

Question 1

(c) After a baby is born, stem cells may be collected from the umbilical cord. These can be frozen and stored for possible use in the future.

(i) What are stem cells?

(2)

(ii) Suggest why it is ethically more acceptable to take stem cells from an umbilical cord instead of using stem cells from a 4-day-old embryo produced by In Vitro Fertilisation (IVF).

(1)

(iii) Stem cells taken from a child's umbilical cord could be used to treat a condition later in that child's life.

Give **one** advantage of using the child's own umbilical cord stem cells instead of using stem cells donated from another person.

(1)

(iv) Why would it **not** be possible to treat a genetic disorder in a child using his own umbilical cord stem cells?

(1)

(Total 10 marks)

Mark schemes

Q1.

- (c) (i) any **two** from:
- cells that are able to divide
 - undifferentiated cells / not specialised
 - can become other types of cells / tissues **or** become specialised /differentiated
- allow pluripotent*
- 2
- (ii) 4-day embryo is a (potential) human life
- or**
- destroying/damaging (potential) human life
- allow cord would have been discarded anyway*
- ignore reference to miscarriage*
- allow cannot give consent*
- 1
- (iii) perfect tissue match **or** hard to find suitable donors
- allow same/matching antigens*
- allow no danger of rejection*
- allow no need to take immunosuppressant drugs (for life)*
- ignore genetically identical **or** same DNA*
- 1
- (iv) stem cells have same faulty gene / allele / DNA / chromosomes
- allow genetically identical*
- ignore cells have the same genetic disorder*
- 1

[10]