

Organisms and their Environment

Mark Scheme 7

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Organisms and their Environment
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 7

Time Allowed: 35 minutes

Score: /29

Percentage: /100

- 1 (a) *bars must be within potato square*
- bars plotted accurately at 2.6 and 5.6 ;
shading correct according to key ; [2]
- (b) ((sugar) beet ; [1]
(ii) wheat ; [1]
- (c) *award three different main points as given below
or award two marks for the main points and max one for any detail of one point*
- use of named appropriate machinery ; e.g. tractor / combine harvester
detail e.g. more efficient, sowing / harvesting / watering ;
(artificial) fertilisers ;
detail e.g. prevent mineral deficiencies / provide more nutrients ;
pesticides / insecticides / fungicides / AW ;
detail e.g. control, pests / diseases, feed / destroy / damage, crops ;
 A reduce losses to, pests / diseases
herbicides ;
detail e.g. control / kill, weeds / competitors ;
use of, hormones / named hormone(s) ;
detail e.g. reduce vegetative growth / promote fruiting / AW ;
irrigation ; **R** 'put on (more) water'
detail e.g. prevent water becoming limiting factor / not relying on rain / AW ;
glasshouses / greenhouses ;
detail e.g. control, light intensity / carbon dioxide concentration / temperature
- monoculture ;
detail e.g. easier to harvest ;
- genetic engineering / gene transfer / GM ; *ignore* genetic technology
artificial selection / selective breeding ;
detail e.g. improve, growth / aspect of yield / quality / disease resistance /
 pest resistance ; [max 3]
- (d) *idea that water content of plants varies ;* [1]
- (e) *idea that energy is lost, along a food chain / between maize and cows ;* [1]
- energy loss by animals to max 2*
food not eaten ;
food not, digested / absorbed ; **A** egested
(chemical energy) excreted ;
heat loss ;
movement ;
respiration ; [max 2]

1 (f) ($6O_2$; R $6O_2$ / $6O_2$ [1]

- (ii) large surface area / broad / wide ; R flat
chloroplasts / chlorophyll ;
leaf mosaic / leaves arranged to avoid shading ;
leaves, grow at right angles to light / move to follow the sun ;
cuticle / epidermis, thin / transparent ;
leaf is thin ;
palisade cells tightly packed ;
movement of chloroplasts towards light source ;
AVP ;

[max 2]

- (iii) root hair(s) ;
down water potential gradient / from high to low water potential / soil has
higher water potential / root has lower water potential ;
osmosis / across partially permeable membrane ;
A semi-permeable / selectively permeable R 'and active uptake'

[3]

- (iv) (carbon dioxide) diffuses (from air) / ref to down diffusion gradient ;
through stoma(ta) ;

air spaces, between (mesophyll) cells / in leaf ;
dissolves in water, on / in, cell wall ;
(diffuses) through, cell wall / membrane ;

carbon dioxide from, respiration / mitochondria ;

[max 2]

[Total: 19]

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- 2 (a) ref. to presence of feathers; (R) wings [2]
 ref. to presence of beak; ()
- (b)(i) each organism is given two names/ref. to genus and species/trivial;
 suitable example (*Oxyura jamaicensis* or *Oxyura leucocephala*); [2]
- (ii) cross-mating results in a fertile + duck/variety/offspring/sub-species/
 new species;
 they both belong to the + same genus/genus *Oxyura*;
 they are attracted to each other AW; max. [2]
- (c)(i) they also exist in America; (R) they exist in Spain [1]
 (R) refs to other parts of the world unequal.
- (ii)
- ref. to hunting/more predators;
 - ref. to destruction of habitat;
 - ref. to pollution;
 - ref. to disease;
 - ref. to loss of food/more competition for food or other named factor;
 - ref. to change in climate/sudden change in environment;
 - ref. to very small population; max. [1]
- (d)
- food chains only show one source of food for each level in a food chain AW;
 - ref. to two different organisms at secondary consumer level AW;
 - ref. to no information about link between seeds and insect larvae AW;
 - Ruddy duck feeds + as herbivore and carnivore/at two different levels/ as an omnivore AW/has two different sources of food;
 - Ruddy ducks have two different predators AW;
 - A is a straight line/a food web is a network AW; max. [2]

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Total 10
