Human Influences on Ecosystems Mark Scheme 7

Level	IGCSE
Subject	Biology
Exam Board	CIE
Торіс	Human Influences on Ecosystems
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 7

CHEMISTRY ONLINE

Time Allowed:	62 minutes
Score:	/51
Percentage:	/100

Question	Expected Answers	Marks	Additional Guidance
1 (a)	little / very little, increase up to 1850 all have increases ; coal from around 1850 ; petroleum from 1920 / gas from late 1940s ; coal reached a peak in 1990s ; coal only one showing decrease ; oil decreased in 1970s ; steep increase in use from 1950s ;		
	comparative data quotes ;;	[max 5]	
(b)	hydrocarbons to max 3 produce carbon dioxide ; greenhouse gas ; carbonic acid / acid rain ; smoke / particles ; compounds of sulfur produce sulfur dioxide ; sulfuric acid / acid rain ;	[max 4]	allow acid rain once in answer
	CHEMICTI	v	NIL INTE
(c)	fossil fuels are, non-renewable / AW ; conserve for future generations ; more efficient ways of using them in the future ; alternatives are, expensive / not reliable ; AVP ;	[max 2	
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2	(a)	(i)	am	nylase A carbohydrase	[1]	lg odd spelling
		(ii)	1 2 3 4 5	starch is not soluble / large /complex fungus does not, secrete / produce, amylase for absorption (of glucose) / AW ref to, respiration / growth, (of fungus) as nutrient, for fungus / fermentation / AW	[max 2]	Mpt 2 A ecf from (i) / carbohydrase / enzyme to digest starch
	(b)	1 2 3 4 5	oth cor rec cor / O sto	ner fungi / bacteria / virus / other microorganisms mpete for nutrients duce productivity / yield / quality ntaminate the product / produce toxic <i>or</i> harmful product PRA op the process (early) and sterilise fermenter	[max 2]	R contaminate unqualified



2	(c)	2 3 4	energy is lost, between / within, trophic levels / along food chain animals are, at second trophic level / primary consumers OR plants are, autotrophs / producers / first trophic level (energy lost) in animal respiration / heat / (named) metabolic process / movement ref to (more) material that is inedible / not digestible (in longer food chains)		lg ref to healthy diet ref to 100→10→1
		5 6	ref to 10% energy transfer / ORA less pollution (from farm animal waste)	[max 3]	Mpt 6 A plants use CO ₂
	(d)	1 2 3 4 5 6 7 8	cheaper requires less energy as less is lost along food chain mycoprotein can be made anywhere / less land (in fermenters) less (animal) waste better for animal welfare / more ethical lower in fat / lowers risk of <u>heart</u> disease suitable for, vegetarians / vegans AVP e.g. quicker, contains fibre, disease free	[max 3]	Note: Use list rule R longer shelf life, help food shortages, more protein, more nutrients, easier to digest
	(e)	1 2 3 4 5 6	mycoprotein / fungus production requires supply of corn (starch) this comes from crop plants (fungus) still need to be grown (manufacture) requires energy rate of food supply cannot keep up due to overpopulation AVP e.g. does not contain all nec nutrients, may be consumer resistance to eating mycoprotein foods / needs flavourings / unbalanced diet	[max 3]	R required machinery
			- TUITIC	[Total: 14]	

3	(a)	(i)	(80 50 OF	0 – 30 = 50) / 30 x 100 R max – min / original x 100 = 167 / 166.7 (%)	[2]	two marks for the correct answer (167) if answer incorrect, allow one mark for the correct working / formula R 166, Ig sig figs
		(ii)	1 2 3 4 5 6 7 8	increase in human population / more people to feed more crops being grown / higher yield less land available for farming (land lost to housing etc) farming has become more intensive / technological / less subsistence / AW less use of crop rotation / less land left fallow / monoculture / less use of legumes prevents soil becoming depleted of nitrogen (compounds) new varieties of crop plants have high demand AVP e.g. cheap, easy	[max 3]	
	(b)	(i)	1 2 3 4 5 6 7 8	protein (in manure) broken down / decompose to amino acids by (named) decomposers, in context amino acids / proteins, deaminated deamination described urea converted to ammonia ammonia / ammonium ions, to nitrite / nitrate ions nitrite to nitrate ions nitrification / nitrifying bacteria, in context	[max 4]	
		(ii)	1 2 3 4 5 6 7 8	legumes contain nitrogen-fixing bacteria / rhizobium in root nodules nitrogen fixation / convert nitrogen (in atmosphere) to ammonia / amino acids / organic forms of N transferred to legume for making protein increases N (in soil) for <u>next</u> crop reduces need to use chemical fertilisers legumes are good source of protein crop rotation reduces effects of, pests / diseases	[max 3]	

3	(c)	1 2 3 4 5 6	waters <u>eutrophication</u> growth of algae / algal bloom light blocked / toxic substances released by algae (fixed) water plants die algae / plants, decayed by bacteria aerobic respiration		
		7	oxygen concentration decreases in context		
		8	animals / fish, migrate / die, in context		
		9 10 11	<i>land</i> reduction in organic content of soil soil / fertilizer, blown / washed / leached, away A erosion of soil increase in soil acidity		
		12 13 14 15	atmosphere increases loss of nitrous oxide / NO_x to the atmosphere nitrous oxide / NO_x , is a greenhouse gas carbon dioxide from combustion of fossil fuels / in production of fertilisers greenhouse effect / global warming, in context		Mpt 15 linked with mpt 13 or 14
		16	<i>humans</i> qualified health effect on humans / livestock	[max 5]	e.g. blue baby syndrome, accumulation in dioxins
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Que	estion	E Answers	Marks	Additional Guidance
4	(a)	Gallirallus ;	[1]	R Galliralus calayanensis
	(b)	(clearing land for) agriculture ; roads / transport ; housing ;		
		timber qualified ; e.g. for building material AVP ; e.g. mining / industrialisation	[max 3]	A furniture manufacture / paper
	(c)	<i>decrease</i> habitat loss ; fewer nesting sites ; less reproduction ; ref to, camouflage / exposed to predation ; less food / food chain disrupted ; more competition ; higher temperature / more exposure to storms / AW ;		No credit for 'decrease' / 'extinction' / 'increase' without qualification
		<i>increase</i> fewer predators ; more food ; fewer competitors ; simpler food web ;	[max 3]	

4	(d)	Question asks for reasons why conserving species is important – answers must be in this context		
		<i>ecological</i> ref to food chain / food web :		R become extinct without further qualification
		interdependence / AW ; <i>aesthetic</i> species are unique / AW ; (eco)tourism ; ref to biodiversity ;		A maintain / balance ecosystem A 'knock-on' effects / possible example / AW
		retain genes / maintain gene pool / AW ; qualified potential use for humans ; AVP ; e.g. ethical considerations for future generations to appreciate	[max 2]	
		Т	otal: 9]	

