1.11 Transport in and out of Cells: 10-minute Pack

AQA 8464 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 As well as temperature, other factors affect the rate of diffusion. State two other factors that affect the rate of diffusion.

(Total for Question 1 is 2 marks)

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2 Diffusion is one of the ways that substances move into and out of cells.

(a) Define diffusion. **(2)**

(b) Give one example of diffusion occurring in the human body. **(1)**

(Total for Question 2 is 3 marks)

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3 As organisms increase in size, their surface area to volume ratio decreases. Explain why large multicellular organisms need specialised exchange surfaces and transport systems.

(Total for Question 3 is 4 marks)

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Mark scheme · 1.11 Transport in and out of Cells: 10-minute Pack

Question 1

any one from: the concentration gradient (the difference in concentration between the two areas); the surface area of the membrane or exchange surface; the diffusion distance (thickness of the membrane), oe **B1**

any second, different factor from the list above, oe **B1**

Answer: Any two from: the concentration gradient (difference in concentration); the surface area of the membrane; the distance (thickness of the membrane) across which particles must diffuse.

Question 2

(a) (net) movement of particles (molecules/ions) from an area of higher concentration to an area of lower concentration, oe **B1**

(a) movement continues until the concentration is the same throughout / an equilibrium is reached, oe **B1**

(a) Answer: Diffusion is the net movement of particles from an area of higher concentration to an area of lower concentration, until the concentration is the same throughout.

(b) any correct named example, e.g. oxygen diffusing from the alveoli into the blood; carbon dioxide diffusing from the blood into the alveoli; glucose diffusing from the small intestine into the blood, oe **B1**

(b) Answer: Oxygen diffuses from the air in the alveoli into the blood in the surrounding capillaries.

Question 3

single-celled organisms have a large surface area to volume ratio, oe **B1**

so diffusion alone is fast enough to supply/remove substances at the rate needed by the cell, oe **B1**

large multicellular organisms have a (relatively) small surface area to volume ratio, oe **B1**

so diffusion alone would be too slow to meet the needs of all their cells, meaning they need specialised exchange surfaces and transport systems, oe **B1**

Answer: Single-celled organisms have a large surface area to volume ratio, so diffusion alone can supply their needs. Large multicellular organisms have a small surface area to volume ratio, so diffusion alone would be too slow, and they need specialised exchange surfaces and transport systems instead.

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