OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE

BIOLOGY

F211

Cells, Exchange and Transport

F2157106111

Candidates answer on the question paper.

OCR supplied materials:
- Insert (inserted)

Other materials required:
- Electronic calculator
- Ruler (cm/mm)

Monday 16 May 2011
Morning

Duration: 1 hour

F211

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- The insert will be found in the centre of this document.
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- 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 pages at the end of this booklet. The question number(s) must be clearly shown.
- Answer **all** the questions.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- 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**.
- Where you see this icon you will be awarded marks for the quality of written communication in your answer.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.
- This document consists of **16** pages. Any blank pages are indicated.

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Answer **all** the questions.

1 **(a)** Fig. 1.1, **on the insert**, shows an electron micrograph of cells from the liver.

(i) Some cells, such as liver cells, contain a lot of Golgi apparatus.

State **one** function of the Golgi apparatus.

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

(ii) Suggest why the nuclear envelope contains pores.

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

(iii) State the function of the lysosomes.

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

(b) The liver is an organ.

Explain what is meant by the term *organ*.

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

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(c) Using the mammalian **gaseous exchange system** as an example, explain how the different cells and tissues enable the effective exchange of gases.



In your answer, you should use appropriate technical terms, spelt correctly.

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..... **[5]**

[Total: 11]

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2 The cell surface membrane allows different substances to enter and leave the cell.

(a) List **three** components of a cell surface membrane.

.....

.....

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

(b) **(i)** Explain what is meant by the term *active transport*.

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

(ii) State **two** examples of active transport in cells.

For each example, you should name the substance that is transported **and** the cell involved.

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

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(c) In addition to active transport, substances can pass through cell surface membranes by:

- diffusion
- facilitated diffusion
- osmosis
- bulk transport (endocytosis / exocytosis)

For each example described in Table 2.1 below, state how the substance crosses the cell surface membrane. The first one has been done for you.

Table 2.1

example	mechanism of movement across cell surface membrane
release of enzymes into the gut	bulk transport
a plant cell taking up water	
calcium ions entering a nerve cell down a concentration gradient	
oxygen entering a red blood cell	

[3]

[Total: 10]

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3 Large animals, such as mammals, need efficient transport systems.

(a) Fig. 3.1 shows a section through the mammalian heart.

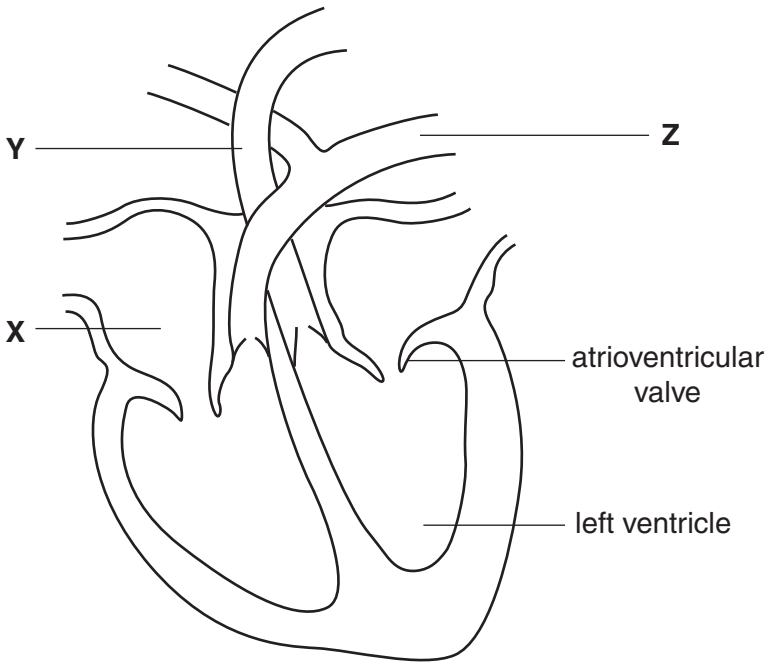


Fig. 3.1

(i) Name the parts labelled **X**, **Y** and **Z**.

X .....

Y .....

Z ..... **[3]**

(ii) Explain why the wall of the left ventricle is thicker than the wall of the left atrium.

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

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(iii) Explain how pressure changes in the heart bring about the closure of the atrioventricular (bicuspid) valve.

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

(b) The mammalian transport system is a double circulatory system.

An efficient circulatory system consists of a pump, a means of maintaining pressure, a transport medium and exchange surfaces.

State the component of the **mammalian circulatory system** that fulfils each of these roles.

The first one has been done for you.

pump ..... heart .....

means of maintaining pressure .....

transport medium .....

exchange surface .....

[3]

[Total: 11]

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4 In plants, dividing cells can be found in meristematic tissue.

(a) Name **two** parts of a plant where meristematic tissue can be found.

.....

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

(b) In an investigation, a student observed the cells in a stained section of meristematic tissue. The student counted how many cells could be seen in each stage of the cell cycle.

Table 4.1 shows the results.

Table 4.1

stage of cell cycle	percentage cells in stage (%)
interphase	82.00
prophase	4.34
metaphase	3.23
anaphase	3.23
telophase	7.20

(i) Explain why the meristematic tissue needed to be stained for this investigation.

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

(ii) Name the type of nuclear division that occurs in a plant meristem.

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

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(c) Using the results shown in Table 4.1, calculate the percentage of the cell cycle taken up by nuclear division.

Show your working.

Answer = ... % **[2]**

(d) State **one** way in which the products of **meiosis** are different from the products of nuclear division in meristematic tissue.

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

[Total: 8]

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5 Fig. 5.1 shows a spirometer, which is used to investigate lung function.

