

The Heart

Question Paper 2

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Transport in mammals
Sub Topic	The Heart
Booklet	Theory
Paper Type	Question Paper 2

Time Allowed : 69 minutes

Score : / 57

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

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A series of horizontal dotted lines for writing.

- 2 (a) Complete Table 5.1 by numbering each event to show the sequence occurring in the initiation and control of one heart beat.

Use 1 as the first event in the sequence.

Table 5.1

event	sequence
impulses pass down septum through conducting fibres known as the bundle of His	
atrioventricular node sends out impulses	
impulses travel across atrial walls	
impulses reach base of ventricles (apex of heart)	
impulses pass up through Purkyne fibres in ventricle walls	
sinoatrial node sends out impulses	

[3]

- (b) Explain the circumstances that cause the closing of the semi-lunar valves during the cardiac cycle.

.....

.....

.....

.....[2]

- (c) At the arterial end of a capillary bed in muscle tissue, the hydrostatic pressure is high enough to cause the formation of tissue fluid.

Explain the differences between the composition of blood and the composition of tissue fluid at the arterial end of a capillary bed.

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.....

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.....[2]

[Total: 7]

- 3 Coronary artery bypass grafting is the most common heart operation in the world.

Fig. 6.1 is a diagram of a coronary bypass. The graft is a section of a healthy blood vessel. The blood vessel used in Fig. 6.1 is the internal mammary artery. It is a common choice for surgeons as it is quite resistant to arteriosclerosis.

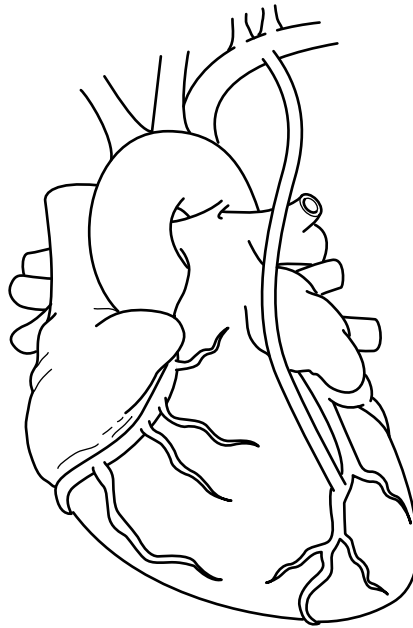


Fig. 6.1

- (a) Use label lines and the following letters to label the following on Fig. 6.1:

- A aorta
- B coronary artery
- C internal mammary artery
- D pulmonary artery
- E right atrium
- F vena cava

[3]

- (b) On Fig. 6.1, mark with an **X**, the diseased area of the coronary artery for which the surgery has been performed.

[1]

- (c) With reference to coronary heart bypass surgery, discuss the difficulties in achieving a balance between prevention and cure.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 7]

4 (a) Describe the function of each of the following structures in the human heart:

(i) sinoatrial node (SAN)

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

(ii) atrioventricular node (AVN)

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

(iii) left atrioventricular (bicuspid) valve.

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

(b) Fig. 2.1 shows the changes in blood pressure in the left atrium, left ventricle and aorta during one complete cardiac cycle.

