

8.3 The Heart

Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	8. Transport in Mammals
Topic	8.3 The Heart
Difficulty	Hard

Time allowed: 10

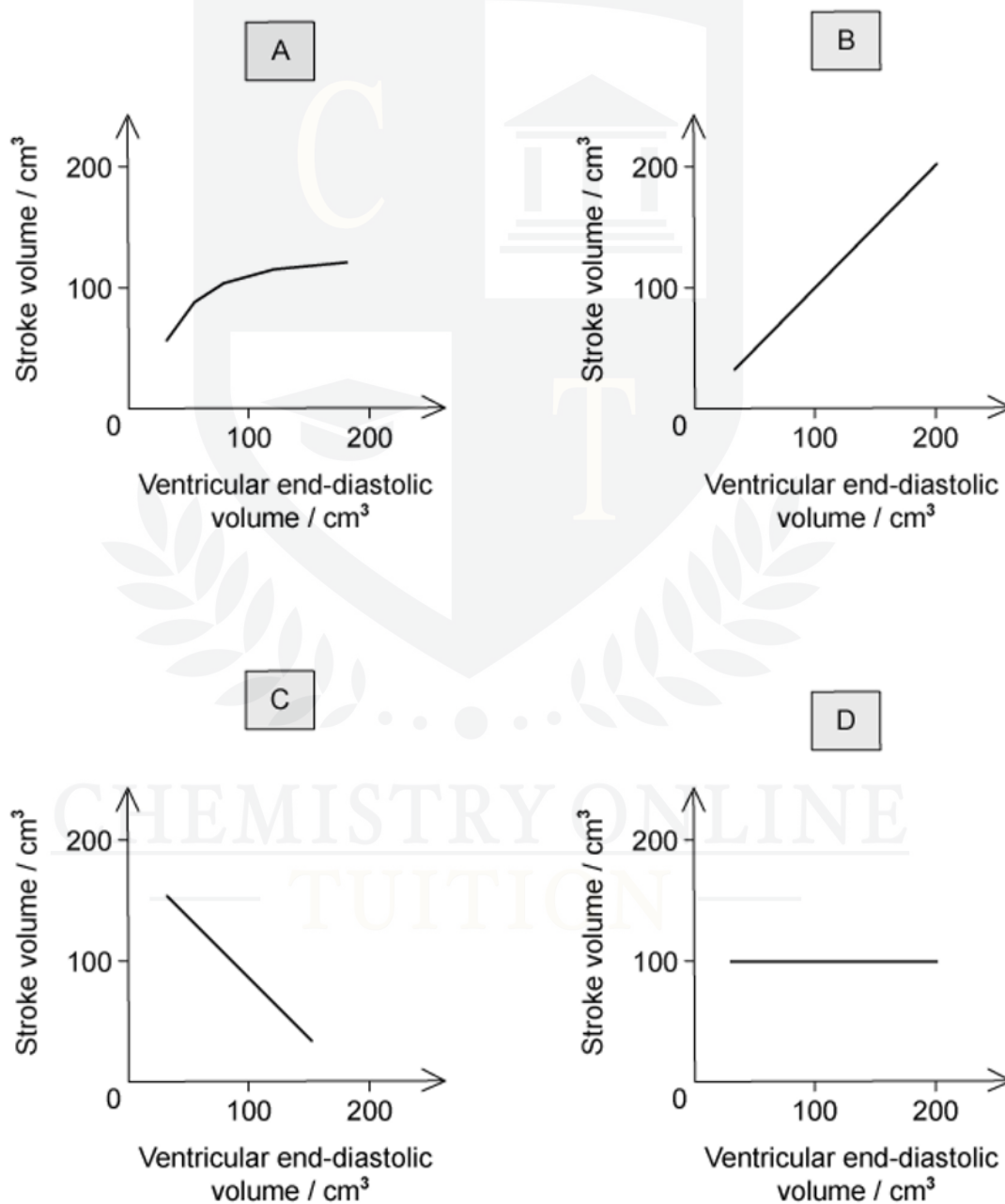
Score: /10

Percentage: /100

Question 1

The volume of blood pumped by each contraction of the ventricle is called the stroke volume. The volume of blood in the ventricle before systole is called the ventricular end-diastolic volume.

The following graphs show the relationship between stroke volume and ventricular end-diastolic volume. Which one is correct?

