



ADVANCED SUBSIDIARY GCE
BIOLOGY
 Cells, Exchange and Transport

F211

Candidates answer on the question paper

OCR Supplied Materials:

- Insert (Inserted)

Other Materials Required:

- Electronic calculator
- Ruler (cm/mm)

Monday 1 June 2009
Afternoon

Duration: 1 hour



Candidate Forename		Candidate Surname	
--------------------	--	-------------------	--

Centre Number						Candidate Number				
---------------	--	--	--	--	--	------------------	--	--	--	--

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

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**.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.



Where you see this icon you will be awarded marks for the quality of written communication in your answer.

- This document consists of **16** pages. Any blank pages are indicated.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	9	
2	15	
3	12	
4	7	
5	9	
6	8	
TOTAL	60	

Answer **all** the questions.

1 Fig. 1.1 (a) is a diagram of a part of a mammalian lung.

Fig. 1.1 (b) is an enlargement of part of the lining of the bronchus.

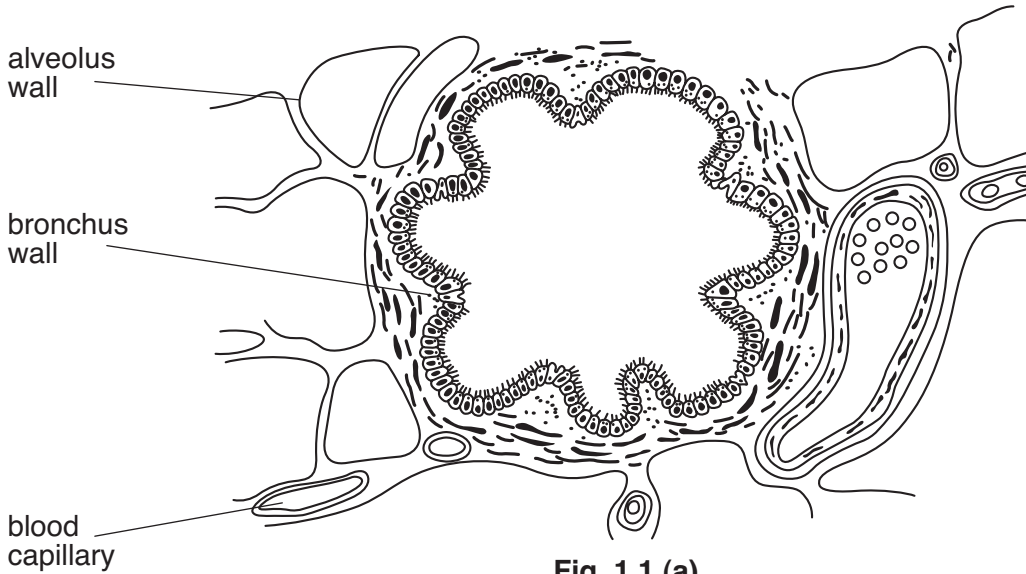


Fig. 1.1 (a)

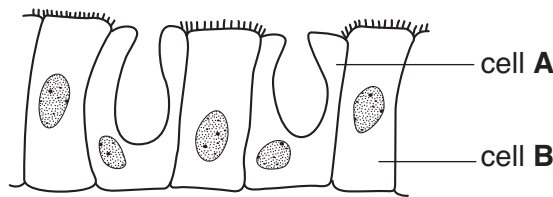


Fig. 1.1 (b)

(a) (i) Name the two types of cell, **A** and **B**, shown lining the **bronchus**.

A

B [2]

(ii) Describe how cell types **A** and **B** work together to keep the lung surface clear of dust and other particles.

.....

 [3]

(iii) The bronchus wall also contains smooth muscle fibres.

State the function of the smooth muscle fibres.

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

(b) (i) Explain why blood capillaries and alveoli are very close together.

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

(ii) The walls of the alveoli contain elastic fibres.

State the function of these elastic fibres.

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

[Total: 9]

