

Plant Diseases

These practice questions can be used by students and teachers and is suitable for GCSE AQA Biology topic Questions 8641

Level: GCSE AQA Biology 8641

Subject: Biology

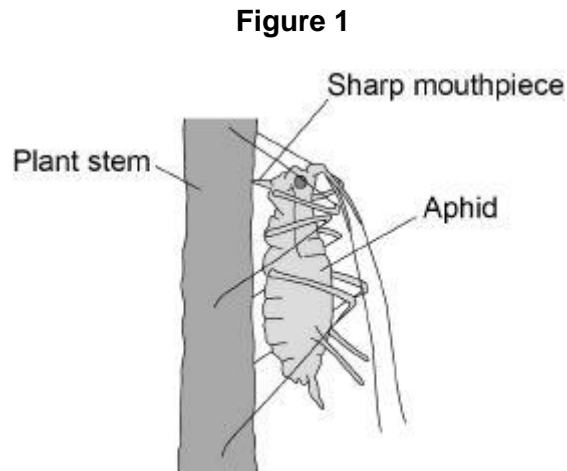
Exam board: GCSE AQA

Topic: Plant Diseases

Q1.

Aphids are small insects that carry pathogens.

Figure 1 shows an aphid feeding from a plant stem.



- (a) An aphid feeds by inserting its sharp mouthpiece into the stem of a plant.

After feeding, the mouthpiece of an aphid contains a high concentration of dissolved sugars.

Which part of the plant was the aphid feeding from?

Tick **one** box.

- | | |
|----------------|--------------------------|
| Palisade layer | <input type="checkbox"/> |
| Phloem | <input type="checkbox"/> |
| Stomata | <input type="checkbox"/> |
| Xylem | <input type="checkbox"/> |

(1)

- (b) What is the process that transports dissolved sugars around a plant?

Tick **one** box.

- Filtration
- Respiration
- Translocation
- Transpiration

(1)

- (c) Plants infected with aphids have stunted growth.

Explain **one** way the removal of dissolved sugars from the stem of the plant causes stunted growth.

(2)

- (d) Most aphids do not have wings when they hatch. After several generations, some aphids hatch which have wings and can fly.

Explain the advantage to the aphid of being able to fly.

(2)

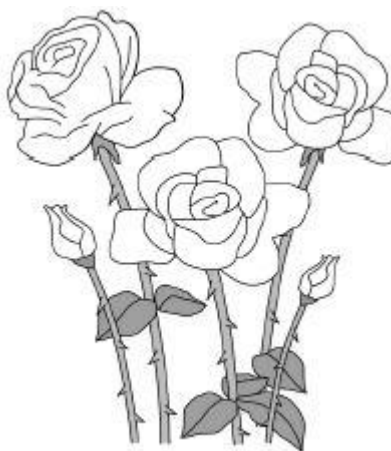
- (e) The leaves of some plants release oils onto their surface.

Suggest how the production of oil on the surface of a leaf may protect the plant from aphids.

(1)

Figure 2 shows part of a rose plant.

Figure 2

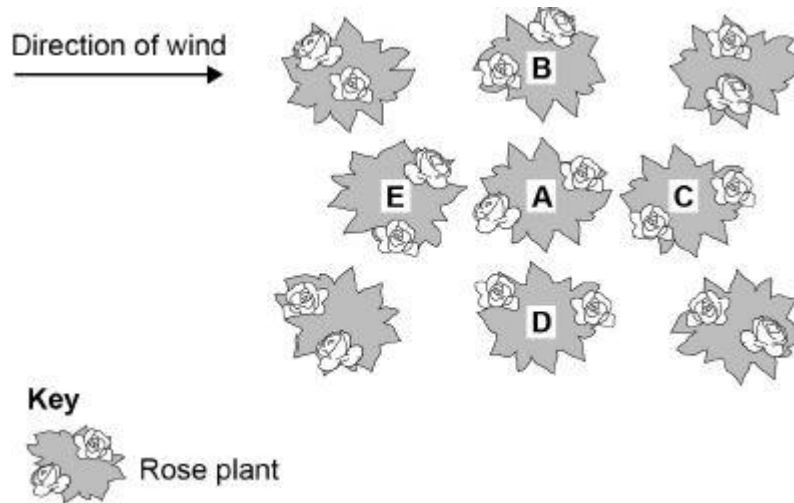


- (f) Give **one** adaptation shown in **Figure 2** that helps the rose plant defend itself.

(1)

Figure 3 shows a plan of a garden containing rose plants.

Figure 3



(g) Plant **A** has the fungal disease rose black spot.

Which plant in **Figure 3** is the fungus likely to spread to first?

Give a reason for your answer.

Plant _____

Reason

(2)

(h) Suggest **one** way the gardener could reduce the spread of rose black spot to the other plants in the garden.

(1)

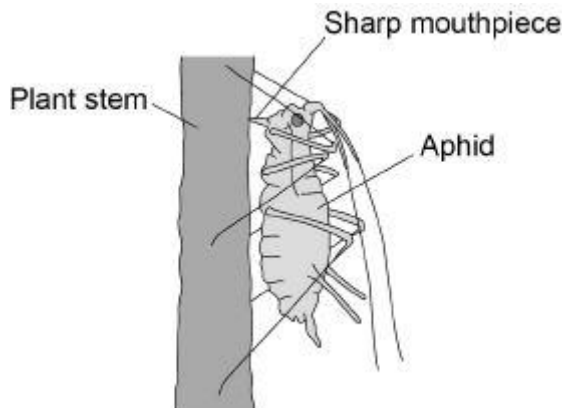
(Total 11 marks)

Q2.