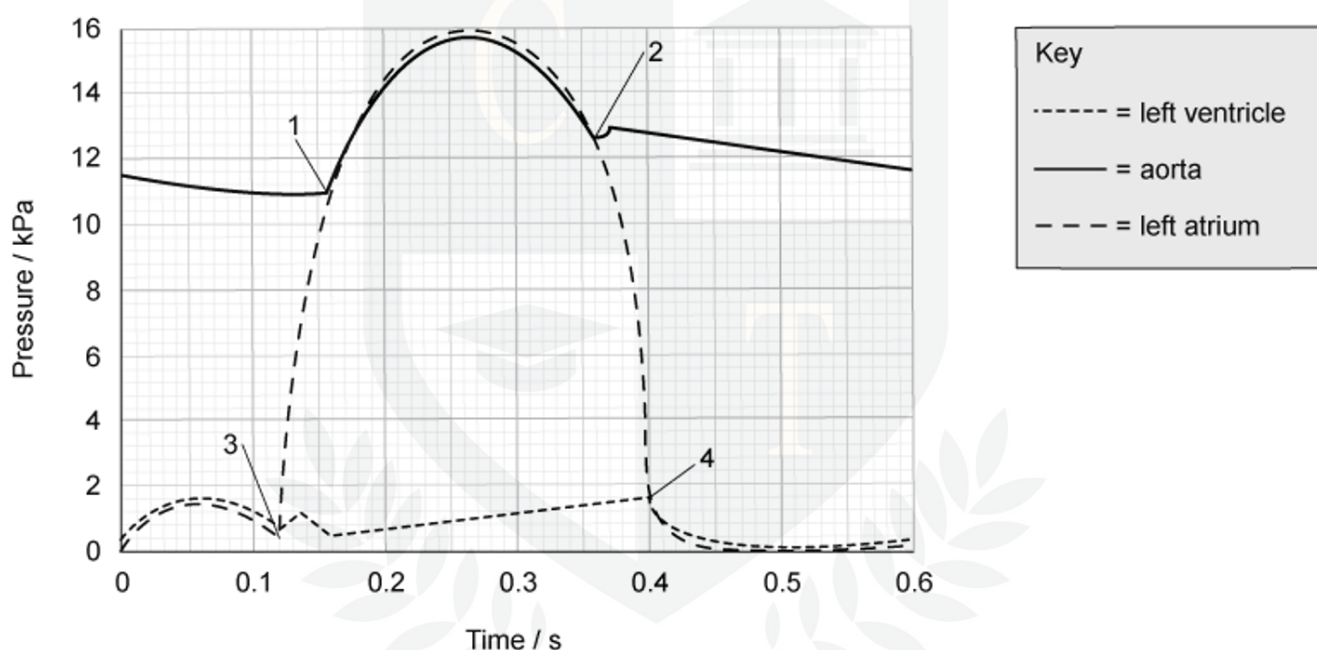


[1 mark]

Question 2

The graph shows the pressure changes in the left side of the heart over time. The cardiac cycle shown lasts 0.6s.

The points on the graph **1**, **2**, **3** and **4** show when the atrioventricular and semilunar valves are open or closed.



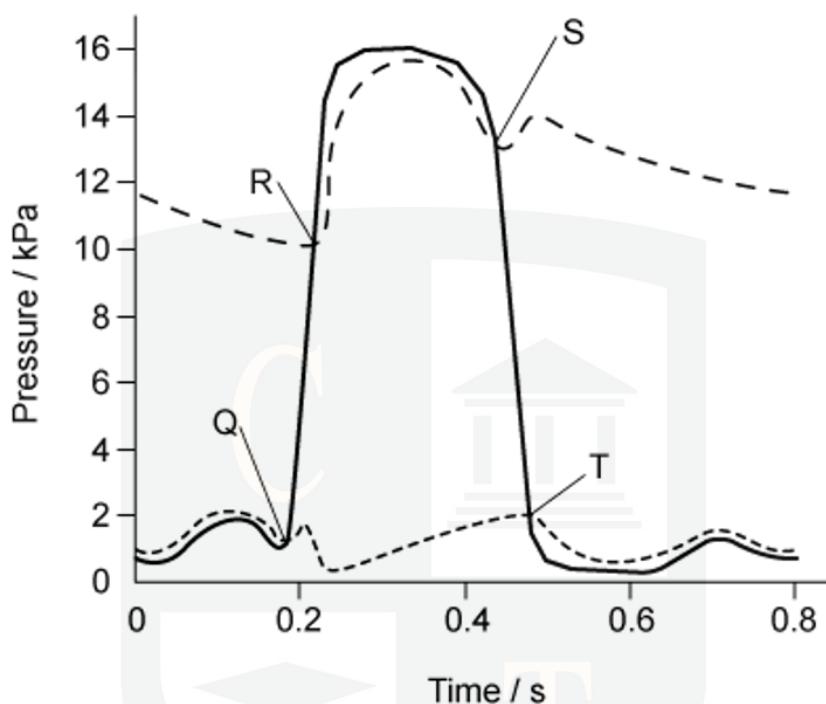
What is the total time in one cardiac cycle the atrioventricular valves and the semilunar valves are both closed at the same time?