2 Fig. 2.1 shows the structure of a plasma (cell surface) membrane.

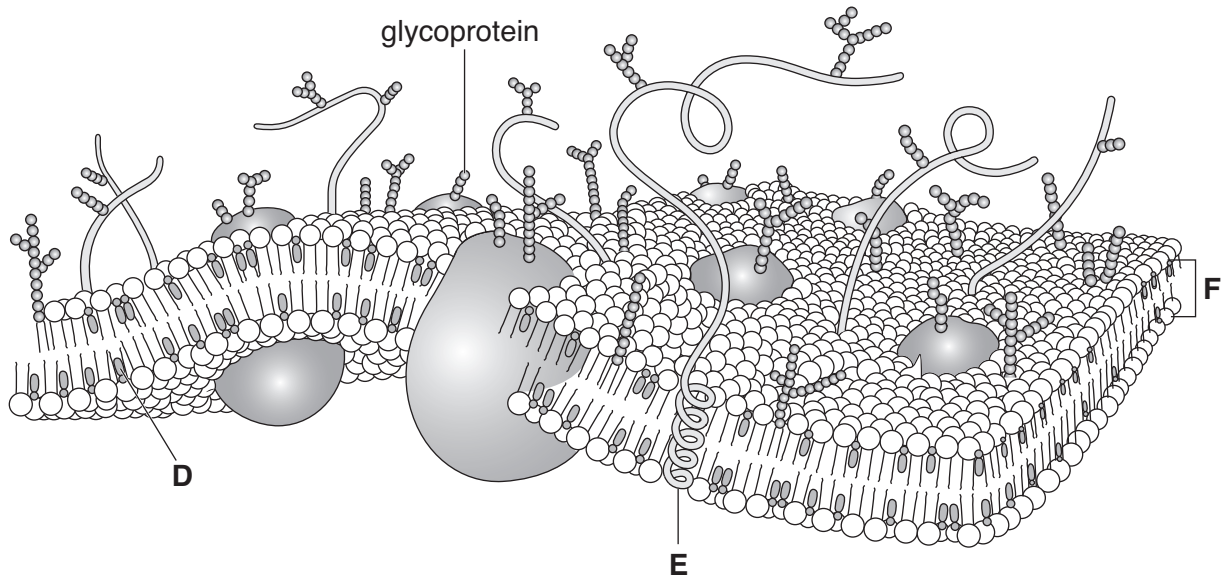


Fig. 2.1

(a) (i) Name the components of the plasma (cell surface) membrane labelled **D**, **E** and **F**.

D

E

F [3]

(ii) State **one** function for each of the components **D**, **E** and **F**.

D

.....

E

.....

F

..... [3]

- (b) Glycoprotein molecules are positioned in the plasma (cell surface) membrane with the carbohydrate chain outside the cell.

This is to allow the glycoproteins to act as receptors in the process of cell signalling.

- (i) Explain what is meant by the term *cell signalling*.

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

- (ii) Explain **how** a glycoprotein can act as a receptor.

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

(c) A student investigated the effect of temperature on the release of pigment from pieces of beetroot.

She cut a fresh beetroot into four pieces and placed each piece into water at a different temperature.

After 10 minutes she removed the beetroot and used a colorimeter to test how much pigment had entered the water.

She placed the coloured water into the colorimeter and measured the percentage transmission of light through the water. Her results are shown in Table 2.1.

Table 2.1

temperature of water (°C)	percentage transmission of light
10	85
30	87
50	78
100	0

(i) The results show that below 50 °C little pigment had entered the water.

Explain why there was no transmission of light after the beetroot had been placed in water at 100 °C.

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

(ii) Suggest **three** ways in which the student could have improved her investigation.

1
.....
2
.....
3
..... [3]

[Total: 15]

3 (a) Complete the following paragraph about the loss of water from plants.

The loss of water from the aerial parts of a plant is known as
The majority of water is lost from the leaves. Water is transported up the stem in the and passes into the mesophyll cells of the leaf by Water evaporates from the surface of these cells. From the air spaces in the leaf, the water vapour diffuses out of the leaf through the [4]

(b) (i) Explain why water loss from the leaves of a plant is unavoidable.

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

(ii) Name the **type** of plant adapted to reduce water loss from its leaves.

..... [1]

(iii) State **and** explain **two** adaptations of leaves that reduce evaporation.



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

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

[Total: 12]

Turn over

4 (a) Table 4.1 compares the structures of prokaryotic and eukaryotic cells.

Complete the table.

Table 4.1

prokaryotic	eukaryotic
no true nucleus	genetic material held in a nucleus
genetic material consists of 'naked' DNA	
average diameter of cell 0.5 – 5 µm	
	ribosomes about 22 nm in diameter
	cell wall sometimes present

[4]

(b) The cytoskeleton is an important component in the cytoplasm of all eukaryotic cells.

(i) Name **one** structure, **associated with the cytoskeleton**, which can bring about cell movement.

..... [1]

(ii) Suggest **two** processes **inside cells** that rely on the cytoskeleton for movement.

.....

 [2]

[Total: 7]

5 (a) Fig. 5.1, on the insert, shows some drawings of a cell during different stages of mitosis.

Place stages P, Q, R, S and T in the correct sequence.

The first stage has been identified for you.

S

..... [4]

(b) Mitosis is part of the cell cycle.

Fig. 5.2 shows a diagram of the cell cycle.