Plants can be infected by fungi, viruses and insects.

Aphids are small insects that carry pathogens.

The diagram below shows an aphid feeding from a plant stem.



- (a) An aphid feeds by inserting its sharp mouthpiece into the stem of a plant.

Give the reason why the mouthpiece of an aphid contains a high concentration of dissolved sugars after feeding.

(1)

- (b) Plants infected with aphids may show symptoms of magnesium deficiency.

Magnesium deficiency symptoms include:

- yellow leaves
- stunted growth.

Explain how a deficiency of magnesium could cause these symptoms.



(5)

(c) A farmer thinks a potato crop is infected with potato virus Y (PVY).

The farmer obtains a monoclonal antibody test kit for PVY.

To make the monoclonal antibodies a scientist first isolates the PVY protein from the virus.

Describe how the scientist would use the protein to produce the PVY monoclonal antibody.

(4)
(Total 10 marks)

Q3.

Rose black spot is a disease of roses.

(a) What type of microorganism causes rose black spot?

Tick **one** box.

- A bacterium
- A fungus
- A protist
- A virus

(1)

(b) Explain how different **types of organism** defend themselves against microorganisms.

(6)

(c) A student tried to grow some bacteria in the laboratory.

The diagram shows some of the apparatus used.



This is the method used.

1. Remove the lid of the Petri dish.
2. Remove the lid of the bottle containing the bacteria.
3. Use the inoculating loop to remove some of the bacteria from the bottle.
4. Spread the bacteria over the agar using the inoculating loop.
5. Put the lid back on the Petri dish.
6. Put the Petri dish into an incubator at 25 °C for 24 hours.

Steps 1–5 could cause the sample of the bacteria on the petri dish to be contaminated.

Give **three** improvements to the method to prevent contamination.

1.

2.

3.

(3)

(d) Why did the student grow the bacteria at 25 °C rather than at 40 °C?

Tick **one** box.

So the bacteria grew more quickly

So the bacteria grew more slowly

To prevent the growth of a harmful pathogen

To save money

(1)

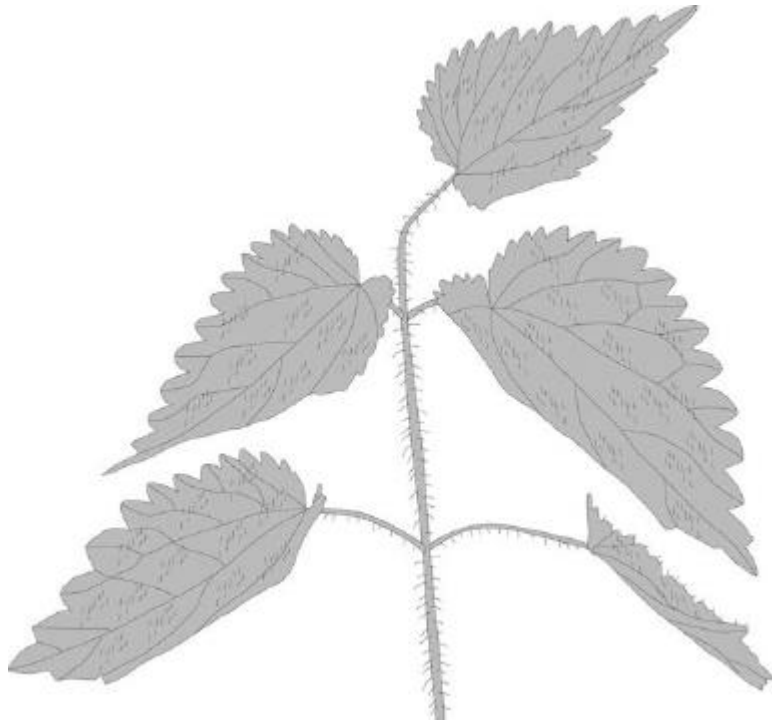
(Total 11 marks)

Q4.

Plants have adaptations to help defend themselves and to help them survive.

Figure 1 shows a nettle plant.

Figure 1



(a) Explain how the nettle is adapted for defence and protection.

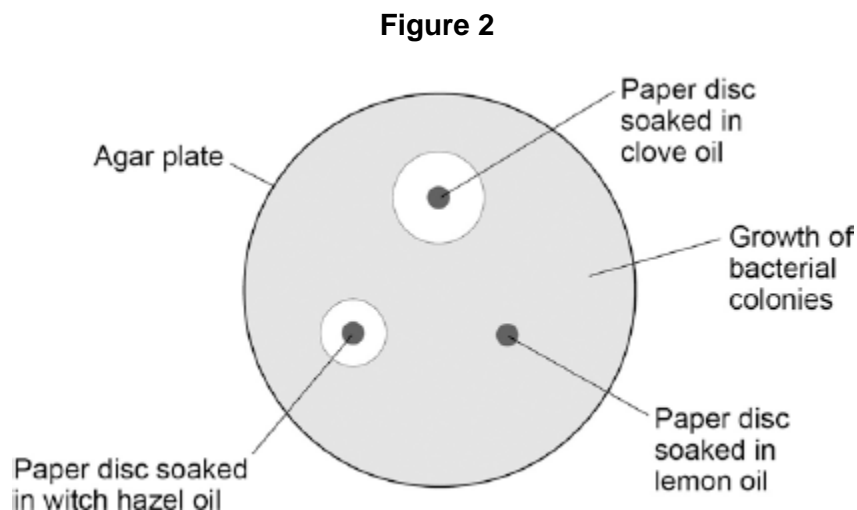
(3)

(b) Witch hazel is another plant adapted for defence.

