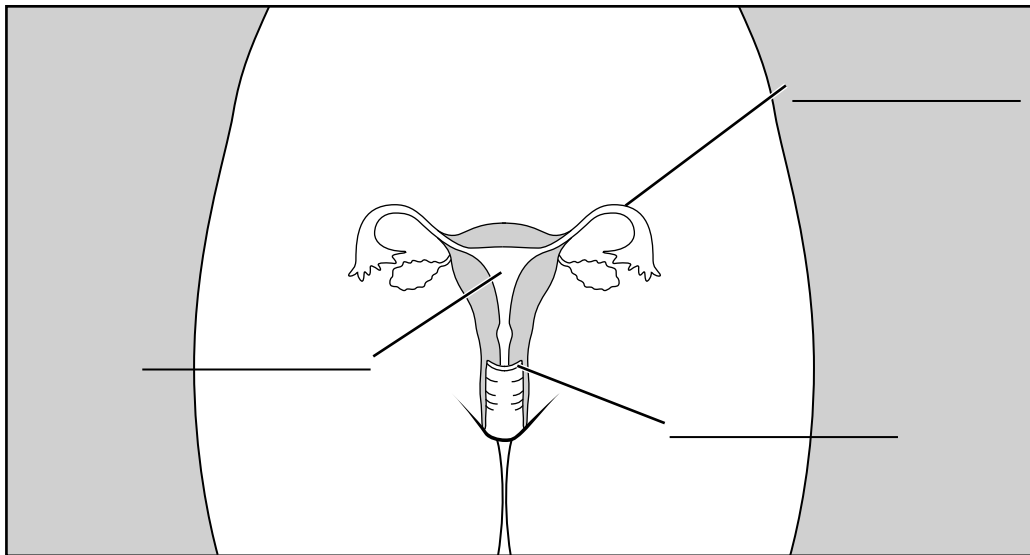
The first and last have been done for you.

- A eggs are collected
- B eggs are implanted
- C makes first visit to doctor for counselling
- D baby is born
- E eggs are fertilised in a glass dish
- F has hormone treatment

C					D
----------	--	--	--	--	----------

[2]

- (b) Complete the labels of Anita's reproductive system.



[2]

- (c) Draw a cross (x) on the diagram to show where the fertilised egg will be implanted.

[1]

(d) During antenatal care the midwife finds that Anita has developed high blood pressure since her last visit.

(i) Suggest what might be wrong with Anita.

.....
.....
..... [1]

(ii) Name another test that the midwife should do when she meets Anita.

Explain what the midwife is testing for and why.

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

[Total: 8]

- 5 This table is used to obtain an APGAR score for a baby.

observation	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

Describe how this table should be used and explain what the APGAR score means.



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

.....

.....

.....

.....

.....

.....

.....

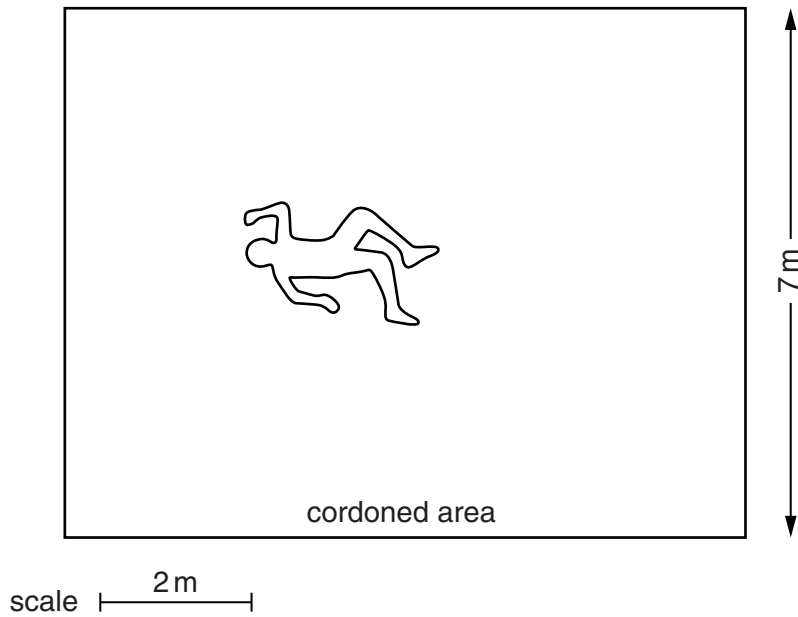
.....

.....

..... [6]

[Total: 6]

- 6 Scene of crime officers cordon off a crime scene.
They draw this scale diagram of the crime scene.



- (a) Use the scale information in the diagram to calculate the area of the crime scene.
Show your working.

area unit [3]

- (b) Suggest **two** reasons why the calculation may not be a true value for the area of the crime scene.

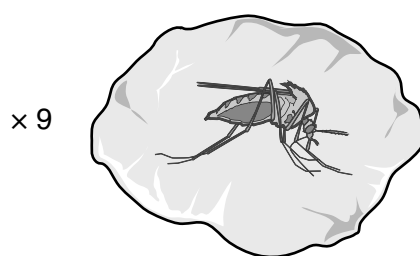
.....

.....

..... [2]

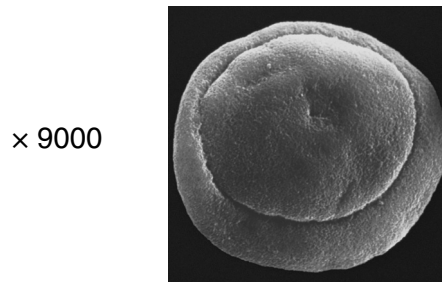
[Total: 5]

- 7 An insect is found preserved in amber.



Scientists want to know how old the insect is.

- (a) A pollen grain is found on the insect.



An electron microscope is used to get an image of the pollen grain.

Discuss the **focus**, **contrast**, and **magnification** of the image of the pollen grain.

.....

.....

.....

.....

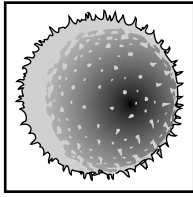
.....

.....

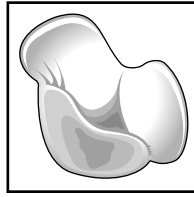
.....

..... [3]

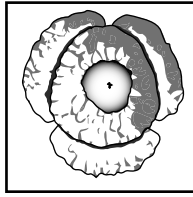
- (b) A scientist compares the image of the pollen grain against drawings of known samples.



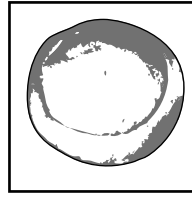
Pine tree
extinct 90
million years
ago



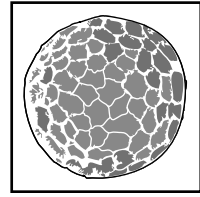
Fir tree
present day



Penny flower
extinct 10
thousand
years ago



Conifer tree
extinct 195
million years
ago



Lily
present day

- (i) Suggest how old the insect is. Give a reason for your answer.

.....
 [2]

- (ii) Information about these images was recorded by drawing or photographing them.

Give another way in which information can be recorded.

.....
 [1]

[Total: 6]

END OF QUESTION PAPER

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.