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5014 ENVIRONMENTAL MANAGEMENT

5014/01 Paper 1, maximum raw mark 120

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

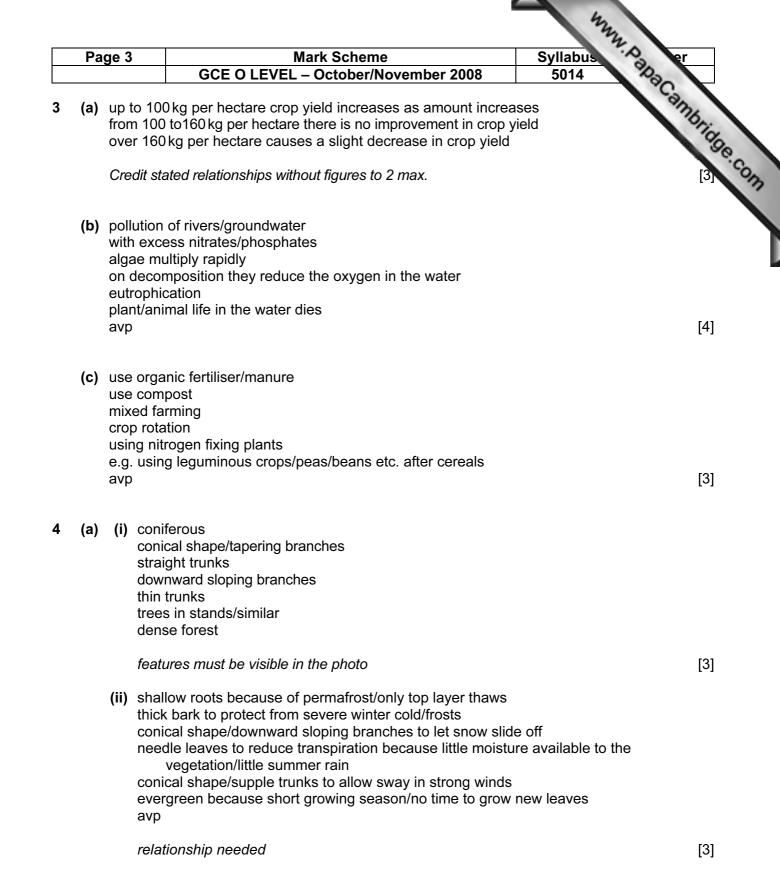
All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

Pane	2	Mark Scheme	Syllabus	A or
Page	2	GCE O LEVEL – October/November	2008 5014	2b2
(a) (i)) The	e north has most cultivable land but little/less	water resources	Canb
(ii)	,	er is to be diverted from the south to the northing canals (from rivers/dams)	٦	Papa Cambrid
(iii)	cost mar polle the culte diffie wate	at cost t/difficulty of tunnelling through mountains/un ny people will have to leave their homes ution might spread further/ecosystem altered climates of the two regions might be change ural/historical features might be destroyed/ne culty of working in the remote west/Tibet culty of working in great cold/frozen condition er diverted by western canals would normall difficult relationships	l d ed moving s in Tibet/on high mountain:	s/plateau
	silt a vp	accumulates in reservoirs/dams		[4]
Wa	ater tre ewage vp i) impo	nalties for polluters eatment treatment permeable rock for the rock above and below for the layer above the water – dense shading		[3]
		for the layer above the oil – circles	3	[3]
(ii	i) anti	icline/upfold		[1]
(iii	sea	ologists examine rocks in the field/aerial photo irch for structures likely to contain oil/gas smic surveys/use of gravimeters/magnetome		
	avp	0		[2]
m ex sp wa he th	ight no xtreme bills col armth eated r erefore	on removed during pipeline construction ot re-grow as before cold might cause breaks in pipeline buld kill plants/animals/effect on biodiversity a could melt permafrost/frozen ground river water/thermal pollution e river life might die might hinder migration of animals	is argued	