Witch hazel produces oil with antiseptic properties. The oil prevents bacteria from attacking the plant.

A student investigated how effective three different plant oils were at preventing the growth of bacteria.

Figure 2 shows the results.



Which plant oil is the most effective at preventing the growth of bacteria?

Give a reason for your answer.

Oil _____

Reason

(2)

(c) The student tested tea tree oil using the same method.

The results showed tea tree oil was the most effective at preventing bacterial growth.

The student concluded that tea tree oil could be used to treat bacterial infections instead of antibiotics.

Give **one** reason why this is **not** a valid conclusion.

(1)
(Total 6 marks)

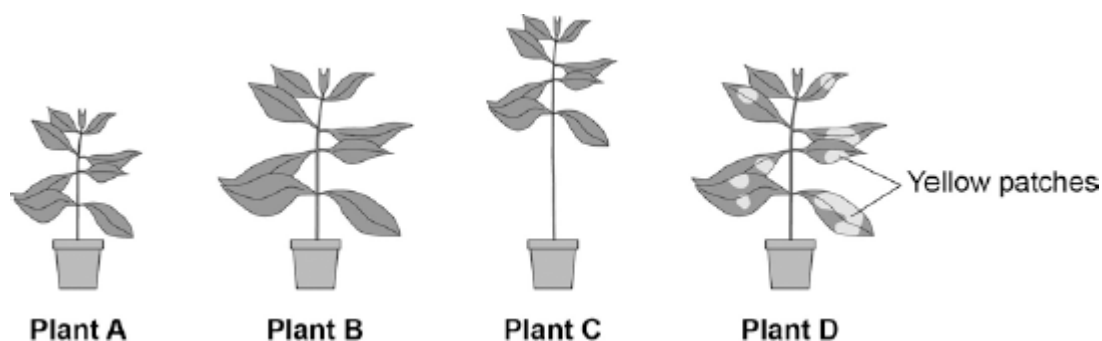
Q5.

To be healthy, plants need the right amount of mineral ions from the soil.

The diagram below shows four plants.

The plants were grown in four different growing conditions:

- sunny area, with nitrate and magnesium added to the soil
- sunny area, with magnesium but **no** nitrate added to the soil
- sunny area, with nitrate but **no** magnesium added to the soil
- dark area, with nitrate and magnesium added to the soil.



(a) Which plant was grown with no **nitrate**?

Tick **one** box.

A B C D

(1)

(b) Which plant was grown with no **magnesium**?

Tick **one** box.

A B C D

(1)

(c) Give **one** variable that was kept constant in this experiment.

(1)

- (d) Plants need other minerals for healthy growth such as potassium ions and phosphate ions.

A farmer wanted to compare the percentage of minerals in two types of manure.

- Cow manure from her own farm.
- Chicken manure pellets she could buy.

The table below shows data for each type of manure.

	Phosphate ions in %	Potassium ions in %
Cow manure	0.4	0.5
Chicken manure pellets	2.5	2.3

Suggest **one** advantage and **one** disadvantage of using the chicken manure pellets compared to the cow manure.

Advantage

Disadvantage

(2)
(Total 5 marks)

Q6.

Tobacco mosaic virus (TMV) is a disease affecting plants.

The diagram below shows a leaf infected with TMV.



Yellow patches where
TMV has destroyed
chloroplasts

© Nigel Cattlin/Visuals Unlimited/Getty Images

- (a) All tools should be washed in disinfectant after using them on plants infected with TMV.

Suggest why.

(1)

- (b) Scientists produced a single plant that contained a TMV-resistant gene.

Suggest how scientists can use this plant to produce **many** plants with the TMV-resistant gene.

(1)

- (c) Some plants produce fruits which contain glucose.

Describe how you would test for the presence of glucose in fruit.



Blank lined writing area for the first question.

(2)

(d) TMV can cause plants to produce less chlorophyll.

This causes leaf discoloration.

Explain why plants with TMV have stunted growth.

Blank lined writing area for the second question.

(4)

(Total 8 marks)

Q7.

A gardener is looking at the plants in his greenhouse.

- (a) Some of the plants have a disease.

Give **two** ways the gardener could identify the pathogen infecting the plants.

1.

2.

(2)

- (b) Plants can become unhealthy if they do not have essential mineral ions.

Describe the appearance of plants with:

- **nitrate** deficiency
- **magnesium** deficiency.

Nitrate deficiency

Magnesium deficiency

(2)

- (c) Plants need other mineral ions.

- Potassium ions are needed for healthy root growth.
- Phosphate ions are needed for healthy flowers and fruits.



The gardener makes his own garden compost.

