

<b>Candidate Forename</b>		<b>Candidate Surname</b>	
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<b>Centre Number</b>						<b>Candidate Number</b>				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
ADVANCED SUBSIDIARY GCE**

**F211**

**BIOLOGY**

**Cells, Exchange and Transport**

**MONDAY 1 JUNE 2009: Afternoon**

**DURATION: 1 hour**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the question paper**

**OCR SUPPLIED MATERIALS:**

**Insert (inserted)**

**OTHER MATERIALS REQUIRED:**

**Electronic calculator**

**Ruler (cm/mm)**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **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.**
- **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.**

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Answer ALL the questions.

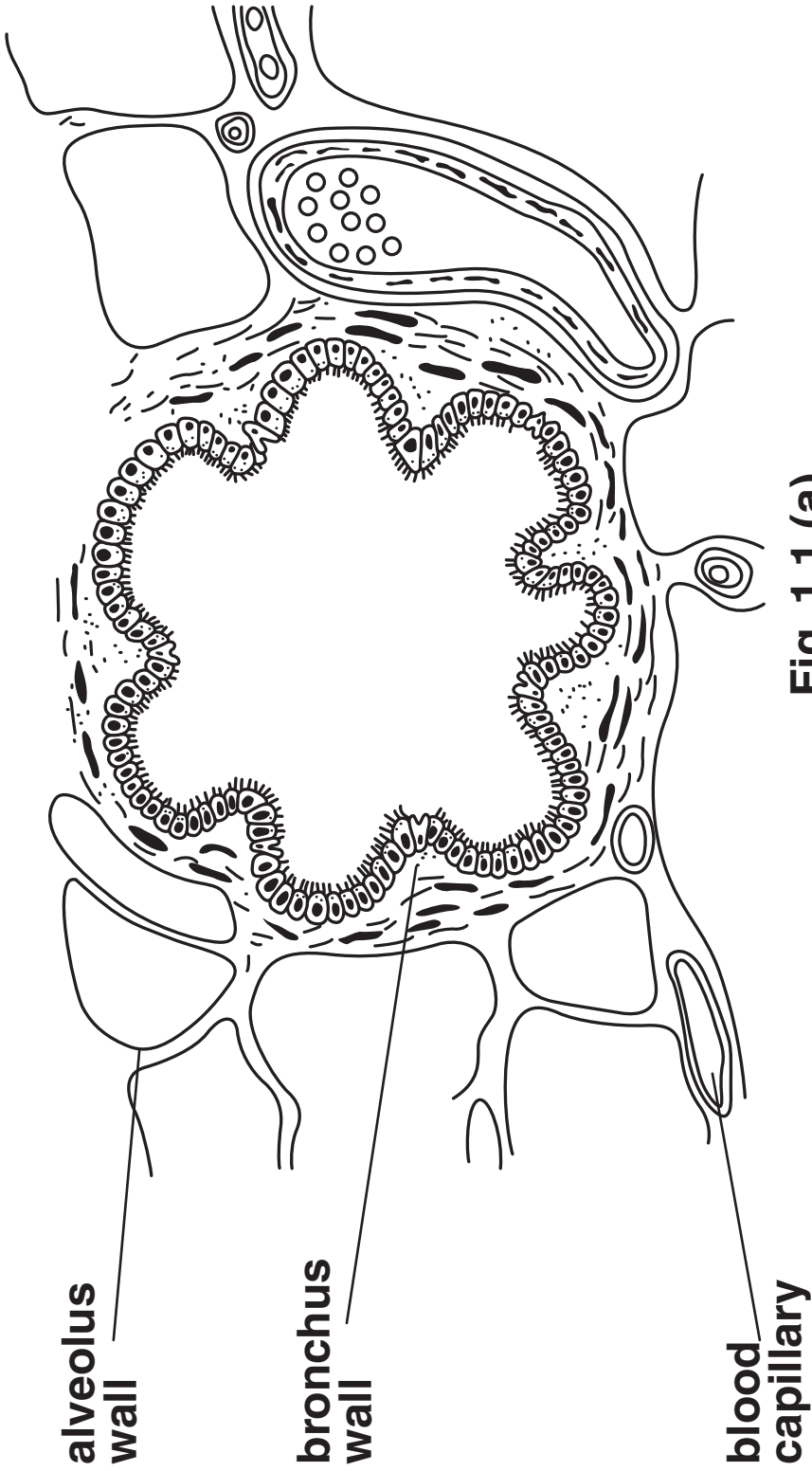


Fig. 1.1 (a)

