

# Organisms and their Environment

## Mark Scheme 7

<b>Level</b>	IGCSE
<b>Subject</b>	Biology
<b>Exam Board</b>	CIE
<b>Topic</b>	Organisms and their Environment
<b>Paper Type</b>	(Extended) Theory Paper
<b>Booklet</b>	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  $6O^2 / 6O2$  [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]

- 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**  
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