The percentage (%) of minerals in his compost was compared with two fertilisers he could buy.

The data are shown in the table below.

	Percentage (%) mineral content			Cost in £ / kg
	Nitrate ions	Phosphate ions	Potassium ions	
Garden compost	0.5	0.3	0.8	0.00
Fertiliser S	5.0	1.3	6.6	4.99
Fertiliser T	3.0	12.0	6.0	9.99

The gardener buys Fertiliser **S**.

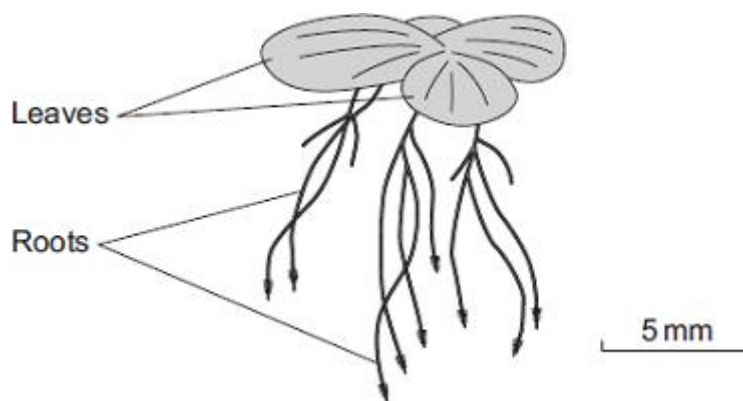
Explain why he chose Fertiliser **S**.

(4)
(Total 8 marks)

Q8.

Duckweed is a plant. Duckweed grows in ponds. The leaves of duckweed float on the surface of the water and its roots hang down in the water.

The drawing shows a duckweed plant.



- (a) Duckweed roots absorb nitrate ions from the water. The nitrate ions help the duckweed to grow.

Draw a ring around the correct answer to complete the sentence.

Duckweed needs nitrate ions to make

- | |
|---------------|
| carbohydrate. |
| fat. |
| protein. |

(1)

- (b) Some students grew duckweed plants in three different solutions of mineral ions, **A**, **B** and **C**, and in distilled water (**D**).

Table 1 shows the concentrations of mineral ions in each of **A**, **B**, **C** and **D** at the start of the investigation.

Table 1

Mineral ion	Concentration of mineral ions in mg per dm ³ at the start of the investigation			
	A	B	C	D

Nitrate	1000	4	4	0
Phosphate	300	0	0	0
Magnesium	200	84	24	0

The students counted the number of duckweed leaves in **A**, **B**, **C** and **D** at the start of the investigation and after 28 days.

Table 2 shows their results.

Table 2

	A	B	C	D
Number of leaves at start	4	4	4	4
Number of leaves after 28 days	50	27	14	6

- (i) Using **Table 1** and **Table 2**, describe the effect of magnesium ions on the growth of duckweed.

(1)

- (ii) Solution **A** contained the highest concentration of nitrate ions.

One student said, 'The results show that nitrate ions are needed for the growth of duckweed.'

What evidence in **Table 2** supports what the student said?

(1)

- (c) The students measured the growth of the duckweed by counting the number of leaves.

- (i) Suggest a better method of measuring the growth of the duckweed.

(1)

(ii) Suggest why your method is better than the students' method.

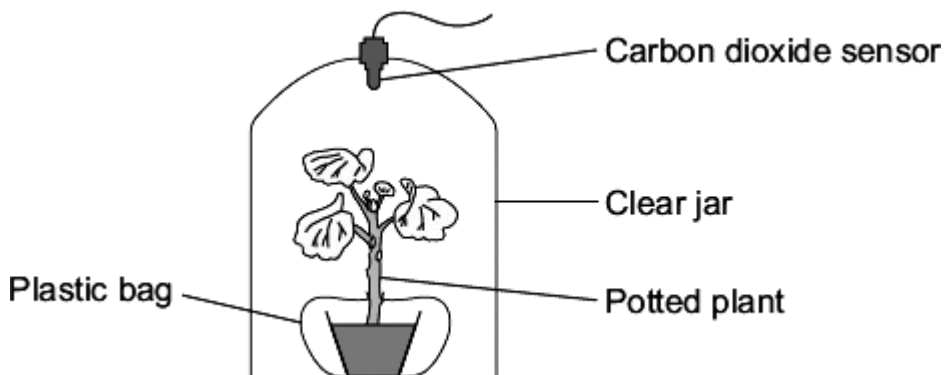
(1)

(Total 5 marks)

Q9.

A student measured the concentration of carbon dioxide in the air around a potted plant on two different days.