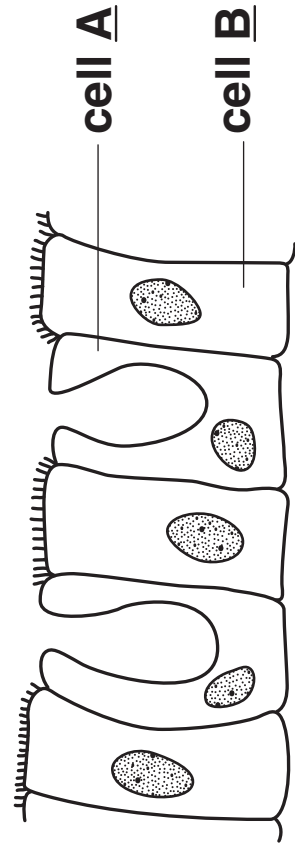


Fig. 1.1 (b)

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

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

(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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(iii) The bronchus wall also contains smooth muscle fibres. [3]

State the function of the smooth muscle fibres.

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 [1]

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

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**[2]**

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

**State the function of these elastic fibres.**

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**[1]**

**[Total: 9]**

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

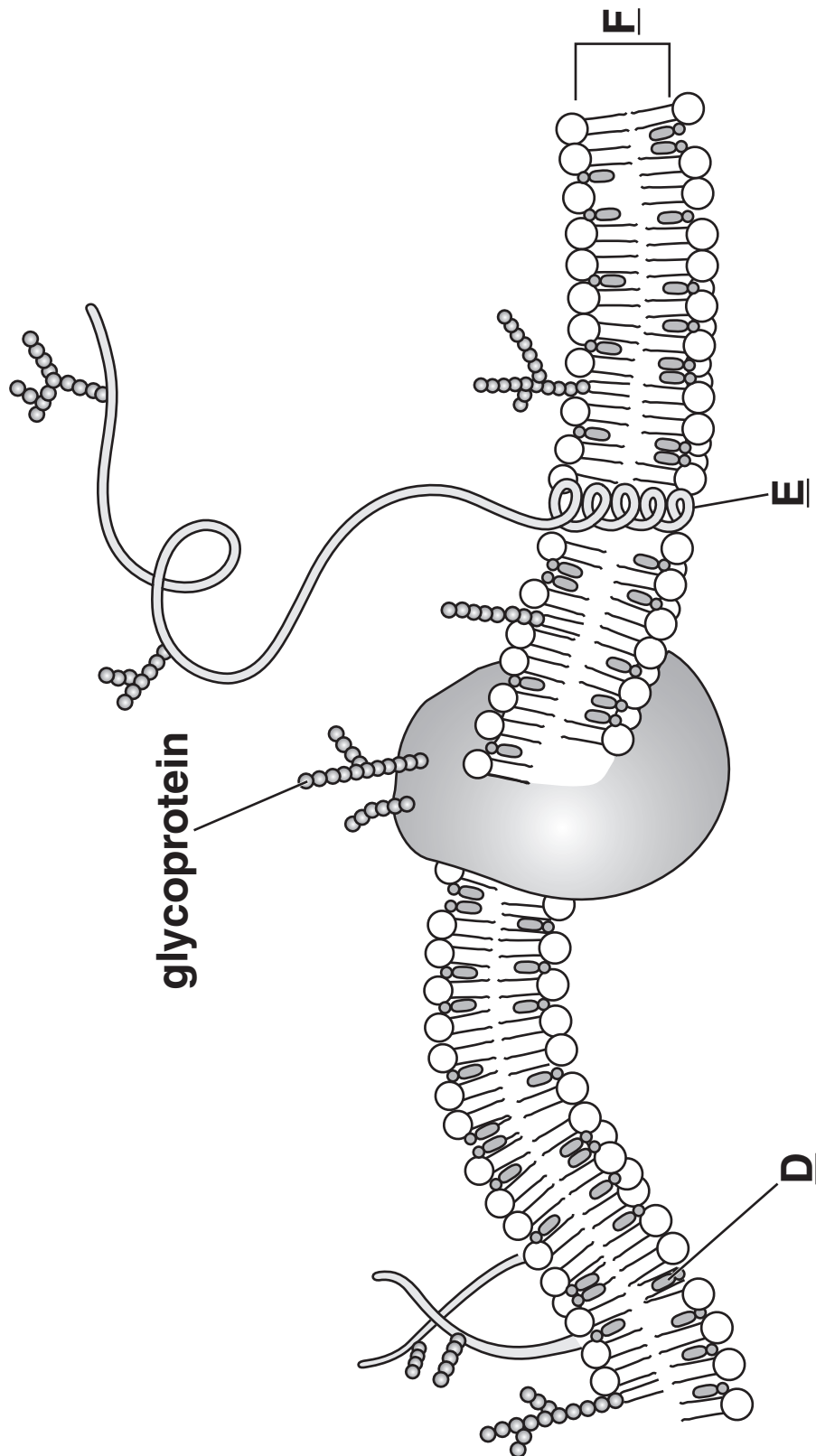


Fig. 2.1



(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*.**

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[2]

