



B2F Organisation: Foundation Tier Practice

AQA 8461 · Calculator allowed · about 80 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Complete the sentence. Cells with the same structure and function are grouped together to form a _____.

(Total for Question 1 is 1 mark)

- 2** Name the organ system that transports substances such as glucose and oxygen around the body.

(Total for Question 2 is 1 mark)

- 3** A student looks at plant cells and animal cells under a microscope. State one visible difference between a typical plant cell and a typical animal cell.

(Total for Question 3 is 1 mark)

- 4** Complete the table by naming the type of tissue in each row.

Row A: Tissue made of cells that contract and allow movement.

Row B: Tissue that transports water and dissolved minerals in a plant.

(a) Row A (1)

(b) Row B (1)

(Total for Question 4 is 2 marks)

5 Which organ in the human body pumps blood and has four chambers? Give the name.

(Total for Question 5 is 1 mark)

6 A teacher gives students a model showing four main types of tissues in the stomach. One type is epithelial tissue which lines the inside surface. State one function of epithelial tissue in the stomach.

(Total for Question 6 is 1 mark)

7 State the name of the small blood vessels where substances are exchanged between the blood and tissues.

(Total for Question 7 is 1 mark)

8 The blood is made up of plasma, red blood cells, white blood cells and platelets. Give one role of plasma.

(Total for Question 8 is 1 mark)

9 A student measures heart rate by counting beats in 30 seconds and then multiplying by 2 to get beats per minute. They count 36 beats in 30 seconds. Calculate the heart rate in beats per minute.

(a) Show the working and give the heart rate.

(2)

.....
(Total for Question 9 is 2 marks)

10 Explain why arteries have thicker walls than veins.

(Total for Question 10 is 2 marks)

- 11** The small intestine contains many villi which increase the surface area for absorption. State one adaptation of a villus that helps absorption.

(Total for Question 11 is 2 marks)

- 12** A student measures the mass of a sealed leaf before and after a 24 hour period in the dark. The mass decreased from 4.80 g to 4.20 g. Calculate the percentage decrease in mass. Show your working.

(Total for Question 12 is 3 marks)

- 13** Name the blood vessels that carry blood away from the heart and name the blood vessels that carry blood back to the heart. Give one example in each case.

(a) Name the vessels that carry blood away from the heart and give an example. (2)

(b) Name the vessels that carry blood back to the heart and give an example. (1)

(Total for Question 13 is 3 marks)

- 14** A student investigates how exercise affects breathing rate. They count breaths for 60 seconds at rest and after light exercise. At rest the student counts 14 breaths in 60 s. After light exercise they count 28 breaths in 60 s.

Calculate the difference in breathing rate and state one reason why breathing rate increases after exercise.

- (a)** Calculate the difference in breaths per minute. (2)

- (b)** State one reason why breathing rate increases after exercise. (2)

(Total for Question 14 is 4 marks)

-
- 15** Explain how root hair cells are adapted to absorb water and minerals from the soil. Give two clear points.

- (a)** Point 1 (2)

- (b)** Point 2 (2)

(Total for Question 15 is 4 marks)

- 16** A gardener measures the rate of water uptake by two plants. Plant A takes up 20 cm³ of water in 10 minutes. Plant B takes up 30 cm³ of water in 15 minutes.

Calculate the rate of water uptake for each plant in cm³ per minute and say which plant has the higher rate.

(a) Calculate the rate for Plant A. (2)

(b) Calculate the rate for Plant B. (2)

(c) State which plant has the higher rate or say if they are the same. (1)

(Total for Question 16 is 5 marks)

-
- 17** Explain how the structure of the lungs and the circulatory system work together to supply oxygen to body cells and remove carbon dioxide. In your answer you should describe features of the lungs and blood and explain how they enable gas exchange and transport.

(Total for Question 17 is 6 marks)

Mark scheme · B2F Organisation: Foundation Tier Practice

Question 1

- **B1** tissue cao
- **Answer: tissue**

Question 2

- **B1** the circulatory system (accept cardiovascular system)
- **Answer: the circulatory system**

Question 3

- **B1** plant cells have a cell wall or chloroplasts or a large central vacuole, animal cells do not, oe
- **Answer: Plant cells have a cell wall or chloroplasts or a large central vacuole; animal cells do not.**

Question 4

- (a) **B1** muscle tissue cao
- (a) **Answer: muscle tissue**
- (b) **B1** xylem or xylem tissue cao
- (b) **Answer: xylem**

Question 5

- **B1** heart cao
- **Answer: heart**

Question 6

- **B1** protects underlying tissues or secretes mucus or absorbs nutrients, oe
- **Answer: To protect underlying tissues or to secrete mucus or to absorb nutrients.**

