8.1 The Circulatory System

Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	8. Transport in Mammals
Topic	8.1 The Circulatory System
Difficulty	Hard

Time allowed: **10**

Score: **/10**

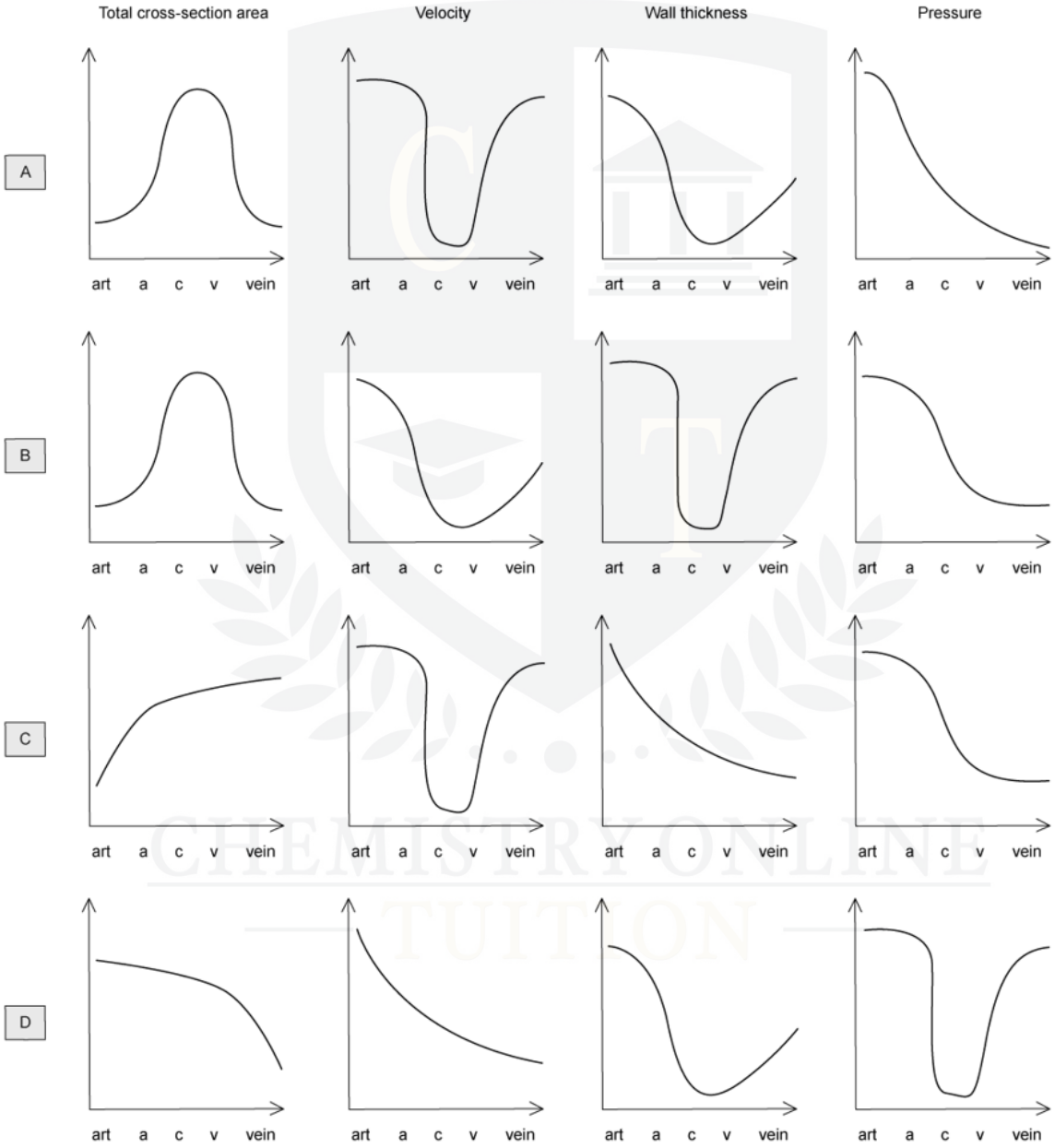
Percentage: **/100**

Question 1

The graphs below show how different conditions change through blood vessels in the following sequence:

artery (art) → arterioles (a) → capillaries (c) → venules (v) → veins (vein)

Which set of graphs are correct in relation to the sequence above?



[1 mark]

Question 2

Kwashiorkor is a disease caused by a lack of protein. The concentration of plasma protein is much lower in a sufferer than in a healthy individual. One symptom of kwashiorkor is oedema.

Which statement below correctly describes Kwashiorkor patients?

A The water potential is higher in the plasma than in the tissue fluid at the arterial end of the capillary bed.

B The water potential is lower in the plasma than in the tissue fluid at the arterial end of the capillary bed.

C Water is a polar molecule and is known as the 'universal solvent; so less proteins will dissolve in the plasma.

D The water potential of the blood plasma and tissue fluid are equal.

[1 mark]

Question 3

Water is the basis of blood, tissue fluid and lymph.

Which of the following statements describes properties of water than makes it useful as the fluid of the circulatory system?

1 specific latent heat of fusion

2 specific heat capacity

3 polar molecule

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

[1 mark]

Question 4

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

1 an innermost layer of endothelial cells

2 a thick middle layer of smooth muscle and elastic tissue

3 an outer layer of collagen fibres

Which vessel were they studying?

A Vein

B Capillary

C Venule

D Artery

[1 mark]

Question 5

Dissolved materials change the oncotic pressure of a fluid, which is related to water potential, ψ.

The following table shows some changes in the oncotic pressure and hydrostatic pressure in a capillary.

Which row shows the correct changes?

	pressure (mmHg)			
	arterial end of capillary		venous end of capillary	
	oncotic	hydrostatic	oncotic	Hydrostatic
A	−20	13	−20	33
B	−20	−13	−20	13
C	20	33	−20	13
D	−20	33	−20	13

[1 mark]

Question 6

Tissue fluid is formed from blood plasma in the capillaries.

Which statement below correctly identifies why?

A solute potential < osmotic pressure

B hydrostatic pressure > oncotic pressure

C oncotic pressure > hydrostatic pressure

D osmosis > hydrostatic pressure

[1 mark]

Question 7

Blood is made up of several different cells.

Which of the following statements about blood cells is incorrect?

A The majority of organelles in red blood cells are broken down by hydrolysis.

B Erythrocytes develop large number of ribosomes early in their differentiation.

C Neutrophils undergo mutation during differentiation.

D Erythrocytes and neutrophils are derived from the same stem cells.

[1 mark]

Question 8

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

Which of the following statements about the circulatory system is correct?

A single closed

B single open

C double closed

D double open

[1 mark]

Question 9

Blood travels in several major blood vessels.

Which row in the table shows the correct sequence for the flow of the blood vessels after blood has passed through the vena cava?

	pulmonary artery	pulmonary vein	aorta
A	3	2	1
B	1	3	2
C	2	3	1
D	1	2	3

[1 mark]

Question 10

Water moves between the plasma and the tissue fluid at the venule end of the capillary.

Which of the following statements correctly describes the mechanism behind this movement?

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

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

[1 mark]