

# Organisms and their Environment

## Mark Scheme 5

<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 5

**Time Allowed:** 69 minutes

**Score:** /57

**Percentage:** /100

1 (a) *idea that gene(s) are transferred* ; **A** genetic information / DNA **R** chromosome from one, species / organism, to another, species / organism ; [2]

(b) DNA / RNA / nucleic acid ; [1]

(c) (i) testosterone ; **R** spellings with 'oge' [1]

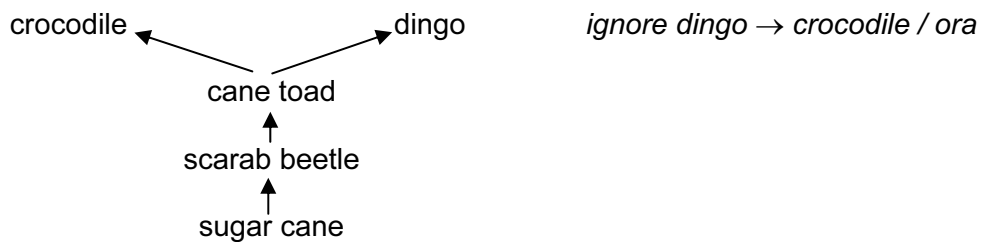
(ii) voice will break / AW ;  
 hair on, chest / face / under arms / in pubic area / around sex organs ;  
 shoulders broaden ;  
 muscle develops ;  
 penis enlarges ;  
 testes / scrotum, enlarge ; } **A** genitals, grow / enlarge  
 produce, sperm / seminal fluid / AW ;  
 named behavioural change ; [max. 2]

*put ticks and crosses in a column on right hand side of answer*

(d) (i) (x axis) time / years / months ;  
 (y axis) number of toads / number of individuals / population / AW ;  
**R** 'toads' unqualified **A** 'amount of toads'  
 S shaped curve ;  
 exponential / log, phase labelled on straight part of curve (bracket or line) ; [4]

(ii) (lack of) food / prey ; **A** fewer scarab beetles  
 ref. to habitat change or damage ;  
 change in temperature / global warming ;  
 ref. to pollution ;  
 (bacterial) disease / parasite ;  
 (lack of) breeding places ;  
 shortage of water / drought ; [max. 1]

(e) (i) *ignore references to virus*



i. arrows must point from food to feeder (even if incorrect organisms) ;  
 ii. all five organisms included in correct order with lines even if no arrows ;  
**A** if more organisms included [2]

(ii) *no other answers are acceptable*  
 (carnivore) cane toad + dingo + crocodile ;  
 (herbivore) scarab beetle ;  
 (producer) sugar cane ; [3]

[Total: 16]

2 (a) (MAX. 2 IN EACH SECTION)  
(developing country)

largest % is at 0-5 years old ;  
% decreases as age increases ;  
smallest % over 65 years old ;

(developed country)

small percentage of under 15s ;  
only small variation in % as age increases AW ;  
relatively high % survives beyond 65 years old ;  
largest group is 40 - 45 years old ;

[max. 3]

(b) the developing country has a larger % ;  
the % decreases in the developing country / % shows little change with age in the developed country / less infant mortality in developed country ;

[max. 1]

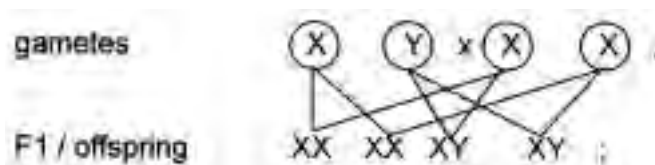
(ii) more over 65s in developed country ;  
max. age is 80 in developing country + 90 in developed country ;

[max. 1]

(c) (both have) more females than males ;

[1]

(d) male / father = XY + female / mother = XX ;



So, ratio = 1 : 1 ;

[4]

(e) BOTH ANSWERS MUST BE CORRECT FOR THE MARK

	average life expectancy
developing country	54
developed country	74;

[1]

(ii) ref. to better health care or medical facilities + in developed countries ;  
(or v.v)

ref. to more disease in developing countries ; (or v.v)

ref. to better diet in developed countries AW ; (or v.v)

ref. less food available in developing countries ; (or v.v)

ref. to more wars in developing countries ; (or v.v)

