

Monday 15 June 2015 – Morning

**GCSE TWENTY FIRST CENTURY SCIENCE
BIOLOGY A/FURTHER ADDITIONAL SCIENCE A**

A163/02 Module B7 (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	
-----------------------	--	----------------------	--

Centre number						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

- The 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 **60**.
- This document consists of **12** pages. Any blank pages are indicated.

(b) One type of injury that can happen to a joint is a sprain.

Write down **two** other types of injury that can happen to a joint.

1

2

[2]

(c) Describe the treatments for a sprain.

.....

..... [2]

(d) Describe the role of a physiotherapist in the treatment of a joint injury.

.....

..... [1]

[Total: 11]

Turn over for the next question

2 Human blood contains four main components.

One of these is red blood cells.

(a) Name and explain the functions of the other **three** main components.

1

.....

2

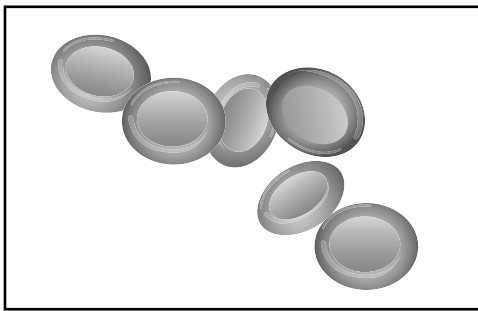
.....

3

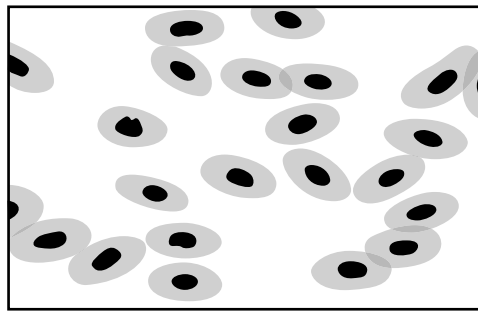
.....

[3]

(b) Look at the diagrams.
They show human red blood cells and frog red blood cells.



Human red blood cells



Frog red blood cells

Human red blood cells are better adapted to the job that they do than frog red blood cells.

Use the diagrams to suggest how.

.....

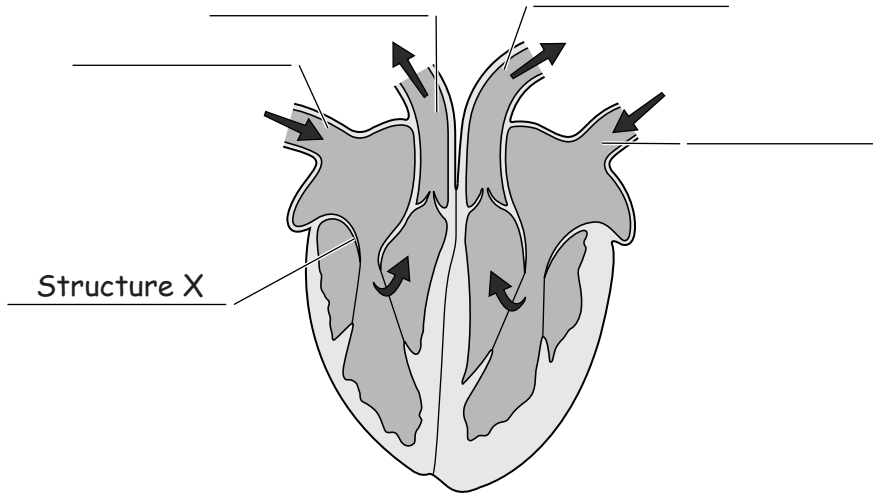
.....

..... [2]

(c) The heart pumps blood around the body.

Look at the diagram of a human heart.

(i) Complete the labels.



[3]

(ii) Describe the function of Structure X.