Pa	ige 4		Mark Scheme Syllabus	•
			GCE O LEVEL – October/November 2008 5014	
(b)	(i)	sola	r/sunlight	76.
	(ii)	quie pow will g avai no/li little <i>avp</i>	Mark Scheme Syllabus GCE O LEVEL – October/November 2008 5014 r/sunlight n/non-polluting source of power (important in a National Park) t source of power will not disturb fauna er for many hours each day in summer because long hours of daylight (in taiga zone/cool interior climate/high latitudes) give most power in summer season when most tourists visit lable where no other power available/not near electricity grid ttle power when no sun power as sun is at a low angle in the sky (in the taiga region/cool interior climate high latitudes) must have at least one from each group for max. ery well developed point can be awarded two marks	
(a)	(i)	X inf Y ru	filtration noff	[2]
	(ii)	read	os down through spaces in the soil thes permeable rock s/passes through gaps/pores within the rock	
		Any	two	[2]
	(iii)	Lette	er I placed anywhere within the wooded area	[1]
	(iv)	dow less	e quickly n valley side slope speeding up surface runoff surface resistance of flow over the agricultural land ecially where the field is ploughed down the slope	
		large com	e slowly e area of woodland at top of slope to intercept rain ment about how interception reduces runoff neable rock under the soil so that some can penetrate underground	
			3 marks for an answer referring only to more quickly or slowly. credit a clear reference to the different areas and their rates of runoff	
		4 po	ints made along the lines suggested.	[4]
(b)	wat wat eas fish eas ofte flat	er su er su y was ing/fc y acc en fert land	reasons: pply for drinking pply for other uses e.g. washing, industrial use, power supply ste disposal ood supply cess/transport tile silt soils for farming in surrounding areas areas are on sides of rivers ee valid reasons provided that they are obviously different or made to be	
	-		, like the water supply examples above	[3]

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(c) (i)	Mark Scheme Syllabus GCE O LEVEL – October/November 2008 5014 workers killed and injured smoke/air pollution 40,000 residents evacuated from their homes toxic leak into river Any two Any two	mbrides
	Any two	[2]
(ii)	Harbin was lower down/downstream from the leak into the river slick was too big (80km long) to be diluted/dispersed before reaching Harbin officials made no attempts to control or stop the slick	
	Maximum 1 mark for merely quoting relevant information from the source Two mark answers include comment/context	[2]
(iii)	Songhua River flows across the border into Russia towns along the river in Russia like Khabarovsk use river water for drinking China waited at least a week before informing Russia of the toxic leak China did nothing to clean up a large slick like this comment about likely Russian views on this.	
	Points made along these lines 3 @ 1 mark	[3]
(iv)	Only real fact was that the main slick had moved downstream of the city Perhaps half accurate was the statement that the water flowing in the river was now clean/safe water However, water was not safe/chemicals still likely to be present according to what the expert living outside China said; nitro-benzine is a highly dangerous substance for humans Possible that will affect people for a long time – especially since the leak was enormous (80km long slick) causing likely high concentrations; breakdown likely to be slow in cold water in winter Possible that humans would be affected not only by drinking the water but also by eating fish from the river	t e e
	Mark explanation which supports the view or views expressed.	[4]
(d) (i)	Plots – 10 or more correct = 2 marks – at least 4 correct = 1 mark Line used to link the candidate's plots = 1 mark	[3]
(ii)	Summer/June to September (or October)	[1]
(iii)	Although June & July were the wettest months, there had been 6 or 7 dry months before rivers and ground could take more rainfall without flooding than after 3 months or high rainfall between 1400 & 1500 mm of rain fell in the three months before September it takes time for rivers to fill up from all the tributaries and start flooding	
	Some idea of the reasons why = 1 mark Understood, particularly if supported by a specific reference to precipitation values = 2 marks	; [2]

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(iv)	One answer is April = 1 mark Explanation – either zero precipitation, or better still it is preceded by at least very dry months (each with only a trace of rainfall); also allow high temperatures leading to high rates of evaporation Choice of May = 1 mark also; similar explanation based on length of preceding dry months; higher temperatures and high evaporation are even more valid When another month is chosen, no mark for choice, but one mark is possible for valid explanation (easier to achieve the closer the month is to April/May)	bridge [2]
(v)	Description of a method of irrigation – any acceptable (canal, sprinkler, large or small schemes etc.) although trickle drip is the only method of irrigation actually named in the syllabus. water storage (from dam, reservoir, river etc) method of transfer (if different from above) pipes with small holes in them water trickles out around the plants only where they are growing reduces amount of water used/chances of salinisation	
	Three points made along these lines for this or for another method of irrigation Also, credit answers about dry farming techniques and development of new drought resistant varieties of seeds, provided the context is made relevant.	[3]

 (e) (i) Benefits of high rainfall and river floods for farmers include: deposits of fertile (silt) soils after floods filling up reservoirs/ponds/rivers used for irrigation water supply water seeping into ground and raising level of water table renews the grass/vegetation in areas of livestock grazing standing water essential for some crops such as wet padi

Any two – accept other points provided that they relate to farming.