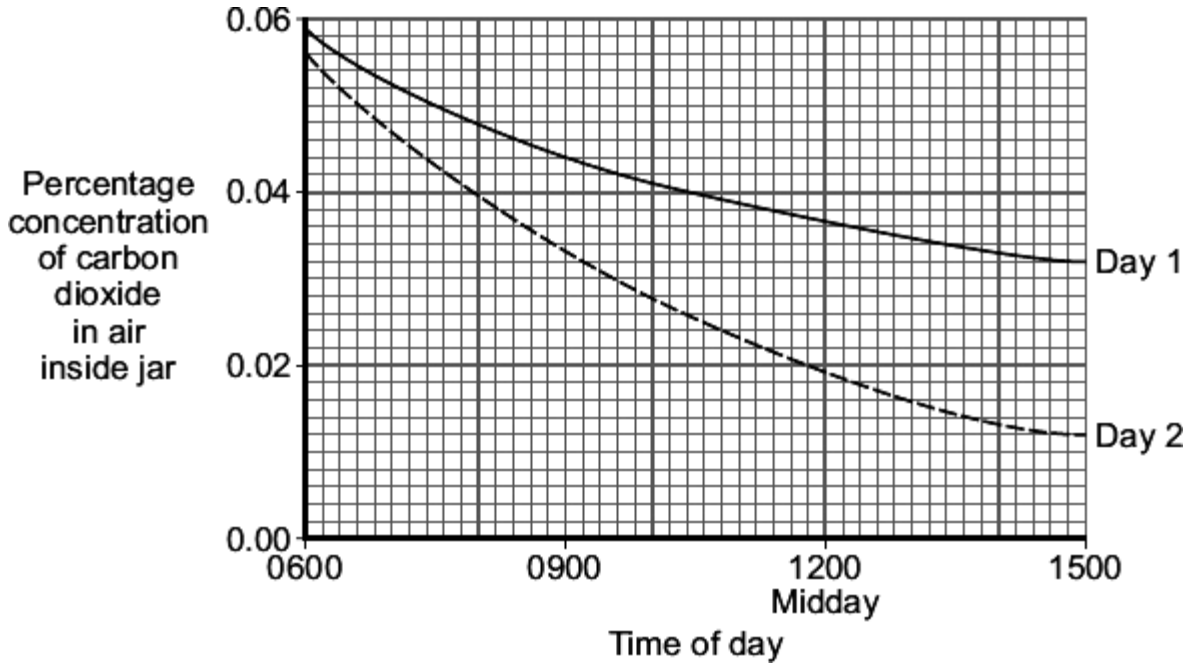
The diagram shows the student's apparatus.



There was a plastic bag round the plant pot to stop microorganisms in the soil affecting the concentration of gases in the air inside the jar.

The apparatus was put near a window.

The graph shows the results.



(a) **Day 1** was cloudier than **Day 2**.

What evidence from the graph shows that **Day 1** was cloudier?

Explain your answer.

(2)

(b) A potted plant sometimes develops yellow leaves.

The development of yellow leaves could be due to the lack of a mineral ion.

Suggest the mineral ion that could be lacking.

(1)

(Total 3 marks)

Q10.

People often grow pondweed in fishponds to *oxygenate* the water.

- (a) Name the process that the pondweed uses to produce oxygen.

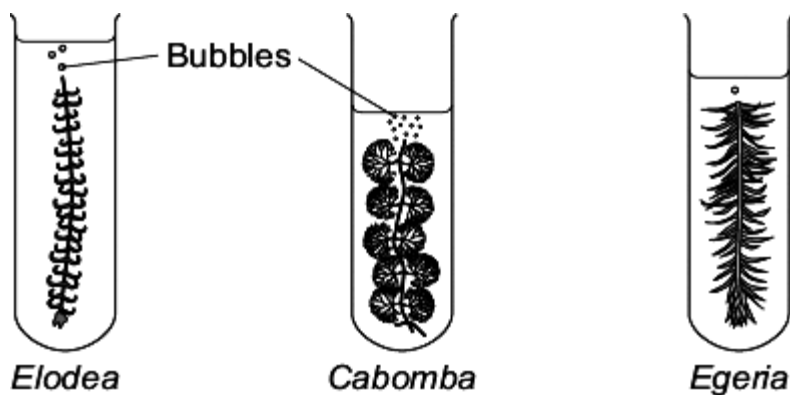
(1)

- (b) A student investigated oxygen production in three different pondweeds, *Elodea*, *Cabomba* and *Egeria*.

The student:

- cut a piece of pondweed from an *Elodea* plant
- put the pondweed into a tube of water
- counted the bubbles given off in one minute
- did the experiment again using a piece of pondweed from a *Cabomba* plant
- did the experiment a third time using a piece of pondweed from an *Egeria* plant.

The diagram shows the student's investigation.



The table shows the results.

Pondweed	Number of bubbles produced in 1 minute
<i>Elodea</i>	17
<i>Cabomba</i>	28

<i>Egeria</i>	8
---------------	---

(i) The student said:

“I suggest that people grow *Cabomba* in garden ponds to oxygenate the water fastest.”

Give **three** variables the student should have controlled to make sure his conclusion was valid.

Use information from the student’s method and the diagram.

1.

2.

3.

(3)

(ii) The three pondweeds all cost about the same.

Suggest **one** other factor that people with fishponds might think about before deciding which type of pondweed to use.

(1)

(c) A person grows *Cabomba* in his pond.

The *Cabomba* plants develop yellow leaves.

Which mineral ion would stop the leaves turning yellow?

(1)
(Total 6 marks)

Q11.

Plants need mineral ions for healthy growth.

(a) Which part of a plant takes in mineral ions?

Tick (✓) **one** box.

Flower

Leaf

Root

(1)

(b) Leaves are usually green.

(i) What is the green substance in leaves?

Draw a ring around your answer.

chlorophyll

glucose

starch

(1)

(ii) The green substance in leaves is important to plants.

