

**GCSE Biology A (Gateway)**  
**J247/03** Paper 3 Biology (Higher Tier)

**Question Set 22**

Multiple Choice Questions

B2: Scaling Up

1. Look at the table. Which row describes active transport?

|   | Only occurs across a membrane | Uses ATP | Only moves substances from |                           |
|---|-------------------------------|----------|----------------------------|---------------------------|
|   |                               |          | low to high concentration  | high to low concentration |
| A |                               | ✓        |                            | ✓                         |
| B | ✓                             | ✓        | ✓                          |                           |
| C | ✓                             |          | ✓                          |                           |
| D | ✓                             | ✓        |                            | ✓                         |

Your answer

[1]

2. Look at some of the stages in mitosis.

- 1 The nuclear membrane forms.
- 2 The nuclear membrane breaks down.
- 3 Chromosomes separate.
- 4 Chromosomes line up on the equator.

What is the correct order of these stages during mitosis?

- A            1 → 3 → 2 → 4
- B            1 → 4 → 3 → 2
- C            2 → 4 → 3 → 1
- D            3 → 2 → 4 → 1

Your answer

[1]

3

A student uses a simple potometer to study the effect of different temperatures on the cut shoot of a plant.

What does the potometer actually measure?

- A Volume of water evaporating from the leaves of the shoot
- B Volume of water produced by respiration in the shoot
- C Volume of water taken up by the shoot
- D Volume of water used in photosynthesis in the shoot

Your answer

[1]

4

A plant cell is placed in a solution with a higher solute concentration than the cell contents.

What will happen to the plant cell?

- A Absorb water until it bursts.
- B Absorb water until it is turgid.
- C Lose cytoplasm and shrink.
- D Lose water and become flaccid.

Your answer

[1]

5

The surface area of a single red blood cell is  $1.5 \times 10^{-4} \text{ mm}^2$ .  
The volume is  $1 \times 10^{-7} \text{ mm}^3$ .

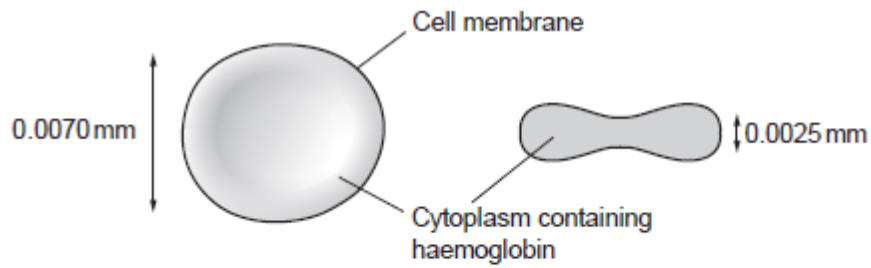
What is the surface area to volume ratio of a red blood cell?

- A 0.0015 : 1
- B 0.7 : 1
- C 1.5 : 1
- D 1500 : 1

Your answer

[1]

6 The diagram shows a red blood cell.



|   | Distance oxygen travels to get to haemoglobin from blood plasma | Surface area to volume ratio | Nucleus present |
|---|---|------------------------------|-----------------|
| A | Large   | Small                        | Yes             |
| B | Short   | Large                        | Yes             |
| C | Short   | Large                        | No              |
| D | Large   | Large                        | No              |

Which row in the table shows how red blood cells are adapted for transport of oxygen?

Your answer

[1]

7 Which is a function of carrier proteins in a cell membrane?

- A Transfer impulses across a synapse
- B Transfer molecules by active transport
- C Transport amino acids in protein synthesis
- D Transport molecules around the blood

Your answer

[1]

8 Sieve plates are structures found in plants.

What is their location and function?

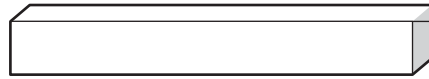
- A Found in phloem and allow movement of sucrose
- B Found in phloem and allow movement of water
- C Found in xylem and allow movement of sucrose
- D Found in xylem and allow movement of water

Your answer

[1]

9 An experiment is carried out to find the concentration of potato tissue.

Four chips are cut from a potato.



At the start, each chip is 50 mm long, 10 mm wide and 10 mm high. Each chip is put in a different sucrose solution **A**, **B**, **C** and **D**.

The volumes of the chips are calculated after 1 hour.

| Sucrose solution | Volume of chip (mm <sup>3</sup> ) |
|------------------|-----------------------------------|
| <b>A</b>         | 50                                |
| <b>B</b>         | 500                               |
| <b>C</b>         | 5000                              |
| <b>D</b>         | 50 000                            |

Which sucrose solution has the same concentration as the potato tissue?

Your answer

[1]

**Total Marks for Question Set 2: 19**

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