- A** 0.21 s **B** 0.08 s **C** 0.04 s **D** 0.03 s

[1 mark]

Question 3

The graph shows the pressure changes during a cardiac cycle



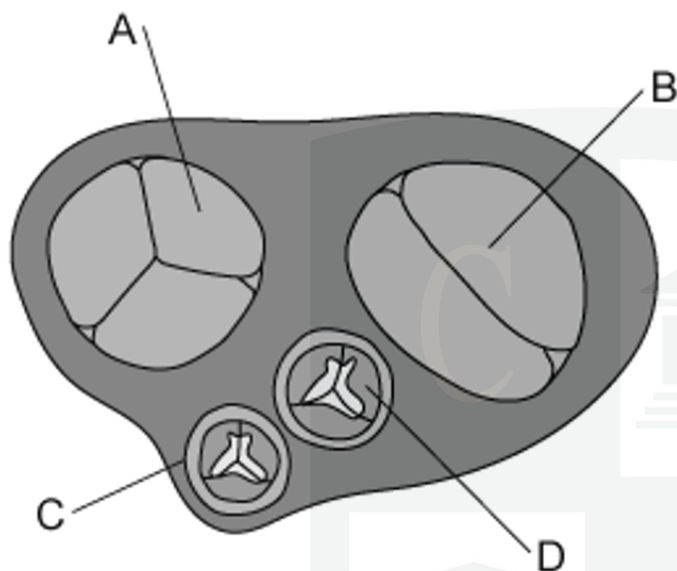
Which row correctly identifies Q, R, S and T?

	Q	R	S	T
A	semilunar valves close	atrioventricular valves open	atrioventricular valves close	semilunar valves open
B	semilunar valves open	atrioventricular valves close	atrioventricular valves open	semilunar valves close
C	atrioventricular valves close	semilunar valves close	semilunar valves open	atrioventricular valves open
D	atrioventricular valves close	semilunar valves open	semilunar valves close	atrioventricular valves open

[1 mark]

Question 4

The diagram shows an internal view of a human heart. The atria have been removed so the valves can be seen.



Which of the labels shows the valve that is pushed open when oxygenated blood is entering a ventricle?

[1 mark]

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Question 5

The graphs below show electrocardiogram (ECG) traces for normal heart activity (top) and abnormal heart activity (bottom).



Which of the following heart conditions is shown by the bottom ECG trace?

- A** Bradycardia
- B** ectopic heartbeat
- C** Tachycardia
- D** Fibrillation

[1 mark]

Question 6

The table below describes events during the cardiac cycle.

Which row is correct?

	nerve impulses from atrioventricular node (AVN) to	nerve impulses from Purkyne tissue (PT) to	nerve impulses from the sinoatrial node (SAN) to
A	PT	the ventricles	AVN
B	SAN	the atria	PT
C	PT	the ventricles	AVN
D	SAN	the atria	PT

[1 mark]

Question 7

After entering the right side of the heart, a red blood cell will pass through or pass by the following structures:

- 1 tricuspid valve
- 2 semilunar valve
- 3 right atrium
- 4 right ventricle
- 5 sinoatrial node

Which row in the table shows the correct order that the red blood cells will pass through?

