

GCSE Biology B (Twenty First Century Science)

J257/03 Breadth in Biology (Higher)

Question Set 25

1

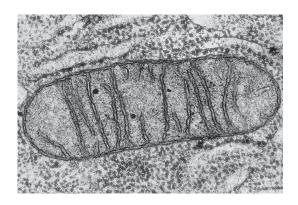
The partially permeable membrane of the cell allows the reactants of respiration to enter the cell and the products to leave.

(a) Complete the table to explain how each of these substances is transported into or out of cells.

Tick (\checkmark) **one** box in each row.

| Substance | Diffusion | Osmosis | Active transport |
|--------------------------------|-----------|---------|------------------|
| Carbon dioxide out of the cell | | | |
| Oxygen into the cell | | | |
| Water out of the cell | | | |

(b) This image is of a mitochondrion.



- (i) What type of microscope would be used to take this image?
- (ii) Explain how this type of microscope has increased our understanding of structures suchas mitochondria.
- (iii) Human heart muscle contracts on average 80 times per minute.

Suggest why heart muscle cells contain a large number of mitochondria.

[1]

[3]

[1]

[2]

| Total Marks for Question Set 25: 9 | | | | |
|------------------------------------|--|---------------|-----|--|
| | Mitochondrial mass of liver | =kg | [2] | |
| | | | | |
| | Calculate the mass of the liver that is made of hepatocyte | mitochondria. | | |
| | It is estimated that 18% of each hepatocyte is mitochondri | a. | | |

Hepatocytes are one type of cell found in the liver. They make up approximately

A human liver has a mass of approximately 1.3 kg.

75% of the liver mass.

(c)



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