Mark schemes

	4	
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(a) rr

allow homozygous recessive

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(b) male gametes correct: **R** and **r**

1

all four offspring genotypes correctly derived from gametes (given) allow 1 mark for 2 or 3 correct

2

(c) correct ratio from the figure allow 3:1 if no answer to (b)

1

(d) having (two) different alleles (of a gene)

ignore example(s)

do not accept having two different genes

1

- (e) any **two** from:
 - other scientists not aware of his work or work published in obscure journal

allow work lost for many years

- other theories accepted at the time allow eg theory of blending inheritance ignore religion
- not considered to be a scientist or not eminent or not respected
 allow he was only a monk
 allow he was not believed
- Mendel's (mathematical) approach was novel concept allow his work was not understood or no other scientist had similar ideas allow his results were not corroborated (at the time)
- peas gave unusual results compared with other species allow Mendel only worked on pea plants allow insufficient results / research
- new discoveries made Mendel's work relevant allow specific discoveries

2

Q2.

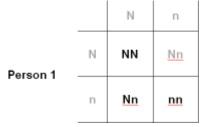
- (a) an allele expressed only if a person has two copies of the allele
- 1

(b) male with MSUD

allow equivalent statements e.g. affected male **or** MSUD male **or** man with the disease

1

(c) mark with (d), (e)



3 correct = 2 marks

2 or 1 correct = 1 mark

2

(d) mark with (c), (e)

does not have MSUD

allow equivalent statements – eg normal **or** not affected **or** healthy ignore carrier

1

(e) mark with (c), (d)

correct percentage from Figure 2

if no answer in part (c) allow 25%

1

1

- (f) dominant
- (g) DNA

allow deoxyribonucleic acid allow nucleotide(s)

1

(h) proteins

[9]

Q3.

(a)

	Sexual reproduction	Asexual reproduction
Cell division occurs	✓	✓
Fertilisation occurs	✓	
Genes are passed on from parent to offspring	✓	✓
Offspring are genetically identical to each other		✓

allow 1 mark for 1 or 2 correct rows ignore 'x' in blank boxes

(b) pollen (grain)

allow nucleus in pollen (grain)

(c) between 3 and 4 hours

(d) 5 hours

6 hours

(e) 2

(f) 4

[8]

2

1

1

1

1