

## **GCSE Biology B (Twenty First Century Science)**

J257/04 Depth in biology (Higher Tier)

**Question Set 17** 

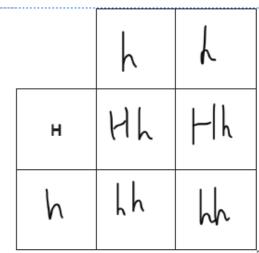
- 1 Huntington's disease is caused by a faulty allele of a single gene.
  - (a) The allele that causes the disease is dominant. The other allele is recessive.

A couple are planning to have a baby.

(b)

- The female's genotype is heterozygous dominant.
- The male's genotype is homozygous recessive.

Complete the Punnett square to show the predicted proportion of their offspring that will have Huntington's disease.



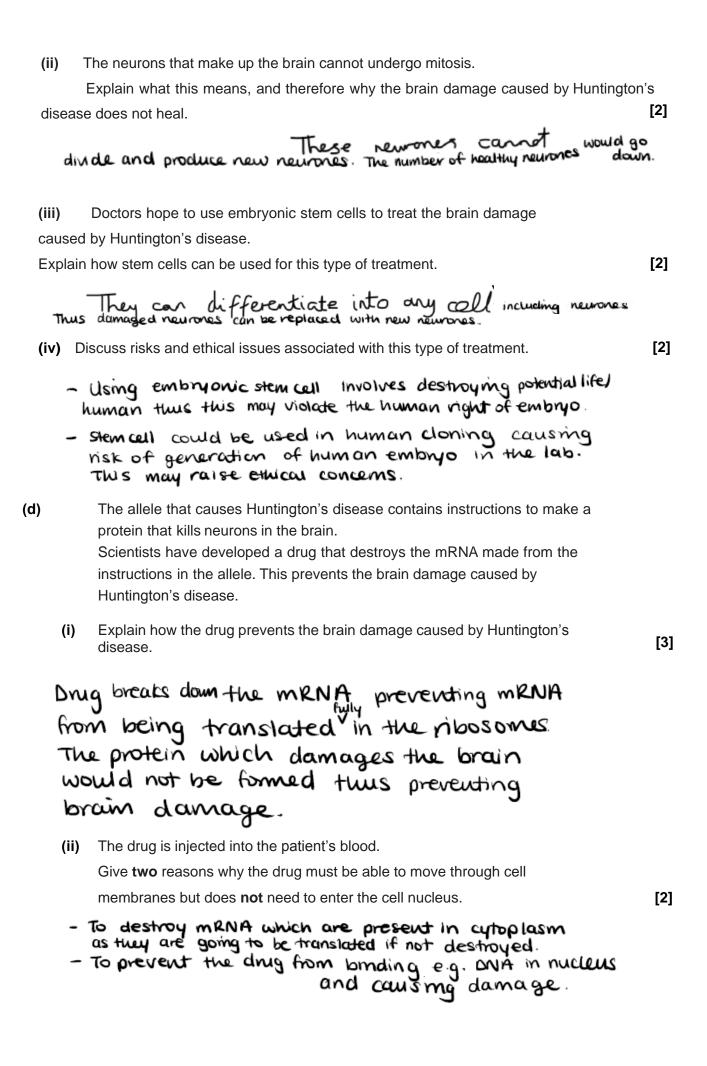
Proportion of offspring with Huntington's disease = ...... 50/. ..... [2]

Give **two** reasons why a Punnett square **cannot** be used to predict most of a person's features.

- Lethal alleles can cause death before birth thus the distribution of phenotypes would be different.
- A single feature can be determined by multiple genes and the effect of each gene can be gracled.
- There is a potential chance of mutation leading to feature not inherited from the parents.
- (c) When a person has Huntington's disease, neurons in their brain start to die. The person becomes confused. Eventually they cannot control their body movements and cannot speak.
  - (i) Explain why it is difficult to investigate brain function in a person with Huntington's disease.

[2]

It causes damage to certain brain cells.





OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

opportunity.

of the University of Cambridge