THIS IS A NEW SPECIFICATION

OCR
RECOGNISING ACHIEVEMENT

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

OCE/10512

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

MODIFIED LANGUAGE

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.

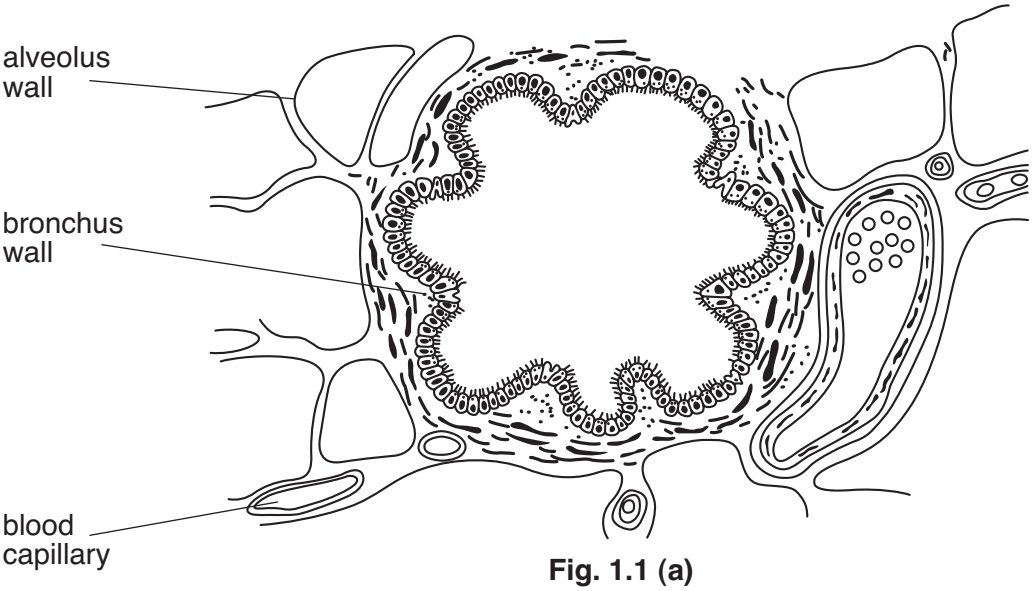

Fig. 1.1 (a)

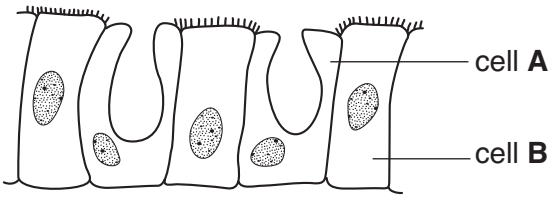

Fig. 1.1 (b)

(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.

.....

.....

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.....

.....

..... **[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.

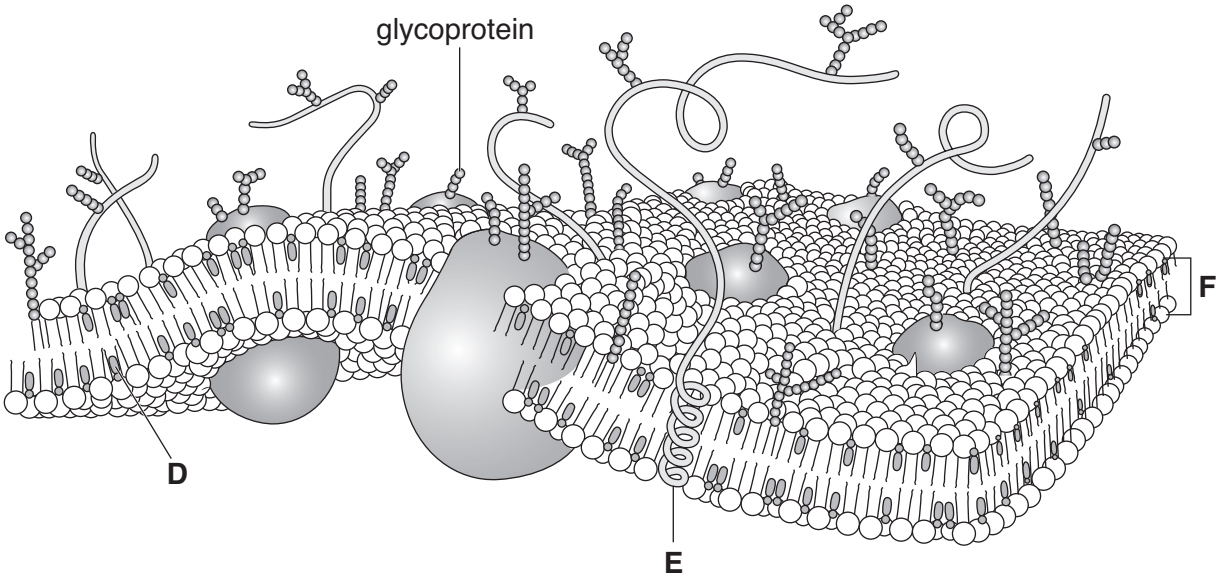

Fig. 2.1

(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.