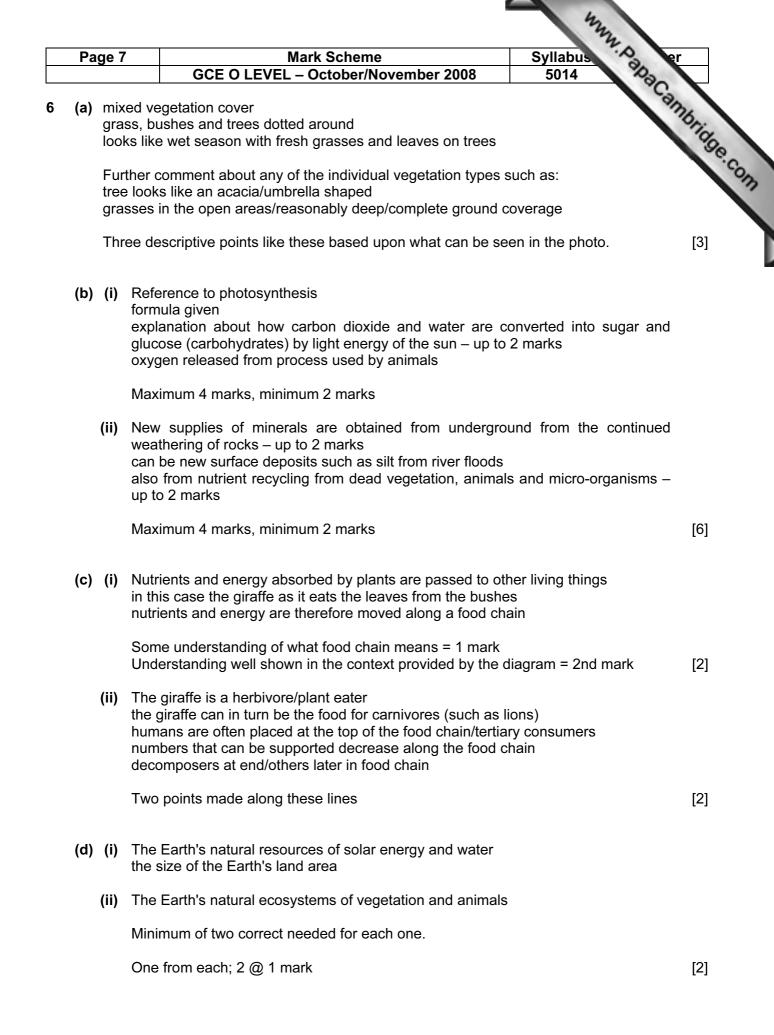
(ii) Agree – some of world's most productive farming areas, with highest densities of population are found on flood plains and deltas, especially in Asia – without annual floods and wet summers none of this would be possible. Reward references to examples. In these areas flooding on a larger scale than normal may cause loss and damage, but not as great as would be caused by non-arrival of the rains

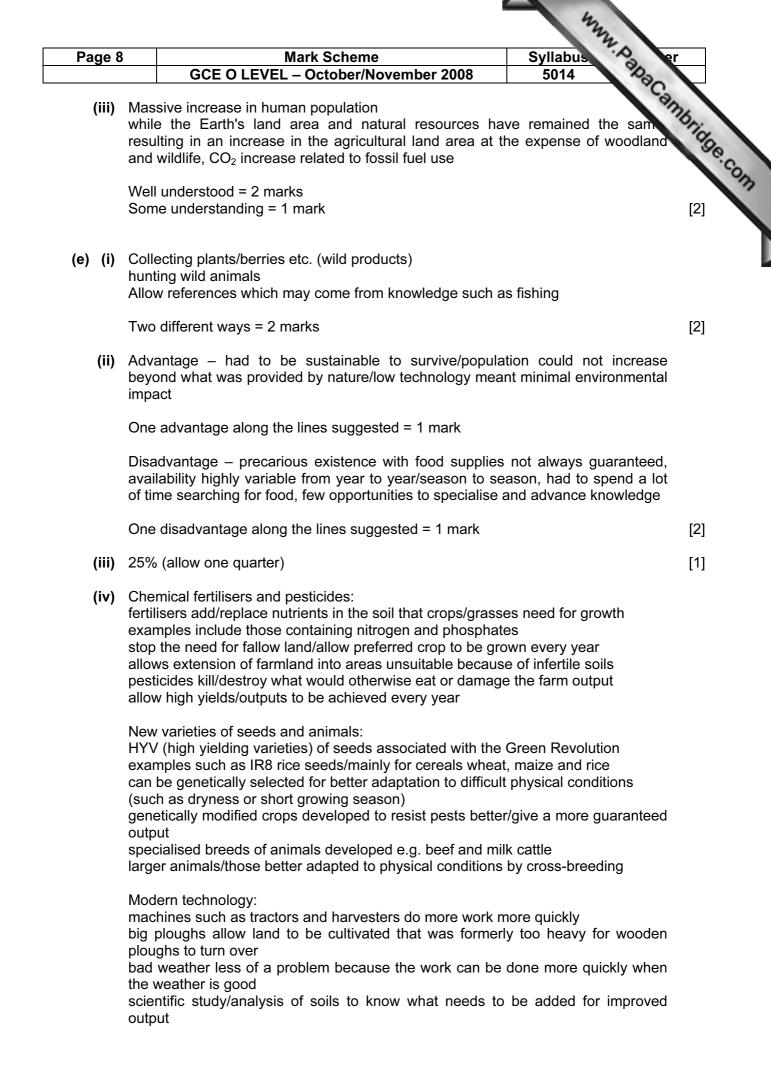
Disagree – flooding is a major natural hazard which kills people and animals, ruins crops, destroys property, spreads water related diseases, keeps people stuck in the poverty trap, holds back economic development etc. Examples of bad floods could be used to support answers.