Question 7

- **B1** capillaries cao
- **Answer: capillaries**

Question 8

- **B1** transports dissolved substances such as glucose, amino acids, hormones, or carbon dioxide, oe
- **Answer: Plasma transports dissolved substances such as glucose, amino acids, hormones or carbon dioxide.**

Question 9

- (a) **M1** method: converts 30 s count to per minute by multiplying by 2 or uses $60/30 \times 36$
- (a) **A1** 72 beats per minute cao
- (a) **Answer: 72 beats per minute**

Question 10

- **M1** states arteries carry blood at higher pressure than veins
- **A1** says thicker muscular and elastic walls help withstand higher pressure and maintain fast flow, oe
- **Answer: Because arteries carry blood at higher pressure, so they have thicker muscular and elastic walls to withstand the higher pressure and help maintain fast blood flow.**

Question 11

- **B1** thin wall (one cell thick) so short diffusion distance, or many capillaries to carry absorbed molecules away, or large surface area due to microvilli, oe
- **B1** contains blood vessels to transport absorbed nutrients away, oe
- **Answer: Any one of: thin wall (one cell thick) for short diffusion distance; many capillaries to take away absorbed molecules; or microvilli increasing surface area.**

Question 12

- **M1** method: calculates change in mass $4.80 - 4.20 = 0.60$ g or shows correct substitution for percentage change
- **M1** method: divides change by original mass: $0.60 / 4.80$
- **A1** 12.5% cao
- **Answer: 12.5%**

Question 13

- (a) **B1** arteries cao
- (a) **B1** example: aorta or pulmonary artery, oe
- **(a) Answer: Arteries; example: aorta (or pulmonary artery).**
- (b) **B1** veins, example: vena cava or pulmonary vein, oe
- **(b) Answer: Veins; example: vena cava (or pulmonary vein).**

Question 14

- (a) **M1** method: subtracts 14 from 28 or shows correct subtraction $28 - 14$
- (a) **A1** 14 breaths per minute cao
- **(a) Answer: 14 breaths per minute**
- (b) **B1** to take in more oxygen for increased respiration or to remove more carbon dioxide produced by increased respiration, oe
- (b) **B1** example linking to muscle activity: muscles need more energy so breathing rate increases to supply oxygen, oe
- **(b) Answer: Breathing rate increases to take in more oxygen and remove more carbon dioxide because muscles need more energy during exercise.**

Question 15

- (a) **M1** identifies an adaptation such as large surface area due to root hairs
- (a) **A1** explains how this increases the rate of absorption by providing more area for water and mineral uptake, oe
- **(a) Answer: They have many root hairs giving a large surface area so more water and minerals can be absorbed.**
- (b) **M1** identifies another adaptation such as thin cell walls or lots of mitochondria for active transport
- (b) **A1** explains how this helps uptake (thin wall shortens diffusion distance or mitochondria provide energy for active uptake of minerals), oe
- **(b) Answer: They have thin cell walls for short diffusion distance or many mitochondria to provide energy for active transport of minerals into the cell.**

Question 16

- (a) **M1** substitutes: $20 \text{ cm}^3 / 10 \text{ min}$ or shows method
- (a) **A1** 2.0 cm^3 per minute cao
- **(a) Answer: 2.0 cm^3 per minute**
- (b) **M1** substitutes: $30 \text{ cm}^3 / 15 \text{ min}$
- (b) **A1** 2.0 cm^3 per minute cao
- **(b) Answer: 2.0 cm^3 per minute**
- (c) **B1** they are the same (both 2.0 cm^3 per minute) cao
- **(c) Answer: They are the same; both 2.0 cm^3 per minute.**

Question 17

- **Level 3** (5-6): Detailed explanation that links lung structure and blood transport. Describes features such as alveoli with large surface area, thin walls, good blood supply; explains diffusion of oxygen into blood and carbon dioxide out; explains how oxygen is carried by red blood cells and carbon dioxide is carried away, and links these to supplying cells with O₂ for respiration and removing CO₂.
- **Level 2** (3-4): Some explanation with clear descriptions of at least two relevant features. May describe alveoli structure and mention blood transport but with limited linking of how these lead to efficient gas exchange.
- **Level 1** (1-2): Simple statements about lungs or blood, e.g. air enters lungs and blood carries oxygen, with little or no explanation of how structure supports function.
- **Indicative content:**
 - Alveoli provide a large surface area for gas exchange; many alveoli give a large total area
 - Alveoli and capillaries have thin walls (one cell thick) to give a short diffusion distance for gases
 - Good blood supply around the alveoli (dense capillary network) maintains concentration gradients
 - Oxygen diffuses from alveoli into blood and is carried by red blood cells (haemoglobin) to body cells
 - Carbon dioxide diffuses from blood into alveoli to be exhaled; CO₂ is transported in blood plasma or as hydrogen carbonate ions
 - These features together ensure oxygen reaches cells for respiration and CO₂ is removed, maintaining efficient gas exchange