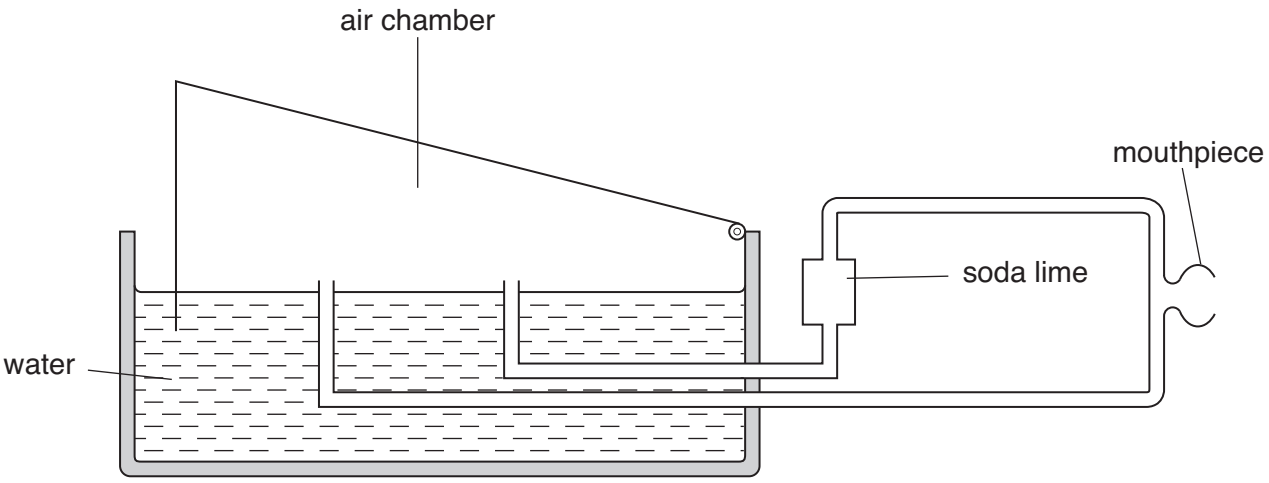


Fig. 5.1

(a) (i) Describe how the spirometer would be used to measure tidal volume.

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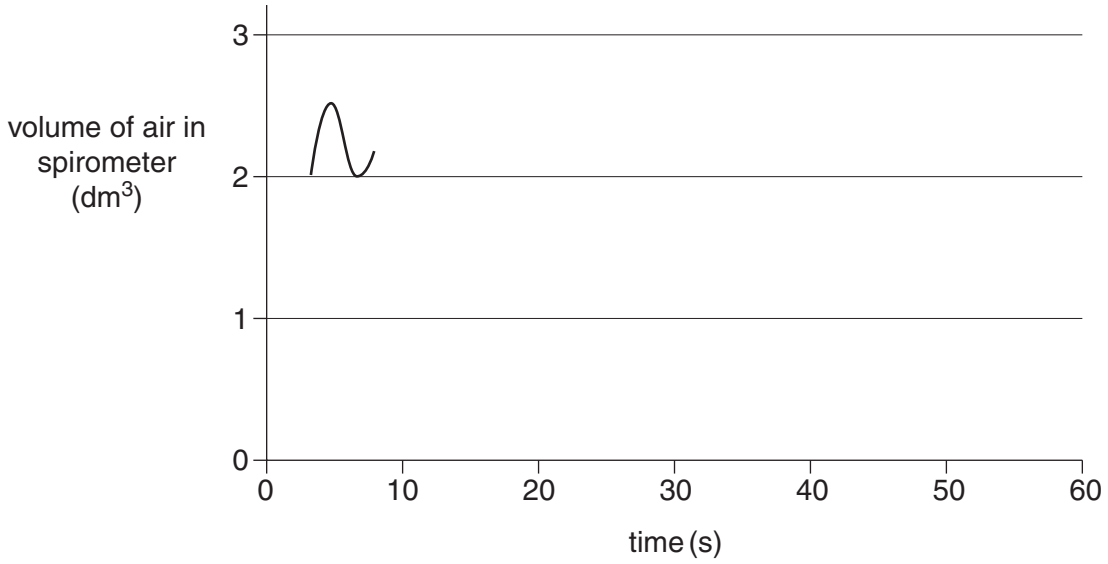
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..... **[3]**

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(ii) Using the axes below, complete the spirometer trace that you expect to see recorded from a healthy sixteen year old over **ten further breaths**, while at rest.



[2]

(iii) Describe how you could use a spirometer trace to measure the rate of oxygen uptake.

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

(b) Suggest **two** factors that should be considered when carrying out a risk assessment for an experiment using a spirometer.

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

[Total: 10]

QUESTION 6 STARTS ON PAGE 12

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6 **(a)** Translocation is the movement of assimilates along the phloem from one part of a plant to another.

(i) Name the sugar molecule most commonly translocated.

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

(ii) A tissue may act as a source or a sink at different times.

For each tissue listed below, state whether it is acting as a source, a sink or neither. The first one has been done for you.

tissue	source, sink or neither
a leaf in summer	source
a developing bud	
xylem	
an actively growing root tip	

[3]

(b) The sap in the phloem sieve tubes is moved by mass flow.

State **two** adaptations of sieve tubes that enable mass flow to occur.

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

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(c) Describe how assimilates are loaded into the phloem.



In your answer, you should use appropriate technical terms, spelt correctly.

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..... **[4]**

[Total: 10]

END OF QUESTION PAPER

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ADDITIONAL PAGE

If additional space is required, you should use the lined pages below. The question number(s) must be clearly shown.

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ADDITIONAL PAGE

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