

- 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) $(11\ 000 \times 0.1 =)$
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) In sequence:

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

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

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 for 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 and 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]