Transport in animals Multiple Choice

Question Paper 1

Level	A Level
Subject	Biology
Exam Board	OCR
Module	Exchange and transport
Topic	Transport in animals
Booklet	Question Paper 1

Time allowed: **18 minutes**

Score: **/13**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E
>69%	56%	50%	42%	34%	26%

The aquatic crustacean *Daphnia magna* has a heart that pumps a blood-like liquid called haemolymph around the body cavity.

Which of the statements, **A** to **D**, describes the circulatory system of *Daphnia magna*?

A single closed

B single open

C double open

D double closed

[1]

Carbon dioxide release during respiration can affect the % oxygen saturation of haemoglobin.

The tertiary structure of haemoglobin is affected when carbon dioxide reacts with water to form carbonic acid. This reaction releases hydrogen ions.

Which of the statements, **A** to **D**, explains this change?

A. The release of hydrogen ions causes the pH to rise, which reduces haemoglobin's affinity for oxygen.
B. The release of hydrogen ions causes the pH to rise, which increases haemoglobin's affinity for oxygen.
C. The release of hydrogen ions causes the pH to fall, which increases haemoglobin's affinity for oxygen.
D. The release of hydrogen ions causes the pH to fall, which reduces haemoglobin's affinity for oxygen.

[1]

Which of the statements, **A** to **D**, explains why diastole follows systole in the mammalian heart?

A. Cardiac muscle is myogenic.

B. Cardiac muscle takes a short time to repolarise after being stimulated.

C. The aorta is capable of maintaining the pressure generated by the left ventricle.

D. The SAN receives impulses from the AVN.

[1]

The drug metoprolol prevents stimulation of post-synaptic receptors in the sympathetic nervous system.

Which of the following conditions could this drug be used to treat?

1 Muscle fatigue
2 Tachycardia
3 High blood pressure

A 1, 2 and 3

B. Only 1 and 2

C. Only 2 and 3

D Only 1

[1]

Which of the options, **A** to **D**, is a correct statement about tissue fluid?

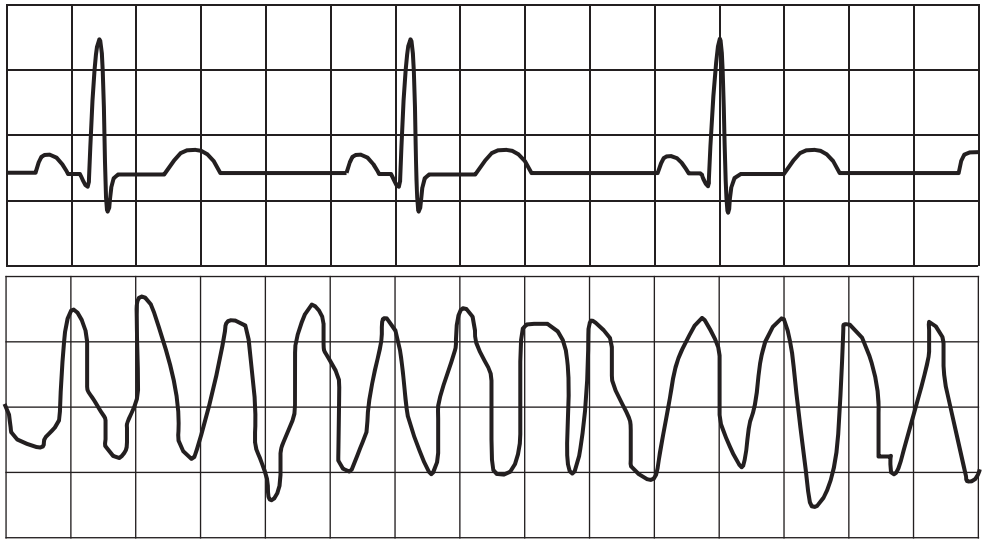
A. Tissue fluid carries carbon dioxide to muscle cells.

B. Oncotic pressure in the capillary causes tissue fluid formation from plasma.

C. Hydrostatic pressure in the capillary causes tissue fluid formation from plasma.

D. Tissue fluid is reabsorbed into the capillary by active transport. **[1]**

In the graph below, the top electrocardiogram (ECG) trace shows normal heart activity and the ECG trace below shows abnormal heart activity.



What is the heart condition represented by the bottom ECG trace?

A. fibrillation

B. tachycardia

C. ectopic heartbeat

D. bradycardia **[1]**

A student studied the structure of a blood vessel and found:

- an outer layer of collagen fibres,
- a thick middle layer of smooth muscle and elastic tissue,
- an innermost layer of endothelial cells.