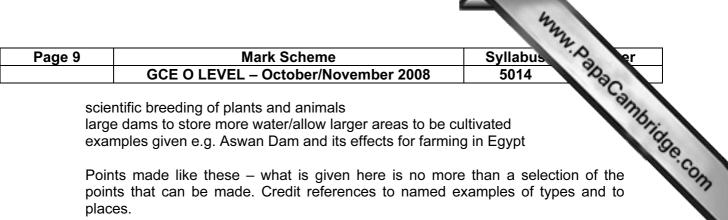
No mark for view held – all views from total agreement to total disagreement are equally acceptable. Instead reward the explanation. Strong explanation which supports the view expressed = 3 or 4 marks Some explanation, but less well developed; view not always clear = 1 or 2 marks [4]

[Total: 40]

[2]







Points made like these – what is given here is no more than a selection of the points that can be made. Credit references to named examples of types and to places.

Maximum 4 marks, minimum 2 marks for each reason chosen

[6] [1]

- (f) (i) Other temperate forests
 - (ii) Reasons which could be used:

suitability or otherwise of physical conditions for farming - polar and coniferous forests more difficult, cold environments than temperate and tropical areas with their higher temperatures; within the tropics savanna has more rainfall and vegetation than hot deserts, while access is easier than in the high density rainforests where heavy rain falls all year

levels of technology – advances in modem technology/Industrial Revolution began in temperate lands, which allowed more forests to be cleared, more people had to be fed, more land needed for farming etc. Most developed countries are located in temperate areas; developing countries are located mainly in the tropics

One answer/theme can be good enough for full marks - reward according to validity of points made i.e. according to the worth of the answer. For all three marks some comment towards the theme of variation between ecosystems is needed.

- (iii) Tropical rainforest
- (iv) Community forestry:

planting trees to fill/replace gaps in forest especially in vulnerable areas such as on slopes make use of forest products such as rubber instead of clearance use dead branches etc. for firewood rather than chopping trees down educate and train local people into sustainable ways of use

Agro-forestry:

plant fast growing agricultural tree crops like rubber and oil palm maintain a complete forest/vegetation cover to prevent soil damage the tree crops can be used to shelter smaller food crops wood needed for other purposes such as fuel can be provided by planting patches of fast growing eucalyptus trees

Sustainable harvesting of hardwoods: selective logging of trees of greatest commercial value taking out only mature trees and leaving the rest to grow to full size keep forest clearances small so that rapid regeneration is possible do a preliminary survey to find the most suitable logging areas check cutting of timber and ensure a long gap before next cutting

3 points such as these for chosen technique

[3]

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(v) Usually sustainable conservation measures are not easy to implement becaust restrictions imposed on what can be done, where and when increased costs of operations/make profits harder to achieve easier to clear all the forest with big machines than seek out the valuable trees which are dotted around within the rainforests often there are commercial, social and political pressures for use of resources examples of this e.g. by reference to the Amazon Basin many of remaining forests are located in developing countries which are seeking economic development controls over companies/developers are weak or not enforced; also widespread corruption
On the other side, there is more pressure upon governments and authorities from

On the other side, there is more pressure upon governments and authorities from environmental groups and international organisations to implement sustainable techniques. Possible to educate politicians and local people about the commercial benefits associated with sustainability. Problem is that benefits are medium and long term whereas non-sustainable methods bring immediate income.

Any view is acceptable, but candidates are likely to find it easier to support an answer which focuses on difficulty of implementation.

Answer worth 1-2 marks

Limited explanation; one idea may be stated (and perhaps restated) without much explanatory support.

Answer worth 3-4 marks

Fuller explanation used in support of the views expressed. The question is answered/supported by relevant detail/content. [4]

[Total: 40]