

# Human Influences on Ecosystems

## Mark Scheme 13

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Human Influences on Ecosystems
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 13

Time Allowed: 44 minutes

Score: /36

Percentage: /100

- 1 (a) ( *mycoprotein has* *accept converse answers for beef*  
less protein / figures compared ;  
less fat / figures compared ;  
 fibre / figures compared ; **A** roughage  
 carbohydrate / figures compared ; [max 2]
- (ii) *assume answers are about mycoprotein*  
less fat / 9.2 g compared to 48.6 g / 39.4 g less fat / 5× less fat ;  
 so less risk of + heart disease / heart attack / blockage of arteries / obesity ;  
**A** 'clogged' / 'furred' / hardening *ignore* diabetes  
 fibre / 19.5 g compared to 0 g ;  
 so less risk of, constipation / bowel cancer ;  
**A** faster transit time / helps peristalsis / easier defecation explained [4]
- (b) ( *award two marks if correct answer (1.7) is given*  
*if no answer or incorrect answer award one mark for correct addition to get*  
 98.3  
 $49 + 9.2 + 19.5 + 20.6 = 98.3$   
 $100 - 98.3 = 1.7$  (g) ;; [2]
- (ii) *accept first answer on the line*  
 mineral(s) / named mineral / ions / salt(s) / vitamin(s) / named vitamin ;  
 calcium / potassium / sodium / magnesium / iron / phosphate / iodine / zinc  
**R** nitrate / sulphate / micronutrients [1]
- (c) ( glucose / sucrose / lactose / maltose / sugar(s) / molasses / corn steep  
 liquor ; **A** carbon source  
 minerals / mineral salts / vitamin(s) ;  
 ammonia / ammonium / amino acids ; **A** nitrogen source [max 2]
- (ii) filter / separate liquid from solid / retain solids / AW ; [1]
- (iii) carbon dioxide ; **A** CO<sub>2</sub> [1]
- (d) ( 24 °C ; **A** a temperature within range 20 to 30 °C [
- (ii) *ignore refs to the paddle*  
 heat released / exothermic ;  
 (during) respiration / metabolism / fermentation ; [2]
- (iii) constant, production / growth ;  
**A** optimum temperature / produce antibiotic as fast as possible  
 low temperature will slow down, enzyme action / fungal growth ;  
 high temperature will, denature enzymes ; **R** if 'and too low'  
 high temperature will kill fungus ; **R** if 'and too low'  
 high temperature may breakdown, product / antibiotic / penicillin ; [max 2]
- (iv) use a water jacket ; [1]

[Total: 19]

2	(a)	(i)	deforestation / slash and burn ;	1
	(timber use)(land use)(spaces)	(ii)	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 ;	max. 2
		(iii)	<ul style="list-style-type: none"> <li>i. ref. to soil erosion / mudslides / silting of rivers / desertification / dust bowl ;</li> <li>ii. due to lack of (tree) <u>roots</u> to stabilise soil ; (linked to i.)</li> <li>iii. ref. to increased risk of flooding ;</li> <li>iv. due to lack of trees to slow down water ; (linked to ii.) <b>A</b> leaf litter absorbs water</li> <li>v. ref. to leaching of soil / minerals washed out / soil becomes infertile ;</li> <li>vi. can lead to eutrophication of rivers / lakes AW ;</li> <li>vii. less photosynthesis / burning or rotting wood ;</li> <li>viii. less CO<sub>2</sub> absorbed from atmosphere / more CO<sub>2</sub> produced / in atmosphere ;</li> <li>ix. ref. to global warming / greenhouse effect ; (linked to vii. or viii.)</li> <li>x. ref. to drop in oxygen in atmosphere AW ;</li> <li>xi. less rain (change in weather) ;</li> <li>xii. due to less transpiration AW ; (linked to xi.)</li> <li>xiii. ref. to reduction of habitats AW / habitats split up AW ;</li> <li>xiv. ref. to disruption of food chains / loss of food ;</li> <li>xv. so animals / plants + can become extinct or numbers depleted / loss of biodiversity ;</li> <li>xvi. ref. to loss of genes / sources of chemicals for medicines AW ;</li> <li>xvii. ref. to more pollution + due to smoke / road traffic / factories AW ;</li> <li>xviii. ref. loss of income + tourism</li> </ul>	max. 6
		(b)	MAX. 3 IF ONLY ONE NUTRIENT IS USED IGNORE ENERGY REFS PROTEIN	
	(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.)	max. 4
		(ii)	FOOD CHAINS MUST USE NAMED ORGANISMS <b>R</b> plant etc.	
		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	max. 4
				total max. 17