

# Organisms and their Environment

## Mark Scheme 5

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

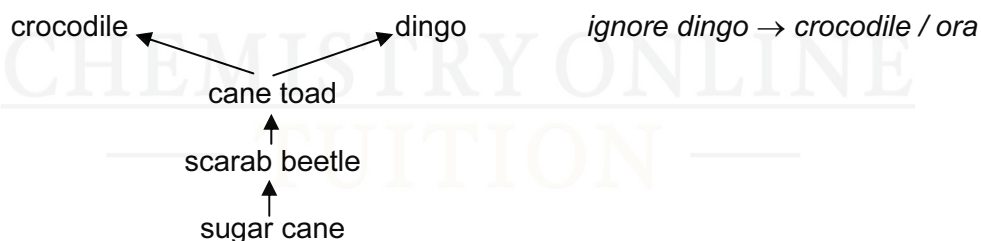
(ii) voice will break / AW ;  
 hair on, chest / face / under arms / in pubic area / around sex organs ;  
 shoulders broaden ;  
 muscle develops ;  
 penis enlarges ;  
 testes / scrotum, enlarge ; } **A** genitals, grow / enlarge  
 produce, sperm / seminal fluid / AW ;  
 named behavioural change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

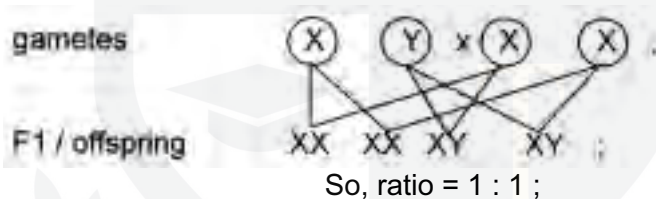
- (ii) more over 65s in developed country ;  
max. age is 80 in developing country + 90 in developed country ;

[max. 1]

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

[1]

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



[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]

<b>3</b>	<b>(a)</b>	<b>(i)</b>	<u>deforestation</u> / <u>slash and burn</u> ;	<b>1</b>
(timber use) (land use)(spaces)	<b>(ii)</b>		ref. (to timber) for housing / furniture / wood / paper / fence posts AW ; ref. to (timber for) fuel AW ; <b>A</b> burn to keep warm ref. to roads / industry / housing / airports / other use of land ;	<b>max. 2</b>
	<b>(iii)</b>			
		i.	ref. to soil erosion / mudslides / silting of rivers / desertification / dust bowl ;	
		ii.	due to lack of (tree) <u>roots</u> 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.) <b>A</b> 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	<b>max. 6</b>
	<b>(b)</b>		<b>MAX. 3 IF ONLY ONE NUTRIENT IS USED IGNORE ENERGY REFS PROTEIN</b>	
(fat)		i.	soya contains less fat ; <b>A</b> <u>both</u> 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 ; <b>A</b> <u>both</u> sets of figures	
		vii.	so there is less risk of constipation (prevents) ;	
		viii.	less risk of colon cancer ;	
		viii.	fibre absorbs or removes toxins ; (O.R.A.)	<b>max. 4</b>
	<b>(ii)</b>		<b>FOOD CHAINS MUST USE NAMED ORGANISMS R plant etc.</b>	
		i.	(soya food chain) soya → human ; <b>A</b> description	
		ii.	(corned beef food chain) grass → cow → human ; <b>A</b> 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 ; <b>R</b> more producers than consumers unequal. <b>R</b> less energy in beef than soya	<b>max. 4</b>
				<b>total max. 17</b>

- 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]

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