

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

(a)

Factor	Biotic	Abiotic
Diseases	✓	
Herbivores	✓	
Temp		✓
Water		✓

allow 1 mark for 2 or 3 correct

2

(b) (leaves block light near tree so) more light (as you move outwards)

allow low light intensity under tree

ignore Sun

1

for photosynthesis

allow less photosynthesis under the tree

1

(which) produces (more) glucose / proteins (for growth)

ignore growth

ignore food

allow molecules, cell components or other correct

substances instead of proteins

if no other mark awarded allow less water / ions / minerals /

nutrients under the tree

1

(c) quadrat

correct spelling only

1

light meter

allow lux meter

allow light intensity meter

allow light data logger

1

in this order

- (d) 1.5(0) (m²)
allow 15 000 cm²
1
- (e) to keep light (intensity) as similar as possible
allow the light (intensity) might change
ignore references to temperature
ignore weather
ignore Sun
1
- (f) any **one** from:
- repeat (investigation) around the tree
allow repeat in different directions
 - repeat (investigation) for other trees / areas
 - sample every one metre
 - count the number of each species present (rather than percentage cover)
ignore repeats unqualified
ignore repeat at different times / days / seasons
ignore different size quadrat
ignore random sampling
- 1
- (g) daisy
1
- (h) as light (intensity) increased so did the percentage / cover of plants
ignore directly proportional
ignore positive correlation unqualified
1
- up to 100% / maximum at 175 (arbitrary units)
ignore distance
1
- (i) any pair from:
- (lack of) water / rain (1)

because the leaves are stopping the rain
or
because the roots of the tree are absorbing it (1)
allow soil moisture
 - (lack of) minerals / ions (1)
allow magnesium / nitrate / nutrients

because the tree (roots) have absorbed them (1)
 - temperature (1)
allow too cold / cooler

because less thermal energy from the sun is reaching under the tree canopy (1)
allow 'heat' for thermal energy
allow pH / acidity (1)
because (some) fallen leaves are acidic (1)
- 2

ignore carbon dioxide
*do **not** accept oxygen*

[15]

Q2.

- (a) carbon dioxide + water $\rightarrow$ (glucose) + oxygen
allow reactants in either order
allow correct formulae, balancing not required 1
- (b) chlorophyll 1
- (c) glucose (produced in photosynthesis) is converted into starch 1
- (d) starch could be broken down (into sugar) 1
- (e) so the colour of the iodine solution / result can be seen 1
- (f) any **one** from:
- turn off Bunsen / flame before collecting ethanol
 - use a water bath to heat the ethanol
allow idea that there are no naked flames near the ethanol 1
- (g) **A** orange / brown 1
- B** black / blue-black 1

[8]