

AQA, OCR, Edexcel

A Level

A Level Biology

The Heart and Circulatory
Questions

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Total Marks: /34

The Heart & Circulatory System

1. The circulatory system is made up of the heart and blood vessels. Their combined role is to transport blood carrying oxygen, hormones and nutrients to the respiring cells and then circulate the blood carrying carbon dioxide and waste products to the appropriate organs ready for excretion.

a) The circulatory system is made up of a number of different tissues as mentioned above.

i) The circulatory system is also known as a mass transport system. What is meant by this term? (1 mark)

ii) Fill in the table below by identifying the name of the blood vessel, which direction the blood flows through it and name one characteristic about its structure. (8 marks)

	Type	Away/Towards	Characteristics
A			Large proportion of smooth muscle and elastic tissue in the walls
B	VEIN		
C		AWAY	
D			The membrane is only one cell thick so there is a very short diffusion pathway.

iii) Why does blood vessel A require a large proportion of muscle and elastic tissue in their walls? (3 marks)

iv) What is the function of a valve in the circulatory system? (1 mark)

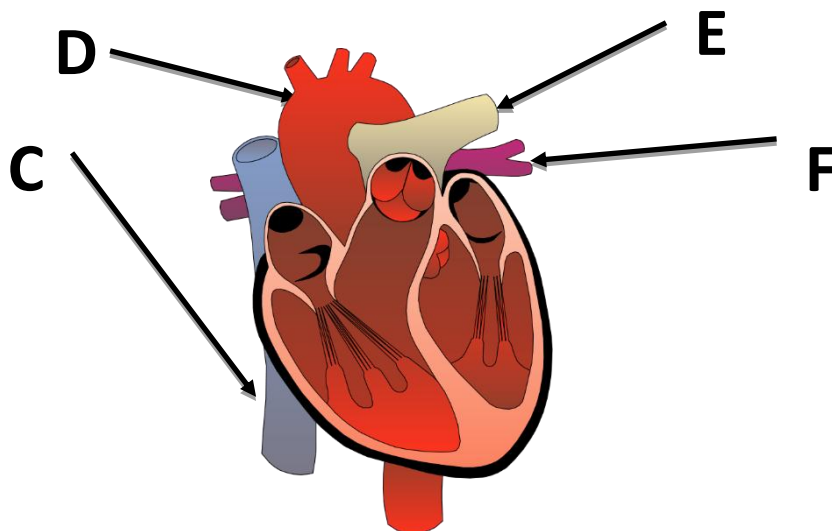
b) There are two circuits that make up the circulatory system.

i) Where do these two circuits transport blood to? (2 marks)

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2. The hearts job is to pump blood to all of the cells around the body. It does this by initiating regular contractions.

a) Knowledge of the structure of the heart is essential in understanding how the heart functions. The diagram on the next page shows the human heart.



i) Which chamber of the heart pumps blood around the body. Making reference to its structure, explain how it does this efficiently ? (3 marks)

ii) Using the diagram above to identify blood vessels C, D, E and F. (4 marks)

b) The cardiac cycle is the term used to describe the process of contraction and relaxation of the cardiac tissue.

i) When the atria contract what happens to the pressure and volume in the atria? (2 marks)

ii) What happens immediately after atrial contraction? (2 marks)

iii) Describe what happens as the ventricles contract? (3 marks)

c) How the heart functions can be measured in a number of different ways.

i) What is meant by the term stroke volume? (1 mark)

ii) An athlete has a cardiac output of 8750 ml per minute and a resting heart rate of 75 beats per minute. What is their stroke volume? (2 marks)

d) The cardiac cycle can be depicted using the graph show below.

i) Label sections A, B & C to identify whether the atria and ventricles are in systole or diastole. (3 marks)