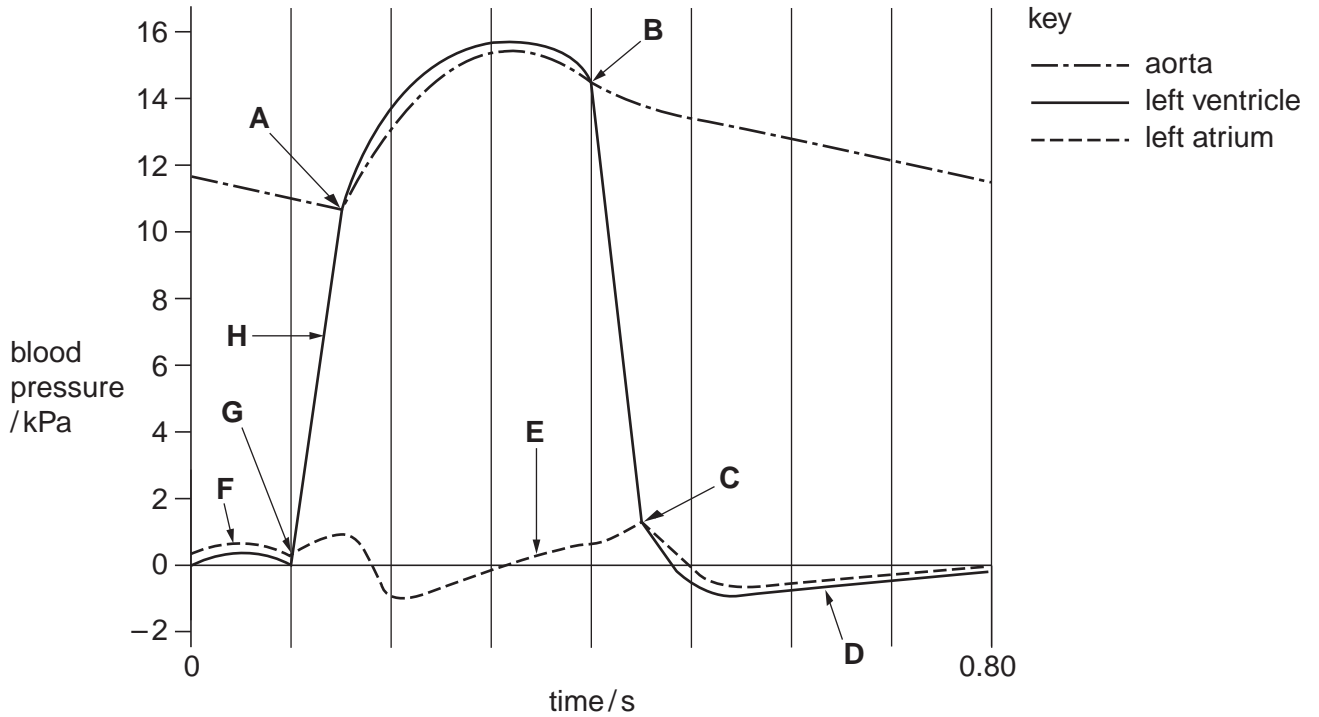


Fig. 2.1

Complete the table below using the appropriate letter, **A** to **H**, to match the points from the graph to the correct statement.

You must only put one letter in each box. You may use each letter once, more than once or not at all.

statement	letter
left atrioventricular (bicuspid) valve starting to open	
left atrioventricular (bicuspid) valve starting to close	
left ventricle starting to contract	
minimum blood remaining in left ventricle	

[4]

[Total: 10]

6 Fig. 1.1 shows the structures of four biological molecules **A**, **B**, **C** and **D**.

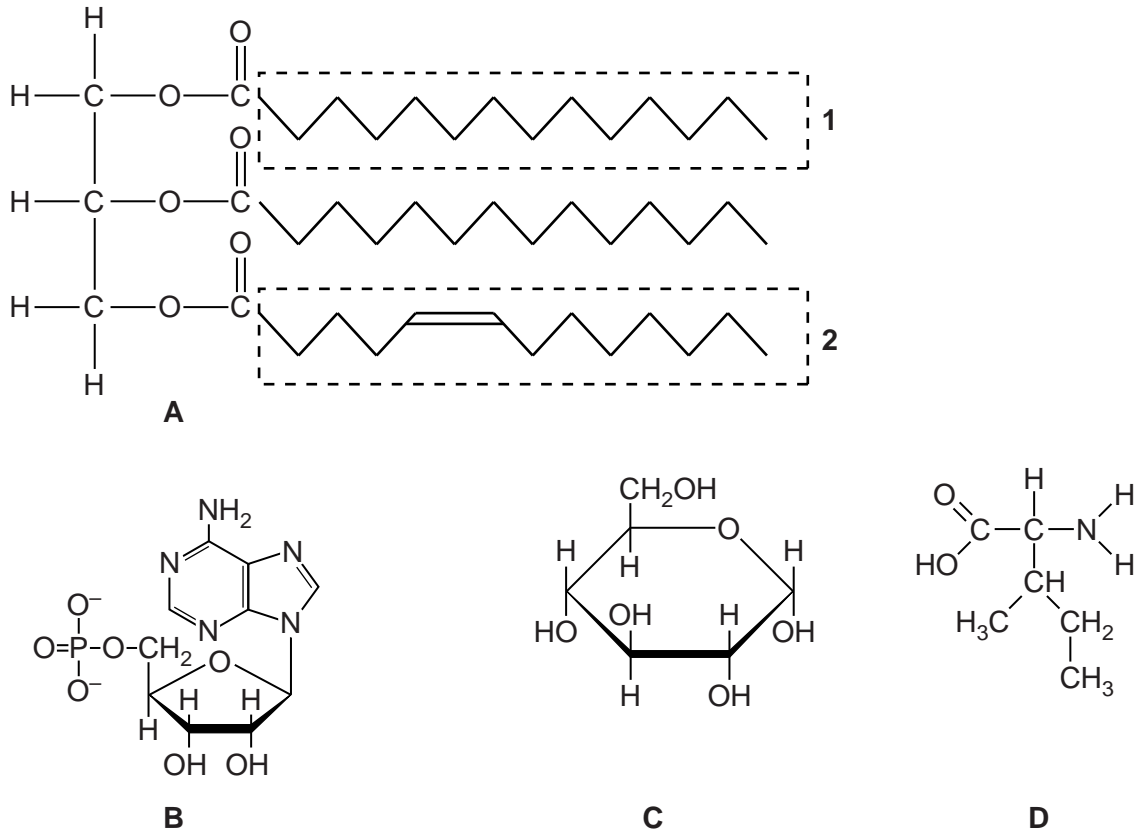


Fig. 1.1

(a) Give the letter, **A** to **D**, of the molecule in Fig. 1.1 which:

(i) is a nucleotide

(ii) can form peptide bonds

(iii) contains ester bonds.

[3]

(b) Some of the molecules in Fig. 1.1 can form polymers.

(i) Name a polymer which can be formed only from many molecules of **C**.

..... [1]

- (ii) State one way, visible in Fig. 1.1, in which the part labelled **1** of molecule **A** differs from the part labelled **2**.

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

- (iii) Molecule **D** can form macromolecules with other similar monomers.

These macromolecules have three dimensional shapes held in place by interactions or bonds other than those between adjacent monomers.

Name two of these interactions or bonds.

1.
2.
[2]

[Total: 7]