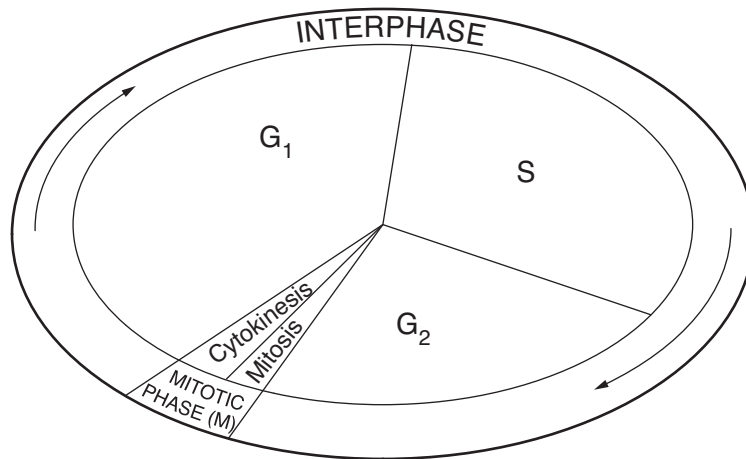


Fig. 5.2

(i) Name **one** process that occurs during stages G₁ and G₂.

..... [1]

(ii) During stage S, the genetic information is copied and checked.

Suggest what might happen if the genetic information is not checked.

.....

 [2]

(c) During **meiosis** a cell undergoes two divisions.

Suggest how cells produced by meiosis may differ from those produced by mitosis.

.....

.....

.....

.....

.....

.....

..... [2]

[Total: 9]

11
BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE
QUESTION 6 STARTS ON PAGE 12

6 (a) (i) Name the type of muscle found in the walls of the heart chambers.
 [1]

(ii) Name the process that creates pressure inside the heart chambers.
 [1]

(b) Fig. 6.1 shows the changes in pressure inside the heart chambers during one heart beat.

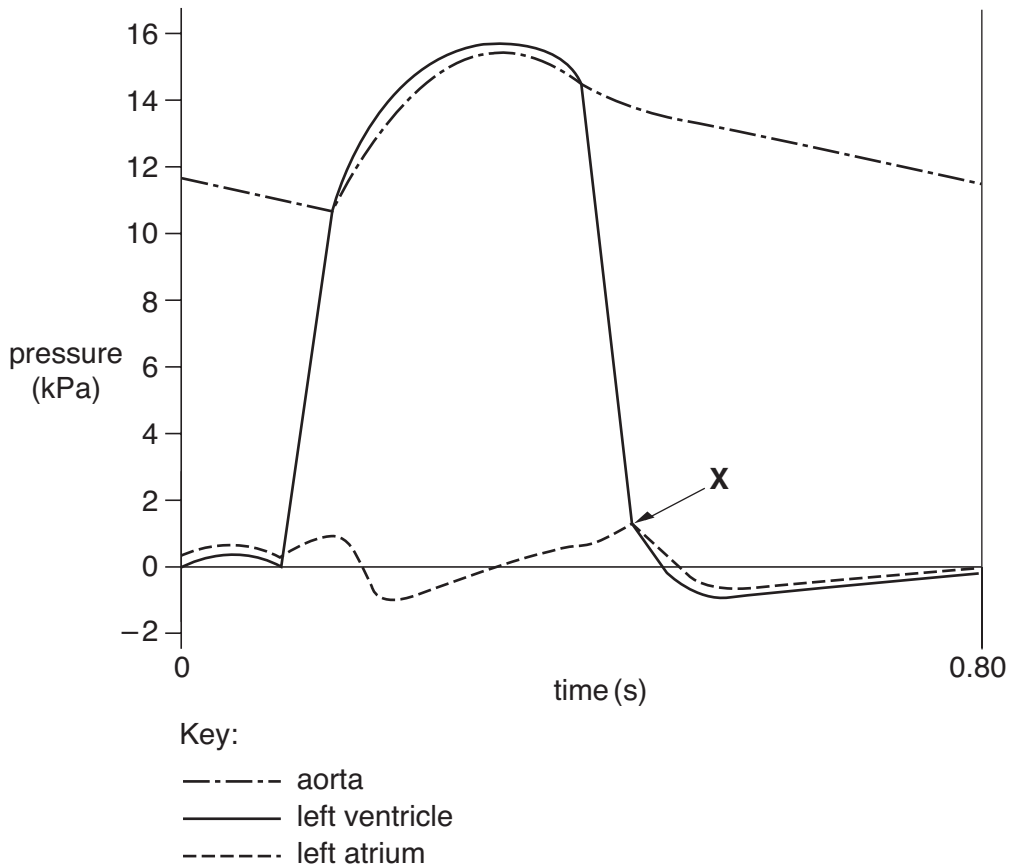


Fig. 6.1

(i) Calculate the heart rate from the information in Fig. 6.1.

Show your working and give your answer **to the nearest whole number**.

Answer = beats min⁻¹ [2]

14
BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

15
BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE



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, is given to all schools that receive assessment material 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 1PB.

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.