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Cambridge International General Certificate of Secondary Education

ENVIRONMENTAL MANAGEMENT

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MARK SCHEME
Maximum Mark: 60

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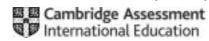
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Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer	Marks
1(a)(i)	849 000;	1
1(a)(ii)	13.1(%);; (if answer incorrect, allow one mark for 849 000 ÷ 6.5 [1]);	2
1(a)(iii)	Knox, Sumner, Sullivan, Cumberland, Lauderdale; counties correctly paired with their population (441 000, 166 000, 157 000, 57 000, 28 000);	2
1(b)(i)	190; 118;	2
1(b)(ii)	sulfate 315 (ppm); selenium 60 (ppm);	2
1(b)(iii)	stream B;	1
1(b)(iv)	as pH increases pollutants decrease / eq;	1
1(b)(v)	(stream) A ; because: lowest pH; highest value of, sulfate/aluminium/iron/manganese/selenium; AVP, e.g. calculated percentage compared to other streams or total ppm compared;	3
1(c)	any three from: selenium absorbed from water into plants/eq; then passed up the food chain; on to consumers; and top consumers; selenium cannot be excreted; so accumulates at each stage/bioaccumulates; so concentration, toxic/lethal to fish;	3

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Question	Answer	Marks
1(d)(i)	any two from: as a control experiment; so the data could be compared to polluted streams; so the degree/amount of pollution could be known;	2
1(d)(ii)	allow answers in range of 0.80–0.90 (m²);; (if answer incorrect, allow one mark for (count up squares) x scale [1]);	2
1(d)(iii)	B; A;	2
1(d)(iv)	any five from: measure a, known/stated distance along stream; mark each end with a post; drop the float in upstream; start timer as it passes first marker; stop timer when it passes second marker; record time; repeat (at least twice more); distance ÷ time = speed/velocity;	5
1(d)(v)	allow answers in range of 0.144–0.162;; (if answer incorrect, allow one mark for candidates answer to (d)(ii) × 0.18 [1]);	2
1(e)	any two advantages with one disadvantage OR any two disadvantages with one advantage: advantage: limestone is cheap; easy/quick; prevents death of organisms; disadvantage: changes shape of stream/could cause flooding/eq; not a long term solution/needs to be repeated/requires labour/eq; alters, food chains/food webs/habitat; it does not remove pollutants/eq;	3

Question	Answer	Marks
1(f)(i)	any two advantages with one disadvantage OR any two disadvantages with one advantage:	3
	advantage:	
	a long term solution;	
	does not add any chemicals;	
	only uses natural processes/eq;	
	no repeat treatments needed;	
	few pollutants enter stream;	
	disadvantage:	
	high initial cost;	
	damage to area in building/eg;	
	only suitable for some streams / ref to topography;	
	AVP, e.g. bacteria work best, at high temperatures/only during part of the year;	
1(f)(ii)	months May, June, July, August, September;	3
	reasons:	
	highest temperature means increased action of bacteria;	
	(increased) enzyme activity;	
	still plenty of water in wetland/eq so bacteria can live/eq;	
1(f)(iii)	any three from:	3
. (.)()	to check, that the system worked/pollution levels/eq;	
	at highest rainfall (May)/beginning of the hot season;	
	and lowest rainfall (Oct)/end of the hot season;	
	to compare results for each year/between May and October;	
	find out if water is safe to use;	

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Question	Answer	Marks
2(a)(i)	coal output (steadily) decreased / use of figures to illustrate the fall in production, e.g. 2.3 to 1.1/drop of 1.2;	1
2(a)(ii)	any one from: less coal available (to be mined)/eq; fall in demand/price; change to renewable sources; AVP;	1
2(b)(i)	orientation with linear scale; axes labelled: number of miners employed; year; plots correct;	4
2(b)(ii)	allow answers in range of 200–340;	1
2(b)(iii)	any two from: more machinery used; less coal to mine; less mines operating; miners move to other jobs, qualified;	2
2(c)	any five from: loss of natural landscape; deforestation; loss of habitats; loss of biodiversity; more erosion by wind; more erosion by water; increase risk of landslides; pollution/turbidity, of streams; pollution of groundwater; air pollution; dust reduces, plant growth/photosynthesis;	5

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Question	Answer	Marks
2(d)	any four from:	4
	YES: too much damage being done/high cost of restoration; people do not support it/no new licences; very few jobs; involves high cost of (long distance) transport; better things to spend state money on; most of the coal reserves have already been extracted; low quality coal not for burning; people want to use renewable energy sources; AVP;	
	NO: valuable export; foreign exchange; earns money for the, state/country; provides jobs; subsidies keep mining going; fossil fuels still needed for, energy/industrial use; AVP;	

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