



# **GCSE Biology**

**Organisation**

**Mark Scheme**

**Time available: 55 minutes**

**Marks available: 46 marks**

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## Mark schemes

1.

- (a) x-axis: scale + labelled, including units

*scale  $\geq \frac{1}{2}$  width of graph paper label: biomass in  $g/m^2$*

1

bar widths correct

*$\pm \frac{1}{2}$ -square each side*

*allow 1 mark if 3 correct*

2

all 4 bars correctly labelled

*large fish + small fish + invertebrate (animals) + algae*

**or**

*(trophic level) 4 + 3 + 2 + 1*

**or**

*tertiary consumer + secondary consumer + primary consumer + producer*

*ignore bar heights*

1

(b) 
$$\frac{840 - 10}{840} \times 100$$

*allow equivalent calculation*

1

98.809523... / 98.810 / 98.81 / 98.8

1

99

*allow answer given to two significant figures from an incorrect calculation in step 2*

1

*an answer of 99 scores 3 marks*

- (c) inedible parts / example

*allow eaten by other animals **or** not all organisms eaten*

**or**

egested / faeces

*allow not digested*

*allow excretion / urine*

*ignore waste*

**or**

respiration / as CO<sub>2</sub>

*ignore energy losses*

*ignore movement*

1

(d) bacteria decay organic matter / sewage / algae / dead plants

(by) digestion

*allow example such as starch broken down to sugar*

**or**

*protein broken down to amino acids*

1

(and) bacteria respire aerobically

**or**

respire using oxygen

1

(which) lowers oxygen concentration (in water)

**or**

fish have less oxygen

*allow reduced respiration of fish*

1

(so) reduced energy supply causes death of fish

*allow toxins in the sewage kill fish*

*ignore pathogens or (pathogenic) bacteria cause*

*disease in fish and kills them*

1

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2.

(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]

3.

- (a) measure the length / area of the field
- (b) use (a) random number(s) (generator)  
**or**  
use coordinates method explained
- (c) compare their results with another student's results

1  
1  
1

place more quadrats

1

- (d)  $0.25 \times 5 = 1.25$

1

$$500 / 1.25 = 400$$

1

$$(40 \times 400 =) 16\ 000$$

*allow 16 000 with no working shown for 3 marks*

1

- (e) 11

1

- (f) (quadrat) 5

*both quadrat number and correct reason must be given for 1 mark*

1

very few or only 2 growing (here)

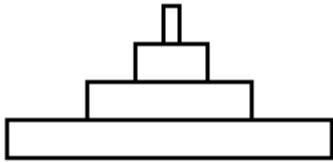
[9]

4.

- (a) any **two** from:
- *idea of* absorption of light / energy
  - transfer to chemical energy
- allow produce sugars / glucose / starch / carbohydrate / food / biomass*
- provides food / energy for animals / caterpillar
  - releases oxygen

2

(b)



1

(c) 15(%)

allow 1 mark for  $\frac{3 \times 100}{20}$  with no answer or incorrect answer

or

allow 1 mark for 0.15

2

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

- markings look like eyes / face / mouth of much larger animal
- looks fierce / scary / dangerous  
*allow it looks like a snake*
- to frighten blue tit / bird

max 1 if reference to camouflage

2

(ii) any **two** from:

- sharp / long / big claws  
*ignore strong*
- sharp / hooked beak  
*ignore strong / big*
- large wings **or** flies quickly  
*allow streamlined / aerodynamic*  
*ignore powerful wings*
- good eyesight

2

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5.

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

- not all eaten  
*allow eaten by other animals*
- used for respiration  
*ignore used / lost in heat / movement*
- lost as CO<sub>2</sub> / water / urea
- lost as faeces **or** not all digested  
*if neither mark awarded allow 1 mark for lost as waste*

*ignore references to energy losses*

*do not allow for growth / repair / reproduction*

2

- (ii) any **one** from:
- thrushes eat other things
  - thrush numbers likely to vary (considerably)  
*allow it is only an estimate (of population size) or only counted thrushes for 5 hours*
  - thrushes were not present all the time
  - thrushes feed on a much bigger area

1

- (b) (i) any **one** from:
- there are two dependent variables
  - there is no independent variable
  - to show the association / correlation / pattern (between the two variables)

1

- (ii) (snails in woodlands)  
more have dark(er) colour(ed shells) **or** fewer have light-coloured shells  
*allow converse for grassland, if clear*

1

(shells have) no / fewer stripes or have no stripes  
*allow converse for grassland, if clear*

1

- (iii) less likely to be seen (by predators / birds / thrushes)  
*allow camouflaged (from predators / birds / thrushes)*  
*allow light coloured shells with stripes would be more visible (to predators / birds / thrushes in woodland (than grassland)).*

1

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