

Transport in animals practice questions

26 questions • 77 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 77

Circulatory systems **Spec 9.1**

1 Which statement describes the circulatory system? [1 mark]

- A . ☐ A pump and valves only
- B . ☐ Blood vessels, a pump and valves that ensure one-way flow of blood
- C . ☐ Blood vessels and a pump that allow blood to flow in both directions
- D . ☐ A pump that moves blood and air

2 (a) Name the pump of the circulatory system. [1] (b) State the job of valves in the circulatory system. [1] [2 marks]

3 **Supplement** [3 marks]

Describe the single circulation of a fish.

4 **Supplement** [4 marks]

Describe the double circulation of a mammal, starting with blood leaving the right ventricle.

5 **Supplement** [3 marks]

Explain the advantages of a double circulation compared with a single circulation.

The heart Spec 9.2

6 State three ways in which the activity of the heart may be monitored. [3 marks]

7 **Supplement** [3 marks]

Explain the importance of the septum in the heart.

8 **Supplement** [3 marks]

Explain why the muscle wall of the left ventricle is thicker than that of the right ventricle.

12 Discuss the roles of diet and exercise in reducing the risk of coronary heart disease. **[4 marks]**

Blood vessels **Spec 9.3**

13 Which type of blood vessel contains valves? **[1 mark]**

- A. ☐ Artery
- B. ☐ Capillary
- C. ☐ Vein
- D. ☐ Aorta

14 Describe three differences between the structure of an artery and the structure of a vein. **[3 marks]**

15 **Supplement** **[4 marks]**

Explain how the structure of arteries and veins is related to the pressure of the blood they carry.

State the function of capillaries and explain how their structure is related to this function.

17

Which blood vessel carries oxygenated blood from the lungs to the heart?

[1 mark]

- A. ☐ Pulmonary artery
- B. ☐ Pulmonary vein
- C. ☐ Vena cava
- D. ☐ Aorta

18

Name the blood vessel that (a) carries blood from the left ventricle to the body, (b) carries blood to the kidney, (c) carries deoxygenated blood from the right ventricle to the lungs.

[3 marks]

19

Supplement

[3 marks]

Name the blood vessel that (a) brings oxygenated blood to the liver, (b) brings blood from the small intestine to the liver, (c) takes blood away from the liver.

Blood

Spec 9.4

20

Which component of blood transports urea?

[1 mark]

- A. ☐ Red blood cells
- B. ☐ Platelets
- C. ☐ Plasma
- D. ☐ White blood cells

21 List the four components of blood. **[2 marks]**

22 Describe two features that help you to identify a red blood cell in a photomicrograph. **[2 marks]**

23 State the function of (a) red blood cells, including the role of haemoglobin, (b) white blood cells, (c) plasma. **[4 marks]**

24 State two roles of blood clotting. **[2 marks]**

25 **Supplement** **[4 marks]**

Describe the process of blood clotting.

A photomicrograph shows two types of white blood cell. One has a large round nucleus filling most of the cell. The other has a lobed nucleus. Name each type and state its function.

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

B B (1) Vessels, pump and valves for one-way flow

2. [2]

- heart (1)
- stop blood flowing backwards / ensure one-way flow of blood (1)

3. [3] **Supplement**

- blood is pumped from the heart to the gills (1)
- then flows to the body / organs (1)
- then returns to the heart / passes through the heart once per circuit (1)

4. [4] **Supplement**

- right ventricle pumps blood to the lungs (1) allow via pulmonary artery
- blood returns to the left atrium (1) allow via pulmonary vein
- left ventricle pumps blood to the body (1) allow via aorta
- blood returns to the right atrium (1) allow via vena cava

5. [3] **Supplement**

- blood returns to the heart after the lungs (1)
- so can be pumped again / pressure is increased (1)
- blood reaches body at high pressure so substances are delivered faster (1)
- lower pressure in the lungs does not damage capillaries (1)
- mammals have a high (metabolic / respiration) rate so need fast oxygen supply (1)
- Max 3