Explain why.

(2)

(c) A shortage of mineral ions can affect a plant.

Draw **one** line from each mineral ion to the effect of its shortage.

Mineral ion	Effect of its shortage
<div style="border: 1px solid black; padding: 10px; width: 100%;">Magnesium</div>	<div style="border: 1px solid black; padding: 10px; width: 100%;">Yellow leaves</div>
<div style="border: 1px solid black; padding: 10px; width: 100%;">Nitrate</div>	<div style="border: 1px solid black; padding: 10px; width: 100%;">Stunted growth</div>
	<div style="border: 1px solid black; padding: 10px; width: 100%;">White flowers</div>

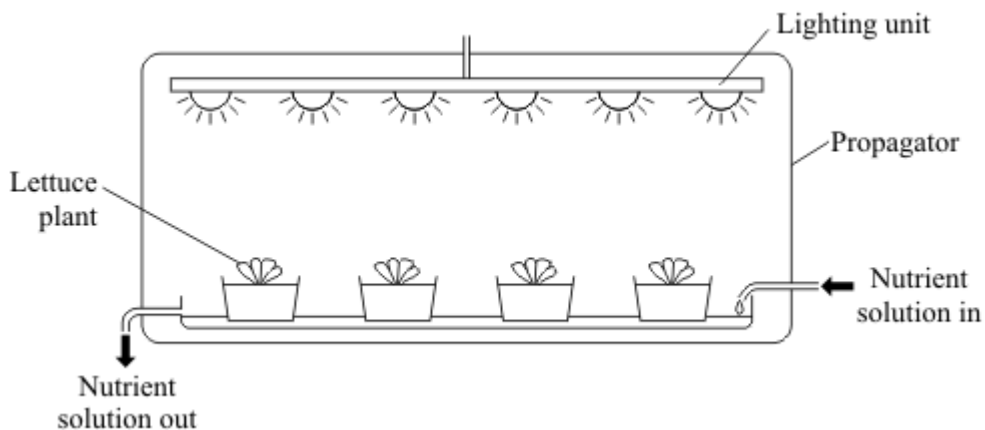
(2)

(Total 6 marks)

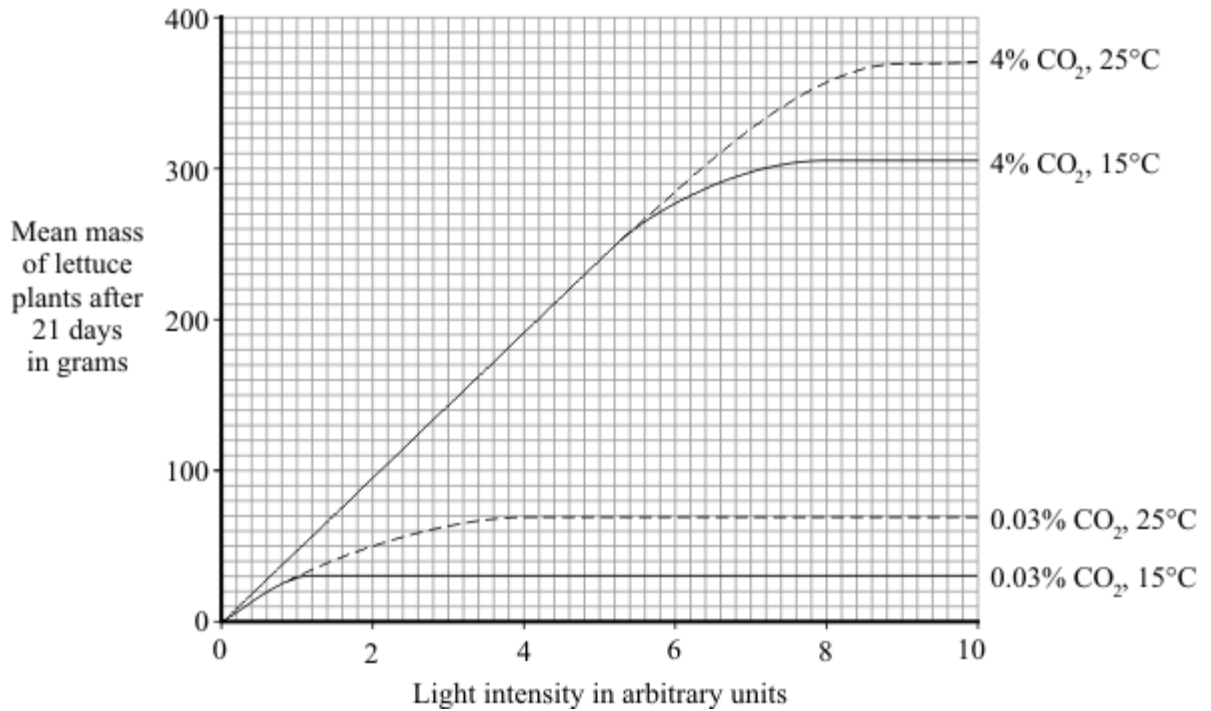
Q12.

Changing the conditions in which plants grow affects how fast they grow.

The diagram shows a propagator in which scientists can control temperature, light intensity and carbon dioxide concentration.



The graph shows the effects of changing the temperature, light intensity and carbon dioxide concentration on the growth of lettuce plants.



