

Mark schemes

Q1.

- (a) **r r**
allow homozygous recessive
 1
- (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)

		N	n
	N	NN	<u>Nn</u>
Person 1	n	<u>Nn</u>	<u>nn</u>

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

- (f) dominant

1

- (g) DNA

*allow deoxyribonucleic acid
allow nucleotide(s)*

1

- (h) proteins

1

[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

2

(b) pollen (grain)

allow nucleus in pollen (grain)

1

(c) between 3 and 4 hours

1

(d) 5 hours

1

6 hours

1

(e) 2

1

(f) 4

1

[8]