6. [3]

- ECG (1)
- pulse rate (1)
- listening to the sounds of the valves closing / using a stethoscope (1)

7. [3] **Supplement**

- it separates the left and right sides of the heart (1)
- oxygenated blood on the left and deoxygenated blood on the right (1)
- stops the blood mixing, so blood to the body is fully oxygenated (1)

8. [3] **Supplement**

- left ventricle pumps blood to the whole body (1)
- right ventricle pumps blood only to the lungs / a shorter distance (1)
- so left ventricle must produce a higher pressure / the lower pressure protects the lung capillaries (1)

9. [4] Supplement

- ventricles contract (1)
- atrioventricular valves close, stopping backflow into the atria (1)
- semilunar valves open (1)
- blood forced into the aorta and pulmonary artery (1)
- semilunar valves close when ventricles relax to prevent backflow (1)
- Max 4

10. [5] Supplement

- (a) $126 - 72 = 54$ (1)
- $54 \div 72 \times 100 = 75\%$ (1)
- (b) muscles respire faster / more aerobic respiration (1)
- need more oxygen and glucose (1)
- faster heart rate delivers these faster and removes carbon dioxide / lactic acid faster (1)

11. [4]

- (a) fatty deposits build up in the coronary arteries (1)
- which blocks / narrows the arteries so less blood flows (1)
- less oxygen / glucose reaches the heart muscle, (may cause) a heart attack (1)
- (b) genetic predisposition / age / sex (1) allow family history

12. [4]

- diet low in saturated fat reduces fatty deposits (1)
- less salt / more fruit and vegetables helps healthy arteries and blood pressure (1)
- exercise strengthens the heart muscle / lowers blood pressure (1)
- exercise helps control body mass (1)
- other risk factors such as age, sex or genes cannot be changed (1)
- Max 4

13. [1]

C C (1) Veins have valves

14. [3]

- artery wall thicker than vein wall (1)
- artery lumen narrower than vein lumen (1)
- veins have valves, arteries do not (1)

15. [4] Supplement

- arteries carry blood at high pressure (1)
- thick walls with muscle and elastic fibres withstand the pressure (1) allow narrow lumen maintains pressure
- veins carry blood at low pressure so walls are thinner / lumen is wide (1)
- valves in veins stop backflow (1)

16. [4] Supplement

- exchange of substances between blood and cells (1)
- wall one cell thick (1)
- short diffusion distance (1)
- large network / permeable walls (1)

17. [1]

B B (1) Pulmonary vein

18. [3]

- (a) aorta (1)
- (b) renal artery (1)
- (c) pulmonary artery (1)

19. [3] Supplement

- (a) hepatic artery (1)
- (b) hepatic portal vein (1)
- (c) hepatic vein(s) (1)

20. [1]

C C (1) Plasma transports urea

21. [2]

- red blood cells, white blood cells (1)
- platelets, plasma (1)

22. [2]

- no nucleus (1)
- small / round / pale in the middle / more numerous (1)
- allow biconcave shape

23. [4]

- (a) transport oxygen (1)
- haemoglobin combines with oxygen (1)
- (b) phagocytosis and antibody production (1)
- (c) transports blood cells / ions / nutrients / urea / hormones / carbon dioxide (1)

24. [2]

- prevents blood loss (1)
- prevents entry of pathogens (1)

25. [4] Supplement

- fibrinogen is a soluble protein in plasma (1)
- fibrinogen is converted to fibrin (1)
- fibrin is insoluble / forms fibres (1)
- fibres form a mesh that traps red blood cells to form a clot (1)

26. [4] Supplement

- large round nucleus = lymphocyte (1)
- produces antibodies (1)
- lobed nucleus = phagocyte (1)
- engulfs pathogens / phagocytosis (1)