M1. (a) snail
or
shrew

additional incorrect answer negates correct answer

1

(b) shrew

additional incorrect answer negates correct answer

1

(c) fewer shrews to eat them

1

(d) population

1

(e) **C**

1

(f) (11 000 × 0.1 =)
1 100 (kJ)

1

(g) the snails do not eat the roots of the lettuces

1

(h) any **one** from:
- light (intensity)
- temperature
- moisture (levels)
- soil pH
- mineral / ion content (of soil)

- wind intensity / speed

  ignore wind direction
- carbon dioxide (levels)
- oxygen (levels)

1

[8]

M2. (a) <u>In sequence</u>:

heron
frog
slug
lettuce

1

(b) (i) light / sun

ignore photosynthesis / respiration
cancel mark if water / ions etc given
*do **not** accept heat*

1

(ii) traps / absorbs light

accept energy for light
*do **not** accept collects / attracts*
*do **not** accept 'traps sun'*

1

(iii) 162

if correct answer, ignore working / lack of working

$\frac{10 \times 1620}{100}$ *for **1** mark*

2

[5]

M3. (a) (i) tick in box of FIRST pyramid

1

(ii) any **one** from:

- less energy / biomass lost / wasted
- greatest biomass / energy for humans
  ignore human box is bigger
  ignore .food. for humans
- shortest food chain **or** less stages **or** least number of different organisms **or** only one predator **or** only 2 boxes tall **or** least boxes
  allow only one stage

1

(b) (i) any **two** from:

- quicker / more growth **or** grow fatter
- less* urine **or** less faeces
- less* heat (lost)
- less* movement
  assume for pigs indoors
  allow converse if clear for pigs outdoors
  *(*) do **not** allow no for less*
  ignore less space

2

(ii) any **one** from:

- less cruelty **or** more ethical **or** better animal welfare
  ignore more natural
  ignore ideas referring to against God's will
- better flavour / quality (of meat)
  *ignore pig health **or** free range / organic*
- less pollution / etc / less fossil fuel used for heating

ignore quality of life

assume for pigs outdoors
allow converse if clear for pigs indoors

1

[5]

M4. (a) bottom / third pyramid ticked

extra box ticked cancels the mark

1

(b) the sun

extra ring drawn cancels the mark

1

(c) any **two** from:

- heat

  ignore keeping warm

- movement / named example internal or external

  ignore digestion

- respiration

  *do **not** allow <u>for</u> respiration*

- faeces / not all digested

  *allow waste for **1** mark if neither faeces nor excretion given*
  *(ie waste + movement = **2** marks waste + faeces = **1** mark*

- excretion/ urine

- not all of animal / all parts eaten

  *do **not** accept growth / reproduction*

2

[4]

M5. (a) (i) any **two** from:

- more milk
  (about) 50 litres milk compared to (up to) 20 litres / 30 litres more
  ignore costs / profit
- electricity produced
- farmers can keep more cows in the space
  answers must refer to number of cows <u>and</u> space

2

(ii) any **two** from:

- less stress for cow **or** not cruel to cow **or** cows have freedom to move around
  ignore references to ethical / unnatural without qualification
- crops fertilised
- less disease **or** disease not as easily spread

2

(b) more

1

less

in this order

1

[6]

M6. (a) (i) sun

ignore light

apply list principle

1

(ii) photosynthesis

apply list principle

allow approximate spelling

*do **not** accept phototropism*

1

(b) (i) chemical

1

(ii) carbon dioxide

1

(iii) carbohydrates

1

(c) As carbon dioxide from the caterpillar

if more than 2 boxes ticked deduct one mark for each additional incorrect box

1

As faeces (droppings) from the blue-tit

1

[7]

M7.(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]

M8. (a) 3 (.0)

*correct answer, irrespective of working gains **2** marks.*
*if the answer is incorrect or there is no answer, award **1** mark for use of correct figures (0.5 and 3.5) [and no other figures]*

2

(b) as faeces

*if more than two boxes ticked deduct **1** mark for each additional tick*

1

as carbon dioxide from respiration

1

(c) (i) pigs kept inside are kept in small pens

*if more than two boxes ticked deduct **1** mark for each additional tick*

1

pigs kept inside are kept warm in the winter

1

(ii) any **one** from:

- faster growth
  ignore bigger / less flavour / fatty
- need less food
  ignore references to movement / energy
- ready for market sooner
  ignore ethical arguments

1

[7]