



**Cambridge International Examinations**  
Cambridge Ordinary Level

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**ENVIRONMENTAL MANAGEMENT**

**5014/22**

Paper 2

**October/November 2016**

MARK SCHEME

Maximum Mark: 60

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**Published**

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, which would have considered the acceptability of alternative answers.

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(a)	it is the numbers / variety / eq; of different types / species / biological groups of living organisms / living things / plants and animals;	<b>2</b>
1(b)(i)	Tanzania;	<b>1</b>
1(b)(ii)	Rwanda; Burundi;	<b>2</b>
1(c)(i)	water would be contaminated after vehicle washing all day / eq / as a control / to compare results;	<b>1</b>
1(c)(ii)	41.6; 8.8;	<b>2</b>
1(c)(iii)	<i>any 3 of:</i> pH lower in all washing sites; phosphate higher; salinity higher; use of figures to support; ORA	<b>3</b>
1(c)(iv)	<i>any 2 of:</i> oil; petrol / eq; diesel; brake fluid; battery acid; shampoo / cleaning agents;	<b>2</b>
1(c)(v)	table drawn; headings; all data filled in a tally form;	<b>3</b>
1(d)(i)	<i>any 5 of:</i> fertiliser / phosphates / nitrates encourage algal growth / bloom; light cannot penetrate; so plants do not photosynthesise; algae / plants die; decomposed by microbes / eq; bacteria increase; oxygen used up / high BOD; (some) fish die / fish populations decrease;	<b>5</b>
1(d)(ii)	<i>any 1 of:</i> good source of, protein / omega oils / eq / vitamin A / vitamin D / iodine; helps children grow; maintains / boosts, immune system;	<b>1</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(d)(iii)	<i>any 1 of:</i> unhealthy: because of levels of, phosphate / sewage / named pollutant e.g. heavy metal; or healthy: because only small change in phosphate / not much sewage contamination / good source of protein / omega oils / eq / vitamin A / vitamin D / iodine;	<b>1</b>
1(e)(i)	<i>any 2 of:</i> (plan two is better as) more sites so more representative / better average; numbers counted rather than, presence / absence; same fixed time for counting snails / eq;	<b>2</b>
1(e)(ii)	as there are no sites without washing; no comparison is possible no control sites / eq;	<b>2</b>
1(e)(iii)	6.4;	<b>1</b>
1(e)(iv)	<i>any 2 of:</i> defined size of quadrat / eq; same number at each sample site; random sampling;	<b>2</b>
1(e)(v)	bilharzia / schistosomiasis / blood fluke / katayama fever / eq;	<b>1</b>
1(e)(vi)	human waste goes into river / swimming stage can get to water snail / eq; swimming stage burrows into human skin / eq;	<b>2</b>
1(e)(vii)	<i>any 2 of:</i> vehicle washing reduces snail numbers / eq; so less snail eggs; not enough food for (young) fish; so less adults to reproduce;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(f)(i)	B D A C; (any two correct = one mark) 4 correct = 2, 2/3 correct = 1	<b>2</b>
1(f)(ii)	<i>any 2 of:</i> ploughing down slope; run-off; no vegetation cover; wind erosion; animal wastes enter lake; overgrazing / over-cultivation; allow any suitable examples	<b>2</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(a)(i)	<i>any 1 of:</i> closest to lake / similar distance from lake / eq; two in wetland, two in savannah; so comparison possible / eq;	<b>1</b>
2(a)(ii)	<i>any 1 of:</i> at random from a list; every third house / eq; other valid sampling method;	<b>1</b>
2(a)(iii)	<i>any 2 of:</i> to collect data about all household activities / all points of view / division of labour / an example stated or described / eq; males not always head of household / eq; to avoid bias / incomplete data collection / eq;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(a)(iv)	<i>any 2 of:</i> so all the questions asked were the same / eq; to record all the information; so results were reliable; could be processed / summarised;	<b>2</b>
2(b)(i)	key completed; both axes fully labelled with appropriate scale (plots to cover at least half of the grid); one plotting error = two marks, two plotting errors = one mark);;	<b>4</b>
2(b)(ii)	no large difference between any assets; two examples quoted from, graph / table;;	<b>3</b>
2(b)(iii)	<i>any 2 of:</i> more people need to buy food; and less food being taken, to market / for sale; reference to supply and demand; physical factors such as, drought / heavy rain; AVP;	<b>2</b>
2(b)(iv)	<i>any 2 of:</i> questions such as: which type of, crops / named crops (e.g. maize, beans, sorghum) do you grow?; how big are your fields?; when are your harvesting times?; how much do you harvest?; how valuable is your harvest?; do you sell crops?;	<b>2</b>
2(c)	<i>any 4 of:</i> any suitable ideas in these four areas: sustainable / environmental / social / financial. agricultural advisors; laws about pollution; subsidies / eq / for, drought / pest resistant / high yield seed; control of local industries; control of land ownership; AVP;	<b>4</b>