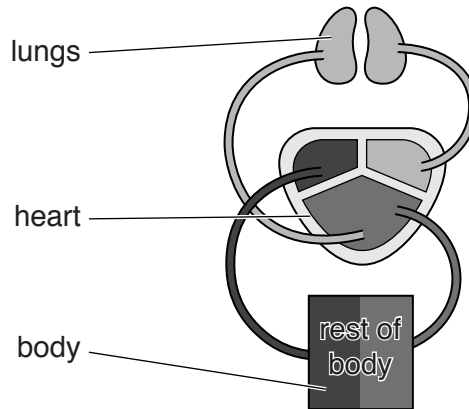
.....
..... [1]

(iii) The arrows on the diagram of the heart show a double circulation.

Explain what double circulation means.

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

- (iv) A frog's heart is different to a human heart.
Look at the diagram of a frog's heart and circulation.



Describe how the frog's heart is different to a human heart and suggest what effect this will have.

.....

.....

..... [2]

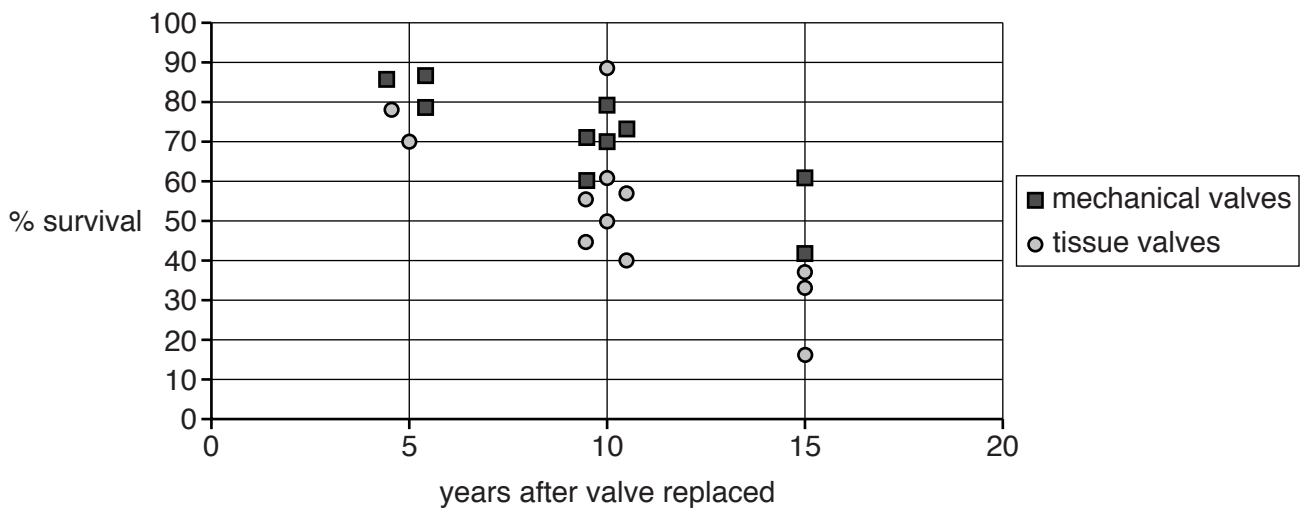
- (v) Sometimes valves in the heart do not work properly.

They can be replaced with either mechanical valves or valves made from animal tissue.

In ten studies, patients had received **mechanical** valves.

In twelve studies, patients had received animal **tissue** valves.

The graph shows data collected at approximately five-year intervals.



Write down **two** conclusions that can be made from the data shown in the graph on the opposite page.

Conclusion 1

.....

Conclusion 2

.....

[2]

(vi) To make a valid comparison between the two different studies, other pieces of information about the patients are needed.

Write down **two** other pieces of information needed.

1

.....