- A** 4 → 3 → 5 → 2 → 1
- B** 5 → 3 → 1 → 4 → 2
- C** 2 → 1 → 5 → 3 → 4
- D** 5 → 1 → 2 → 3 → 4

[1 mark]

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Question 8

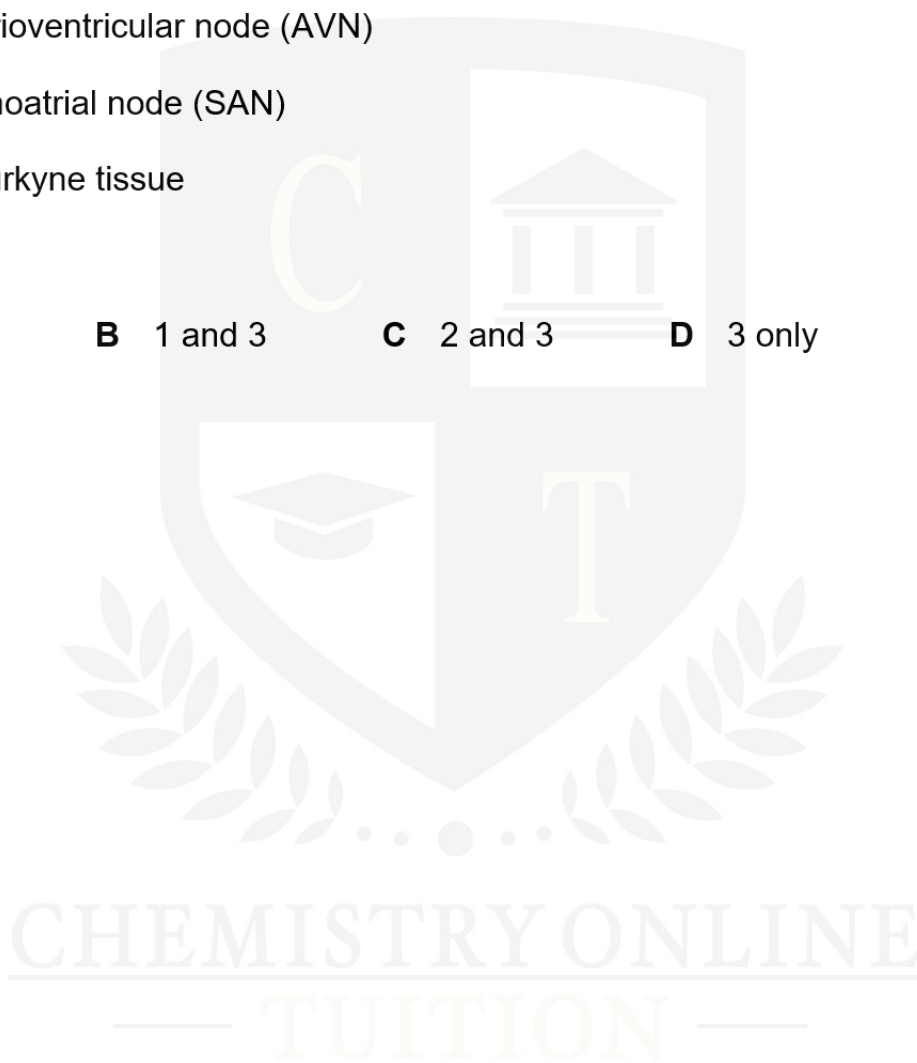
A disease that causes a lower than normal heart rate is called 'heart block'. When a doctor was treating a patient with this condition, he found that they had normal electrical impulses but these were not correctly conducted to the ventricles.

Which of the following could be faulty in the patient?

- 1 atrioventricular node (AVN)
- 2 sinoatrial node (SAN)
- 3 Purkyne tissue

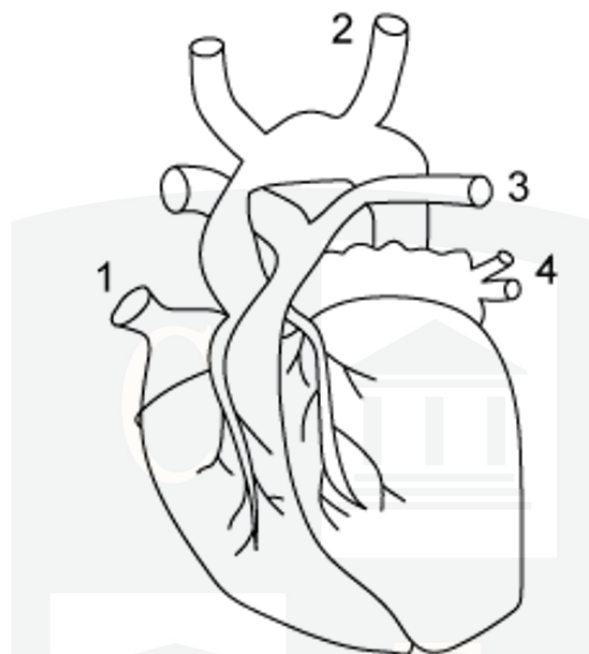
A 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 3 only

