GCSE Biology A (Gateway)

J247/04 Biology A B4-B6 and B7 (Higher Tier)

Question Set: 10

1 Retinitis pigmentosa is a genetic condition that affects the eyes.

It is caused by a mutation to a gene. This mutation produces a recessive allele.

The condition causes rod cells in the retina to break down.

(a) Explain the meaning of these terms.

Gene
Length of DNA that codes for a protein

Allele
A version of a gene

[2]

(b) **(i)** Two people who are heterozygous for retinitis pigmentosa are expecting a baby.

Draw a genetic diagram to calculate the probability that the baby will have the condition.

Use R for the normal allele and r for the allele for retinitis pigmentosa.

	R	r
R	RR	Rr
r	Rr	rr

1/4 = 25%

[3]

(ii) If the baby has retinitis pigmentosa, it will have normal colour vision but will not be able to see well in dim light.

Explain why.

Only rod cells are broken down and they only see in black and white - Also, rod cells work good in dim light so vision won't have much colour.

[3]

(c) **(i)** Explain why stem cells could be used as a treatment for this condition.

Stem cells can still differentiate to become rod cells.

[2]

(ii) Why is it an advantage to use stem cells from the patient rather than from another person?

They would not be detected as foreign cells so won't be rejected by body.

[1]

Total Marks for Question Set 10: 11