2

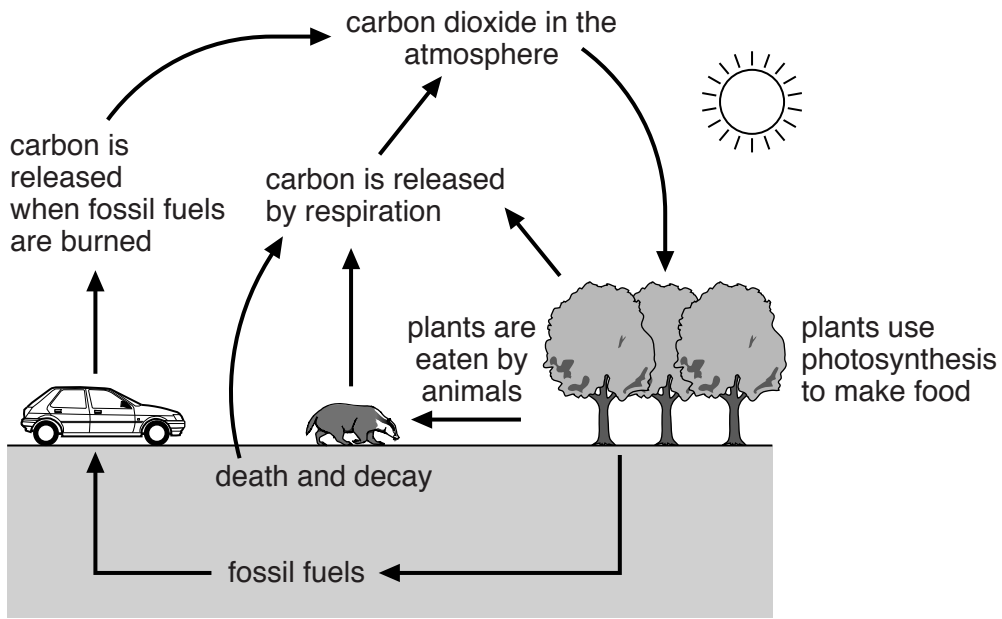
.....

[2]

[Total: 17]

Turn over for the next question

4 Look at the diagram of the carbon cycle.



(a) Some students think that the carbon cycle is a closed-loop system.

Use ideas about carbon atoms and energy to suggest reasons for and against this conclusion.

.....

.....

.....

.....

.....

..... [3]

(b) Rainforests are sometimes called stable ecosystems.

Why are they described as stable?

..... [1]

[Total: 4]

(b) Farmers also use pesticides.

Read the newspaper article.

Scientists develop new pesticide

Scientists have developed a new and safer pesticide.

Farmers must make sure that the level of the pesticide in their crops does not exceed a certain amount.

Protestors say that pesticides should never be used on food crops because it is a risk.

(i) Suggest a risk that the protestors are worried about.

..... [1]

(ii) What **two** factors need to be considered when assessing just how big the risk is?

1

2

[2]

(iii) Suggest **two** reasons why people are willing to accept this risk.

1

2

[2]

(c) Some pesticides can increase the risk of developing Parkinson's disease.

Two people in 1000 have Parkinson's disease.

Research suggests that exposure to pesticides may increase this risk by 50%.

(i) Calculate the risk of developing Parkinson's disease after exposure to pesticides. Show your working.

..... [2]

(ii) Use information from your answer in (i) to help to explain the difference between perceived risk and calculated risk when using pesticides.

.....

.....

..... [2]

[Total: 15]

Turn over

6 Stem cell technology and biomedical engineering are examples of new technologies.

(a) Parkinson’s disease occurs when some nerve cells in the brain die.

These nerve cells make dopamine.

Stem cell technology is being used to treat some people with Parkinson’s disease.

(i) Suggest what a stem cell is.

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

(ii) Suggest how stem cell technology could be used to treat people with Parkinson’s disease.

.....
.....
.....
..... [3]

(b) Our heartbeat is controlled by a natural pacemaker in the heart.

Biomedical engineering has been used to make an electrical pacemaker powered by a battery. This can save lives by replacing a faulty natural pacemaker.

Suggest **two** problems that may occur when using an artificial pacemaker.

1
.....
2
..... [2]

[Total: 7]

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.