

Cell Biology H

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Q1.

- (a) In humans there are two types of cell division: **mitosis** and **meiosis**.

The table below gives statements about cell division.

Tick (✓) **one** box in each row to show if the statement is true for mitosis only, for meiosis only, or for both mitosis **and** meiosis.

The first row has been done for you.

Statement	Mitosis only	Meiosis only	Both mitosis and meiosis
How cells are replaced	✓		
How gametes are made			
How a fertilised egg undergoes cell division			
How copies of the genetic information are made			
How genetically identical cells are produced			

(4)

- (b) Stem cells can be taken from human embryos.

In therapeutic cloning, an embryo is produced that has the same genes as the patient.

- (i) Name **one** source of human stem cells, other than human embryos.

(1)

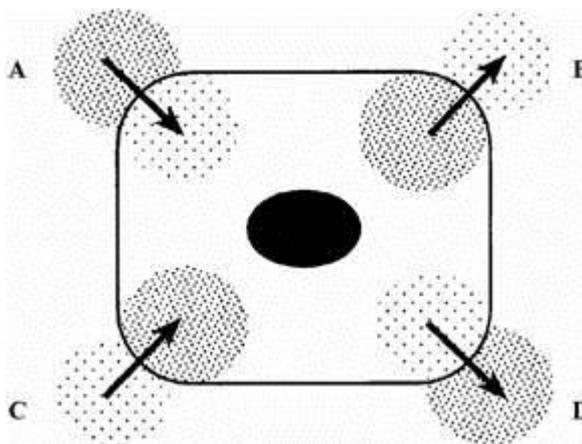
- (ii) Stem cells from embryos can be transplanted into patients for medical treatment.

Give **one** advantage of using stem cells from embryos, compared with cells from the source you named in part (i).

(1)

Q2.

- (a) The diagram shows four ways in which molecules may move into and out of a cell. The dots show the concentration of molecules.



The cell is respiring aerobically.
Which arrow, **A**, **B**, **C** or **D**, represents:

- (i) movement of oxygen molecules; _____
(ii) movement of carbon dioxide molecules? _____

(2)

- (b) Name the process by which these gases move into and out of the cell.

(1)

- (c) Which arrow, **A**, **B**, **C** or **D**, represents the active uptake of sugar molecules by the cell?

Explain the reason for your answer.

(2)

(Total 5 marks)

Mark schemes

Q1.

(a)

	Mitosis only	Meiosis only	Both mitosis and meiosis
How cells are replaced	✓		
How gametes are made		✓	
How a fertilised egg undergoes cell division	✓		
How copies of the genetic information are made			✓
How genetically identical cells are produced	✓		

*if more than one tick per row then no mark
ignore first row*

1
1
1
1

(b) (i) (adult) bone marrow

accept (umbilical) cord blood, skin, amniotic fluid / membrane

1

(ii) cells will not be rejected by the patient's body (if they have been produced by therapeutic cloning)

allow easier to obtain linked to embryo stem cells

or

(embryo stem cells) can develop into many different types of cells

allow doesn't need an operation linked to bone marrow

or

(embryo stem cells) not yet differentiated / specialised or undifferentiated

accept embryo cells are pluripotent

1

[6]

Q2.

(a) (i) A

(ii) B

for 1 mark each

2

(b) diffusion

(reject osmosis)

for one mark

1

(c) C

because uptake against a concentration / diffusion gradient

(reject osmosis)

(if C not given, then idea of movement essential)

for 1 mark each

2

[5]

[5]