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

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[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**

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

- (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 \_\_\_\_\_

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2 \_\_\_\_\_

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3 \_\_\_\_\_

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[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.**

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**[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]

- 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 $\mu\text{m}$	
	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.

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[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**

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[4]



(b) Mitosis is part of the cell cycle.

Fig. 5.2 shows a diagram of the cell cycle.

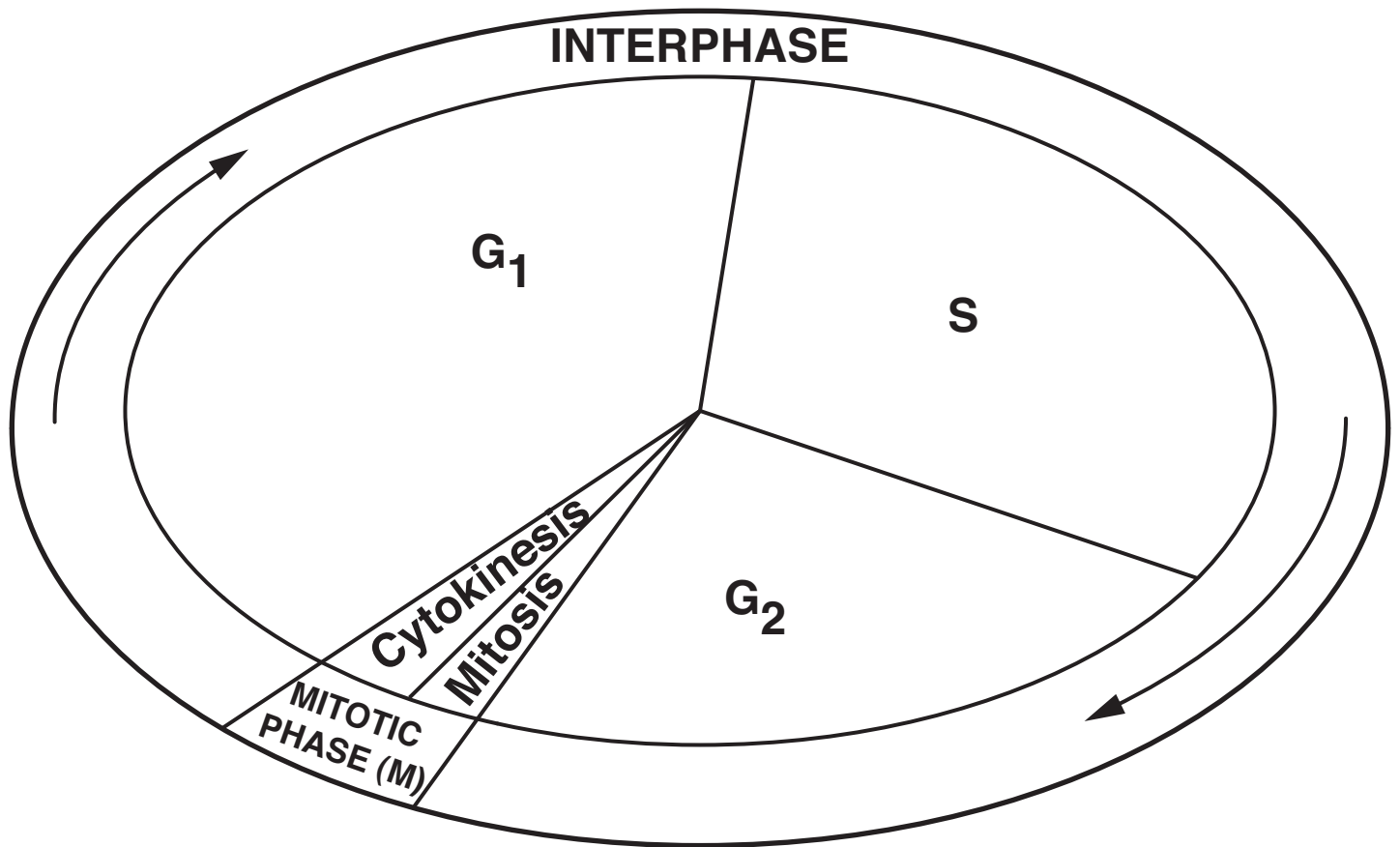


Fig. 5.2

(i) Name ONE process that occurs during stages G<sub>1</sub> and G<sub>2</sub>.

