Practice Question Set For GCSE
Subject : Biology
Paper-1 Topic: B1 Cell Biology

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Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) any **two** from:
- light (intensity)
- water
- temperature
- mass / volume of soil

allow size of box

allow depth of soil

- soil type **or** (soil) pH
- other mineral content of the soil

ignore fertiliser

- number of plants (in a box)

allow planting density

- starting mass / height / age of corn
- type / variety of corn

allow species of corn

- harvested at the same time

allow harvested when mature

*do **not** accept nitrate ion concentration*

2

(b) suitable scale **and** axis labelled (mean <u>mass</u> (of corn) per plant in <u>grams / g</u>)

1

all points plotted correctly

allow a tolerance of ± ½ a small square

*allow **1** mark for 4 or 5 correct plots*

2

suitable line of best fit

ignore line extended beyond 50ppm

ignore line joined point to point with straight lines

*max **3** marks for bar chart*

1

(c) as (soil) nitrate / concentration increases, (mean) mass (of corn) increases **and** then decreases

1

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with a maximum (mean mass of corn) at 30 (ppm)

*allow a maximum consistent with graph in part **(b)***

1

*if no other mark awarded, allow **1** mark for (mean mass of corn) increases to 30 (ppm) **or** (mean mass of corn) decreases above 30 (ppm)*

(d) any **four** from:

(economic)

- increasing nitrate / ion (concentration) up to 30 ppm will give high(er) yield / income / sales

  ignore mass for this marking point only

- greater than 30 ppm will decrease yield / mass / income / sales **and** therefore waste money / fertiliser

  *allow greater than 30 ppm, the yield / mass / income / sales / will not increase (as much) **and** therefore waste money / fertiliser*

- any increase in yield / mass / income / sales must be balanced with cost (of fertiliser)

  *allow profit / benefit will depend on yield / mass / income / sales **and** cost (of fertiliser)*

- quantity to add will depend on original nitrate (ion concentration) of soil

(environmental)

- (when it rains) fertiliser / nitrate will enter rivers / lakes / sea / ocean causing pollution

  allow fertiliser / nitrate run-off causes pollution

  allow eutrophication or description of eutrophication

  allow description of effect of fertiliser / nitrate pollution eg health impact of fertiliser in drinking water

  allow environmental implication of (significant) energy use in fertiliser production / transport

4

*max **3** marks if no reference to environmental implication*

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Q2.

(a) $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

1

(b) (as temperature increases) the rate of photosynthesis increases **then** (the rate of photosynthesis) decreases

ignore references to volume unqualified

1

fastest rate between 30 °C **and** 35 °C

allow a fastest rate at a temperature above 30 °C and below 35 °C
allow reaches an optimum temperature between 30 °C and 35 °C

1

up to 30 °C the rate doubles every 5 °C increase

allow up to 30 °C the rate increases at an increasing rate
allow up to 30 °C the rate increases exponentially

1

(c) enzymes (in the plant / chloroplast) become destroyed

allow enzymes become denatured
*do **not** accept enzymes are killed*
*do **not** accept cells / plants are denatured*

1

(because) active site changes shape

OR

the active site changes shape (1)

(so) the substrate no longer fits / binds (1)

OR

enzymes (in the plant / chloroplast) become destroyed (1)

allow enzymes become denatured
*do **not** accept enzymes are killed*
*do **not** accept cells / plants are denatured*

(so) the substrate no longer fits / binds (1)

ignore the plant is killed / dead

1

(d) repeat the investigation, measuring the volume of gas to 0.5 cm^3

1

(e) any **two** from:

- may have too many tomatoes to eat / sell

  *allow the idea of a glut **or** all ripen at the same time*
- other factors could limit photosynthesis

  allow other named limiting factor could limit photosynthesis
  allow factors could limit tomato production
- the optimum temperature might be above / below 25 °C
- greenhouses are poorly insulated
- pollution from the heater

  allow increase carbon dioxide emissions
  allow increase global warming
- increase the rate of transpiration

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allow increase the water loss from the plant

- increased spread of plant disease(s)

  *if no other mark awarded allow it is a fire hazard for **1** mark*

2

(f) meristem

1

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