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..... **[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. The water vapour diffuses out of the air spaces in 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.

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

[Total: 12]

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.

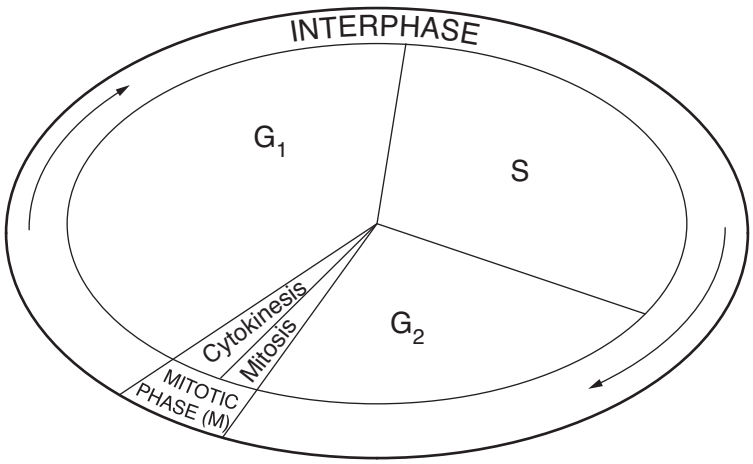

Fig. 5.2

(i) Name **one** process that occurs during stages G_1 and G_2.

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

(ii) The genetic information is copied and checked during stage **S**.

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

.....

.....

.....

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

(c) A cell undergoes two divisions during **meiosis**.

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

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

[Total: 9]

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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.

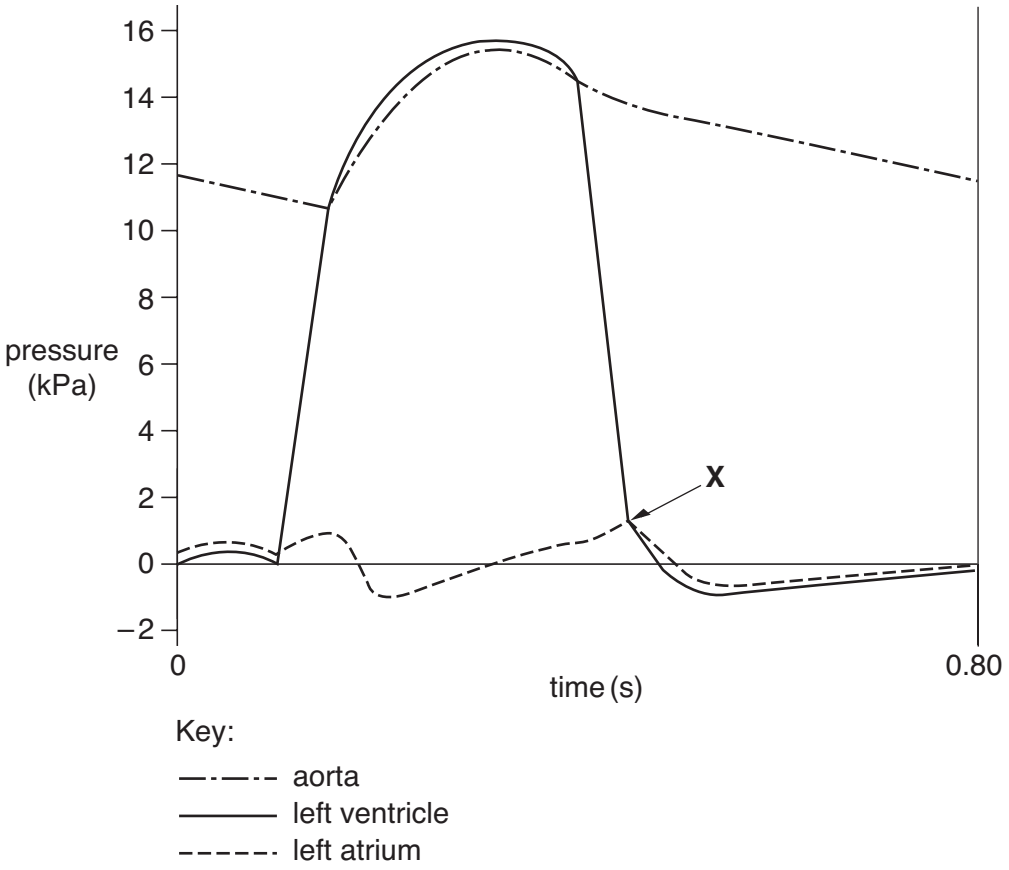

Fig. 6.1

(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]**

(ii) Describe and explain what happens **immediately after X** on Fig. 6.1.

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

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

[Total: 8]

END OF QUESTION PAPER

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