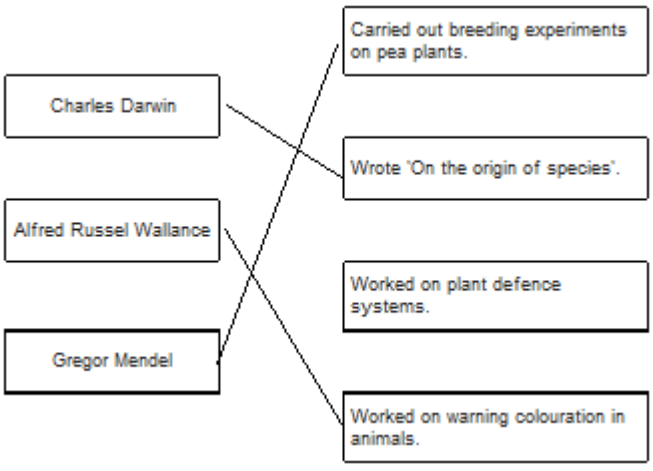
M1.

(a)



3

(b) a gene

allow allele

1

(c) 4

1

(d) correct derivation of children's genotypes

1

identification of children with cystic fibrosis (dd)

1

0.25

allow ecf

allow ¼ / 25% / 1 in 4 / 1:3

1

*do **not** accept 1:4*

(e) heterozygous

1

[9]

M2.(a) Taking cuttings from plants

1

(b) (i) Adult cell cloning

1

(ii) an egg cell

1

(iii) nucleus

1

(iv) an electric shock

1

(v) uterus / womb

accept phonetic spelling

1

(c) any **two** from:

- unethical / immoral

  allow 'rights' of the cloned child

  allow against religious teachings
- cloned child would have to give up a kidney
- possible operation complications.

  allow illegal

  allow parents may not want another child

  allow a long time to wait (for the kidney)

2

[8]

M3.(a) selection

1

(b) (i) 4

1

(ii) ground finch / lives on the ground

1

(only) eats seeds

*allow eg eats seeds on / from the ground for **2** marks*

1

(c) Lamarck

1

[5]

M4.(a) (i) gamete(s)

ignore reproductive cells

1

(ii) womb / uterus

allow phonetic spellings

1

(b) (i) are formed from the same original embryo

1

(ii) embryo transplantation

1

(iii) any **one** from:

- (calves will have some) genes / DNA from bull / sperm
  allow not all genes from the cow
- idea that sexual reproduction produces variation
  allow may be male
  allow idea that gene for low fat milk may not be passed on

1

[5]

M5.(a) (i) (volume) increases (with time)

ignore numbers

1

(ii) there is more evidence / specimens / results (for Homo sapiens)

allow examples of this, eg more / better fossils
allow converse if clearly referring to Australopithecus
ignore reference to being 'more recent'

1

(b) 2.5 – 3.15 (million years ago)

accept any number in range

1

(c) (i) Darwin

1

(ii) any **one** from:

- they believed in other theories
  allow they believed that God made all life
- insufficient evidence
  ignore 'no evidence'
- no proof
  allow not enough proof
- genes / mechanism of inheritance not known / discovered

1

[5]

M6.(a) (i) natural

1

(ii) simple

1

(iii) three billion

1

(b) any **two** from:

- reference to religion
- insufficient evidence / couldn't prove it / no proof
  ignore no evidence
- mechanism of inheritance / variation not known
  allow genes / DNA not known about
- reference to other theories
- reference to Darwin's status

2

(c) (i) tree

1

(ii) hippopotamus **and** pig
both required, either order
allow hippo

1

(iii) new evidence from fossils

1

[8]

M7.(a) genes

1

chromosomes

1

(b) (i) higher yield

1

less use of pesticides

1

(ii) any **two** from:

- uncertain about effects on health
- fewer bees
- might breed with wild plant
- seeds only from one manufacturer

2

[6]

M8.(a) sulfur dioxide

1

(b) (i) mutation

1

(ii) pale form now (more) easily seen (by predators) **or** dark form now less easily seen (by predators)

accept ref to camouflage

1

so pale form (more) likely to be eaten **or** dark form less likely to be eaten

1

so dark form (more likely to) breed / pass on genes

or

pale form less likely to breed / pass on genes

1

(c) (i) pyramid of three layers of diminishing size

either way up

1

three labels in food chain order

award 2 marks only if the pyramid is correctly labelled

accept trees / birch

accept (peppered) moth(s) / larvae

1

(ii) some material is lost in waste from the birds

1

peppered moth larvae do not eat all the leaves from the trees

1

[9]