Which of the options, **A** to **D**, identifies the type of blood vessel the student studied?

A. artery

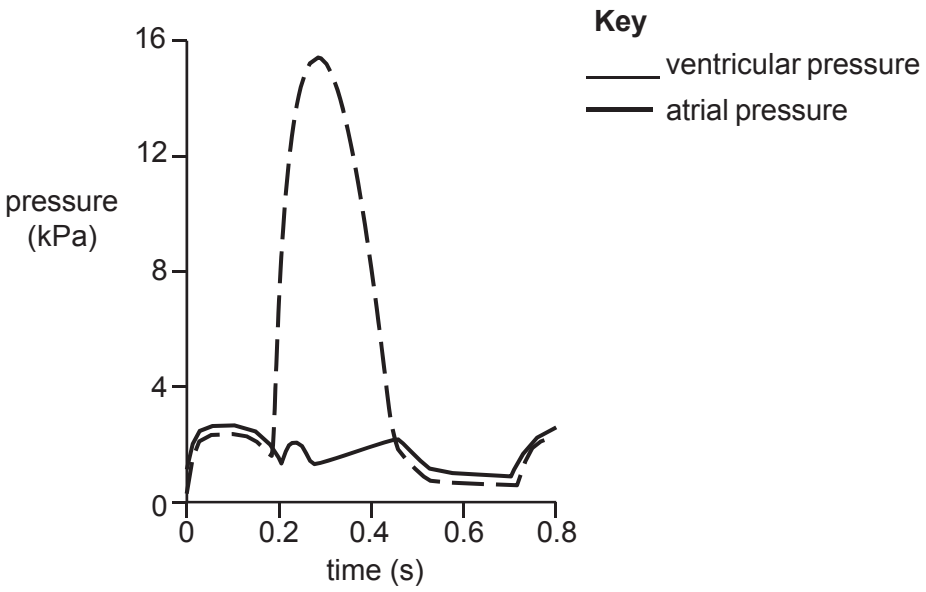
B. capillary

C. venule

D. vein **[1]**

Question 8

The pressure changes in one mammalian cardiac cycle are shown in the graph below.



Which of the following time periods, **A** to **D**, shows ventricular systole?

A 0.0 to 0.1s

B 0.2 to 0.3s

C 0.4 to 0.5s

D 0.6 to 0.8s **[1]**

Pressure varies in different parts of the mammalian circulatory system.

	Blood in aorta	Tissue fluid	Lymph	Blood in vena cava
Pressure				

Which of the following options, **A** to **D**, correctly completes the table above?

A high high low low

B high low high low

C high low low low

D high low low high

[1]

When you listen to a human heartbeat through a stethoscope you can hear a two stage ‘lub–dub’ sound.

Which of the following causes the first ‘lub’ component?

A. closing of the atrioventricular valves

B. sound of blood rushing into the atria

C. sound of blood rushing into the ventricles

D. closing of semilunar valves **[1]**

The following events occur when carbon dioxide enters an erythrocyte in a capillary.

1. Hydrogencarbonate ions diffuse into the plasma from the erythrocyte.
2. Dissociation of carbonic acid.
3. Carbon dioxide reacts with water forming carbonic acid.
4. Chloride ions diffuse into erythrocyte from plasma.

In which sequence do they occur?

	First step →			Final step
A	2	4	1	3
B	3	2	1	4
C	3	1	4	2
D	2	3	4	1

[1]

Which of the following statements correctly describes the mechanism behind water movement between plasma and tissue fluid at the venule end of a capillary?

A The hydrostatic pressure is greater than the oncotic pressure so water moves out of the capillary.

B The hydrostatic pressure is greater than the oncotic pressure so water moves into the capillary.

C The oncotic pressure is greater than the hydrostatic pressure so water moves out of the capillary.

D The oncotic pressure is greater than the hydrostatic pressure so water moves into the capillary. **[1]**

Blood vessels are adapted for their function.

Which of the following statements is/are true?

Statement 1: The walls of arteries near the heart contain a lot of elastic fibres so that they can stretch and recoil to maintain blood pressure.

Statement 2: The walls of the venules contain little muscle.

Statement 3: The walls of arteries contain a lot of muscle fibres to contract and generate pressure in the blood.

A 1, 2 and 3

B Only 1 and 2

C Only 2 and 3

D Only 1

[1]