[max. 2]

[max. 13]

- 3 (a) (i) deforestation / slash and burn ; 1
- (timber use) (ii) ref. (to timber) for housing / furniture / wood / paper / fence posts AW ;  
 (land use)(spaces) ref. to (timber for) fuel AW ; **A** burn to keep warm max. 2  
 ref. to roads / industry / housing / airports / other use of land ;
- (iii)
- i. ref. to soil erosion / mudslides / silting of rivers / desertification / dust bowl ;
  - ii. due to lack of (tree) roots to stabilise soil ; (linked to i.)
  - iii. ref. to increased risk of flooding ;
  - iv. due to lack of trees to slow down water ; (linked to ii.) **A** leaf litter absorbs water
  - v. ref. to leaching of soil / minerals washed out / soil becomes infertile ;
  - vi. can lead to eutrophication of rivers / lakes AW ;
  - vii. less photosynthesis / burning or rotting wood ;
  - viii. less CO<sub>2</sub> absorbed from atmosphere / more CO<sub>2</sub> produced / in atmosphere ;
  - ix. ref. to global warming / greenhouse effect ; (linked to vii. or viii.)
  - x. ref. to drop in oxygen in atmosphere AW ;
  - xi. less rain (change in weather) ;
  - xii. due to less transpiration AW ; (linked to xi.)
  - xiii. ref. to reduction of habitats AW / habitats split up AW ;
  - xiv. ref. to disruption of food chains / loss of food ;
  - xv. so animals / plants + can become extinct or numbers depleted / loss of biodiversity ;
  - xvi. ref. to loss of genes / sources of chemicals for medicines AW ;
  - xvii. ref. to more pollution + due to smoke / road traffic / factories AW ;
  - xviii. ref. loss of income + tourism max. 6
- (b) MAX. 3 IF ONLY ONE NUTRIENT IS USED  
 IGNORE ENERGY REFS PROTEIN
- (fat) i. soya contains less fat ; **A** both sets of figures  
 ii. ref. to less cholesterol ;  
 iii. less risk of atherosclerosis / blockage of arteries / atheroma / stroke ;  
 iv. less risk of a heart attack / heart disease AW ;  
 v. ref. to less risk of obesity ; (O.R.A.)
- (fibre) vi. soya contains (more) fibre ; **A** both sets of figures  
 vii. so there is less risk of constipation (prevents) ;  
 viii. less risk of colon cancer ;  
 ix. fibre absorbs or removes toxins ; (O.R.A.) max. 4
- (ii) FOOD CHAINS MUST USE NAMED ORGANISMS **R** plant etc.
- i. (soya food chain) soya → human ; **A** description
  - ii. (corned beef food chain) grass → cow → human ; **A** description
  - iii. beef food chain has an extra level AW / has extra link / beef food chain longer ;
  - iv. energy lost through food chain / 90% energy lost at each level;
  - v. more energy is lost in beef chain ;
  - vi. example of energy loss e.g. body heat / movement of animal / not all food digested / energy lost in faeces / urinating / excretion / respiration / egestion ;
  - vii. in food chain there is more biomass in soya than in cows ; **R** more producers than consumers unequal. **R** less energy in beef than soya max. 4
- total max. 17**

- 4 (a) (i) ref. to moist skin ; [1]
- (ii) mammal ;  
bird ;  
fish ;  
reptile ; [max. 2]
- (b) ref. to both belonging to the same genus (or ref. to Bufo) ; [1]  
(ignore refs. to both animals being toads)
- (c) ref. to sand dunes becoming developed for + camp sites ;  
ref. to habitat is changing e.g. to woodland ; Ⓐ ref. to loss of habitat  
natterjacks cannot survive in colder habitats AW ; [max. 2]
- (d) ref. to some heathland or sand dunes becoming protected areas AW ;  
ref. to removal of trees / seedling trees AW + from heathland ;  
ref. to creation of more heathland / sand dunes + introduction of natterjacks ;  
ref. to captive breeding programmes ; [max. 2]
- (e) secondary consumer / third level ; Ⓐ (top) carnivore [1]
- (ii) insect larvae + adult insects ; (BOTH NEEDED FOR 1 MARK) [1]
- (iii) ref. to a wider range of food sources AW ; [1]
- [max. 11]