



GCSE Biology

Plant Diseases

Mark Scheme

Time available: 50 minutes

Marks available: 43 marks

www.accesstuition.com

Mark schemes

- | | | |
|-----------|---|------------|
| 1. | (a) stinging hairs / can sting | 1 |
| | (so) this harms herbivores / stops animals eating them | 1 |
| | (so) less of the plant is removed / damaged | 1 |
| | (b) clove (oil) | 1 |
| | it has the largest areas with no bacteria growing
<i>allow largest inhibition zone or description of largest inhibition zone</i> | 1 |
| | (c) antibiotics were not tested | 1 |
| | | [6] |
| 2. | (a) A | 1 |
| | (b) D | 1 |
| | (c) use the same type of plant
or
give equal amount of water to each plant
<i>ignore size of pot</i> | 1 |
| | (d) (advantage) more minerals | 1 |
| | (disadvantage) cost / not free | 1 |
| | | [5] |
| 3. | (a) compare them to (pictures in) a gardening manual / website | 1 |
| | send to laboratory (for testing) | 1 |
| | (b) (nitrate) stunted growth | 1 |
| | (magnesium) yellowing of leaves
<i>allow chlorosis</i> | 1 |

(c) (fertiliser **S**)

has most nitrogen for good growth

*if no other marks awarded allow 1 mark for (fertiliser **s**) has more minerals than compost*

1

(and) has high(est) potassium content for stronger roots

1

(it is also) cheaper than fertiliser **T**

1

(however) has less phosphate than fertiliser **T** (although more than compost) so flowers / fruit perhaps less important for the gardener

1

[8]

4.

(a) protein

1

(b) (i) (more) magnesium gives more growth / more leaves / more duckweed
if converse must be clear that less magnesium gives less growth

1

(ii) **A** gave highest number of leaves / plants **or** more than others
it equals 'A'
*use of numbers must compare **A** with at least one other*

or

A gave most growth / most duckweed **or** more than others
allow faster / fastest / better / best growth
allow more growth with nitrate / less growth without nitrate
do not allow 'no' growth without nitrate

(c) (i) mark (c) as a whole

sensible method:

e.g. mass / weighing

ignore dry or fresh

*allow other sensible method involving measuring eg length of roots
– ignore 'size' of roots or measure roots unqualified*

1

(ii) corresponding explanation:

ignore accuracy

e.g. includes roots / includes whole plant

or

leaves vary in size

or

(length / mass / surface area given in c(i)) is a continuous variable

1

[5]

5.

(a) to kill virus

or

to prevent virus spreading

1

(b) take (stem) cells from meristem

or

tissue culture

allow take cuttings

1

(c) use Benedict's solution

1

glucoses turns solution blue to orange

1

(d) **Level 2 (3–4 marks):**

A detailed and coherent explanation is provided. The student makes logical links between clearly identified, relevant points that explain why plants with TMV have stunted growth.

Level 1 (1–2 marks):

Simple statements are made, but not precisely. The logic is unclear.

0 marks:

No relevant content.

Indicative content

- less photosynthesis because of lack of chlorophyll
- therefore less glucose made
- so
- less energy released for growth
- because glucose is needed for respiration
- and / or
- therefore less amino acids / proteins / cellulose for growth
- because glucose is needed for making amino acids / proteins / cellulose

4

[8]

6.

(a) phloem

1

(b) translocation

1

(c) either:

less (sugars for) respiration

(so) less energy released

or

less amino acids made (1)

(so) less protein produced **or** less protein synthesis (1)

or

less cellulose made (1)

(so) weaker cell walls (1)

(d) (aphids) can fly to another plant **or** part of the plant

ignore to fly unqualified

1

to get (more) food

allow to find a mate

allow idea of less competition for food

allow to escape predators

*do **not** accept escape prey*

1

(e) (oil) prevents aphids from attaching to leaf **or** causes aphids to slide off leaf

ignore 'the leaf is slippery'

or

idea that oil may harm / kill the aphid

allow oil may be unpleasant to the aphid

1

(f) (plant / stem has) thorns

allow spines / spikes / prickles

ignore stings

*do **not** accept thorns protect (the plant) from predators*

1

(g) C

if any other letter given then no marks for the question

1

(fungi / spores) blown by / in direction of the wind

*allow black spot / disease is blown by / in direction of
the wind*

or

it's the closest plant (to A)

*do **not** accept reference to bacteria / viruses / pollen
being blown*

1

(h) any **one** from:

- spread rose bushes out more

*allow isolate the infected plant
allow idea of barrier around infected plant
ignore separate unless qualified*

- remove any infected parts of the plant

allow remove infected plant / A

- use a fungicide

*ignore pesticide
do **not** accept insecticides / herbicide*

1

[11]