\_\_\_\_\_ [1]

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

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

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[2]

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

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

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[2]

**[Total: 9]**

**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.

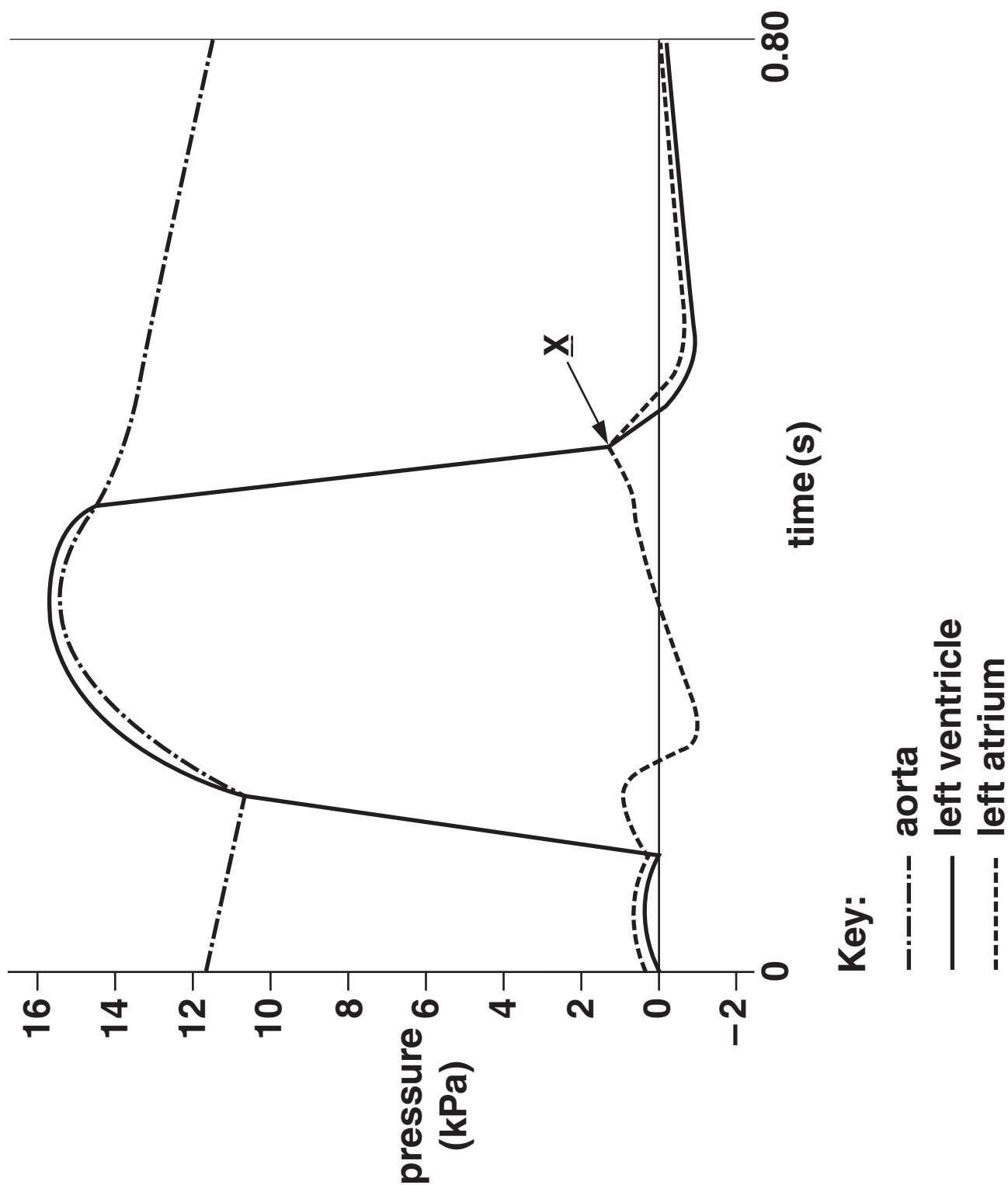


Fig. 6.1

- (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<sup>-1</sup> [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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