(a) Describe and explain the effect of increasing light intensity on the mean mass of lettuce plants at 4% carbon dioxide and 15 °C.

(3)

(b) Growers wish to make maximum profits from their lettuces.

What do they need to consider before making decisions about the growing

conditions for their lettuces?

(2)

- (c) The nutrient solution contains nitrate ions and magnesium ions.

Complete the table to show the functions of these ions in plants and their deficiency symptoms.

Ion	Function in plants	Deficiency symptoms
Nitrate	<hr/>	<hr/>
	<hr/>	<hr/>
	<hr/>	<hr/>
Magnesium	<hr/>	<hr/>
	<hr/>	<hr/>
	<hr/>	<hr/>

(4)

(Total 9 marks)

Q13.

Nitrate fertilisers are important in agriculture. They help to increase crop yields and so make food cheaper to buy. Some of the nitrate fertilisers run off into rivers and get into drinking water. The problem is that the nitrates can react with iron in our blood. This reduces the blood's ability to carry oxygen. If the amount of nitrate in drinking water is too high, it can cause 'blue baby syndrome', in which babies look blue due to lack of oxygen.

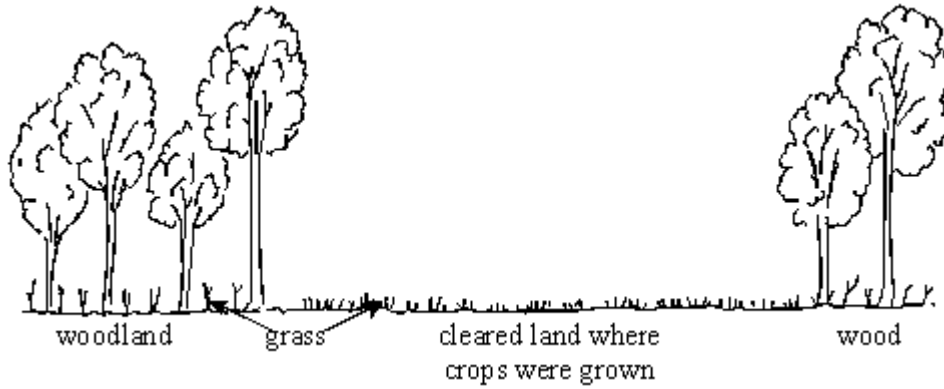
The table shows the amount of nitrate fertilisers used and the crop yield.

Nitrate fertilisers in kilograms per hectare of land	0	150	250
Crop yield in tonnes per hectare of land	5	8	7

Use the information above to suggest what should be done, by farmers and government, to prevent 'blue baby syndrome'. Explain the reasons for your suggestions.

(Total 3 marks)

Q14.
In some developing countries woodland is cut down and burned. The ash acts as fertiliser. Crops are grown for three years. The land is then left as it is too poor to grow any more crops.



- (a) In the original woodland trees and plants died and grew for hundreds of years. When cleared the land grew crops for only three years. Explain this difference in as much detail as you can.

(3)

- (b) What could farmers do to make crops grow on the cleared land for more than three years?

(2)

(Total 5 marks)

Mark schemes

Q1.

- (a) phloem 1
- (b) translocation 1
- (c) either:
- less (sugars for) respiration 1
- (so) less energy released 1
- 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 1
ignore to fly unqualified
- 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 1
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*

- (g) C 1
- 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]

Q2.

- (a) (mouthpiece) has pierced / entered the phloem
or
(the aphid) has been feeding from the phloem 1
- (b) yellow leaves due to lack of chlorophyll
*ignore 'chloroplasts'
ignore magnesium is needed to make chlorophyll* 1
- (therefore) less / no light absorbed (by chlorophyll) 1
- (therefore) lower rate of / no photosynthesis
*do **not** allow 'energy is produced by photosynthesis'* 1
- (therefore) plant makes less / no sugar / glucose 1

(therefore) plant converts less / no sugar / glucose into protein (for growth, so growth is stunted)

allow less glucose / sugar converted into cellulose (cell wall)
allow less energy for protein synthesis

1

(c) inject the protein / it into a mouse

1

combine lymphocytes with tumour / cancer cells to make hybridoma (cells)

ignore white blood cells
allow T or B lymphocytes
ignore tumour unqualified

1

find a hybridoma which makes a monoclonal antibody specific to PVY

1

(the scientist) clones (the hybridoma) to produce many cells (to make the antibody)

*do **not** allow cloning of original stem cells*
allow many rounds of cloning / mitosis

1

[10]

Q3.

(a) a fungus

1

(b) **Level 3 (5-6 marks):**

Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.

Level 2 (3-4 marks):

Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.

Level 1 (1-2 marks):

Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.