[1 mark]



Question 9

The diagram is of the external heart structure and blood vessels.



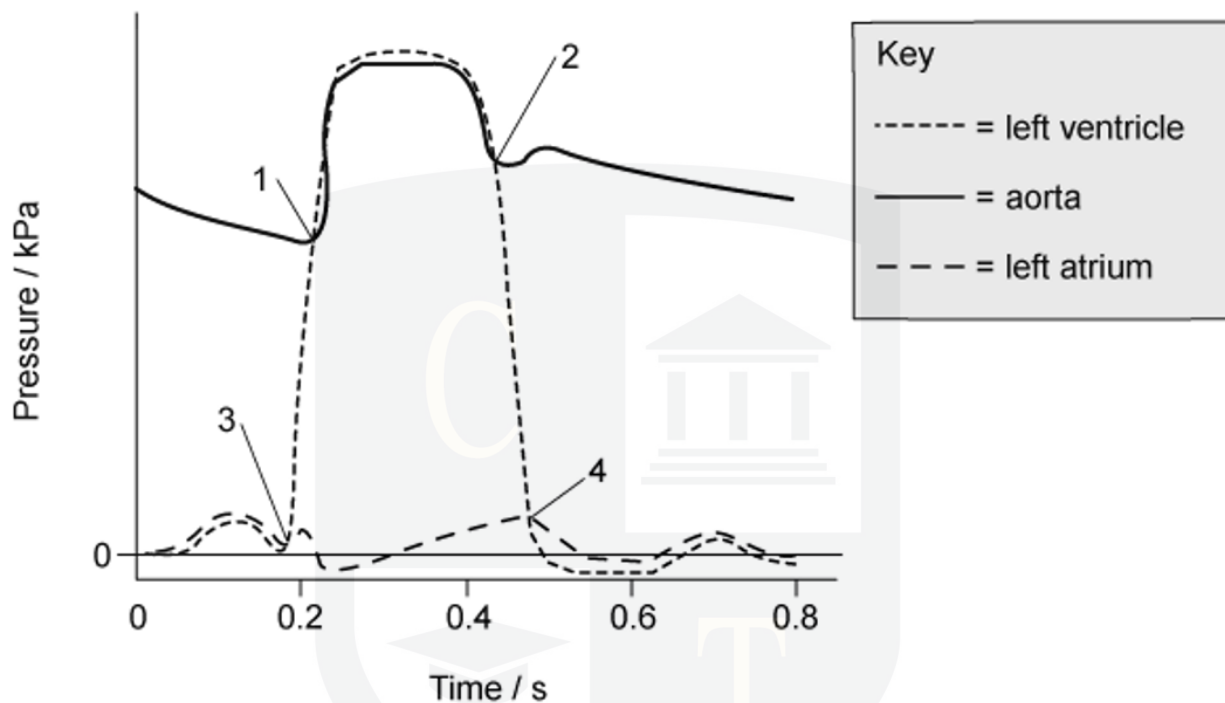
Which row of the table below shows the combination of blood vessels that supply blood to the heart and carry blood away from the heart?

	to the heart	away from the heart
A	2 and 3	1 and 4
B	4 and 1	2 and 3
C	3 and 4	1 and 2
D	1 and 2	3 and 4

[1 mark]

Question 10

The graph shows the pressure changes in the left side of the heart over time.



Which row of the table below shows what is happening at points **1**, **2**, **3** and **4** to the semilunar valves and the atrioventricular valves?

	semilunar valve		atrioventricular valve	
	Opens	closes	opens	closes
A	2	3	1	4
B	2	3	4	1
C	1	2	3	4
D	1	2	4	3

[1 mark]