Level 0

No relevant content

Indicative content

	defence	description of defence
animals	skin	sebum / oils to kill microbes dead layer difficult to penetrate
	nose	hairs keep out dust and

	trachea / bronchi	microbes mucus traps microbes cilia moves mucus
	stomach	(hydrochloric) acid kills bacteria
	white blood cells	produces antibodies produces antitoxins engulf microbes / phagocytosis
plants	cell wall	tough / difficult to penetrate
	waxy cuticle	tough / difficult to penetrate
	dead cells / bark	fall off, taking pathogens with them
	production of antibacterial chemicals	kill bacteria
fungi	antibiotic production	kill bacteria

6

(c) any **three** from:

- sterilise agar (before use)
- sterilise (Petri) dish before use
- disinfect bench (before use)
- pass inoculating loop (through flame)
- secure lid with (adhesive) tape
- minimise exposure of agar / culture to air / lift and replace lid as quickly as possible

allow:

- *dip loop into ethanol (after flaming)*
- *keep the lid on the plate for as long as possible*
- or**
- *minimise exposure of agar to air*
- or**
- *only tilt the lid off (rather than remove it)*
- *flame the neck of the bottle*

3

(d) to prevent the growth of a harmful pathogen

1

[11]

Q4.

(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
allow largest inhibition zone or description of largest inhibition zone 1
- (c) antibiotics were not tested 1
- [6]**

Q5.

- (a) **A** 1
- (b) **D** 1
- (c) use the same type of plant
or
 give equal amount of water to each plant
ignore size of pot 1
- (d) (advantage) more minerals 1
- (disadvantage) cost / not free 1
- [5]**

Q6.

- (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]

Q7.

- (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

allow chlorosis

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]

Q8.

- (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]

Q9.

- (a) less carbon dioxide used
or higher carbon dioxide (concentration) in jar
do not allow no carbon dioxide used or no change in carbon dioxide 1
- because less photosynthesis **or** light was a limiting factor
do not allow no photosynthesis 1

(b) magnesium / Mg

*do **not** allow manganese / Mn*

allow iron / Fe

ignore nitrates

1

[3]

Q10.

(a) photosynthesis

*do **not** accept other additional processes*

1

(b) (i) any **three** from, eg:

ignore time / apparatus

- mass of pondweed

type of pondweed = max 2

accept amount / volume / length / size

ignore number / surface area of leaves / pondweed unqualified

- volume of water

accept amount

- other reasonable features of the water

- light intensity

accept distance between light source and tube / pondweed

- light colour

accept light if neither colour nor intensity is given

- carbon dioxide

- temperature

- pH

3

(ii) any **one** idea from, eg:

ignore reference to cost

- how much oxygen they give off

- is pondweed poisonous to fish

- will fish eat pondweed

- is pondweed harmful to environment

- how long the pondweed lives

- growth rate / size of pondweed
- reference to appearance / aesthetics
- availability

1

(c) magnesium / Mg

accept iron / Fe
ignore ion and + or -
ignore nitrate

1

[6]

Q11.

(a) root

1

(b) (i) chlorophyll

1

(ii) absorbs / traps / takes in light

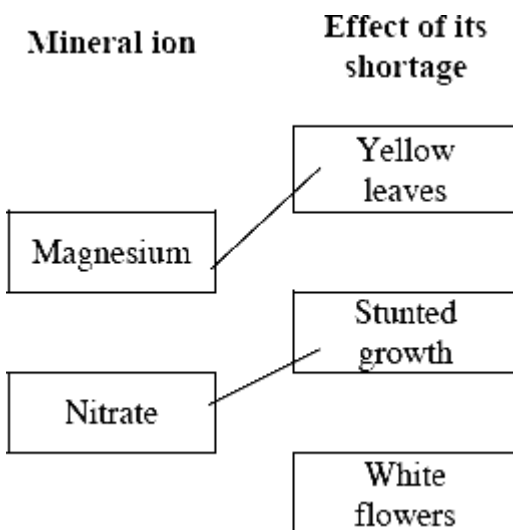
*do **not** accept attracts / solar energy / sunshine / sun*

1

(for) photosynthesis

accept to make food / glucose / sugar/ biomass

1



(c)

1 mark per correct line
extra line from a mineral ion cancels the mark

2

[6]

Q12.

(a) any **three** from:

- ((mean) mass) increases up to 7 / 8 units (of light) then levels off
- light limiting factor up to 7 / 8 units
- for photosynthesis
must be in correct context
- other factor / temperature limiting above 7 / 8 units

3

(b) any **two** from:

- cost of providing conditions / heat / light / CO₂
- effect of treatment on profit
allow too much of factor is wasteful
- relevant use of data from graph eg limiting factors
- named other factors eg fertiliser / pest control / weeds / density of planting
allow taste / appearance

2

(c) **nitrate function**

produce amino acids / proteins / enzymes
ignore DNA
*do **not** allow chlorophyll*

1

nitrate deficiency

stunted growth
allow description
ignore plant dies

1

magnesium function

produce chlorophyll
ignore chloroplasts

1

magnesium deficiency

yellow leaves / plant
ignore plant dies

1

[9]

Q13.

use less nitrate / fertiliser

accept use none
use a different fertiliser is neutral
prevent nitrate fertiliser run off is neutral

1

any **two** from:

explanation that with less or none the crops still grow

make more land available to grow more crops

monitoring of water

legislation

organic farming / manure

genetically modified crops

give babies bottled water

2

[3]

Q14.

(a) *idea:*
wood goodness recycled/crops goodness removed
gains 1 mark

1

but
wood minerals/nutrients recycled/crops remove nutrients/minerals
gains 2 marks

wood and crops compared
for 1 mark

2

(b) (add) fertiliser/nutrients/minerals
(add) manure/animal waste/compost
any two for 1 mark each

(accept move to new area for 1 mark)
rotation

max marks 2

2

[5]