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**ENVIRONMENTAL MANAGEMENT**

**5014/21**

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(a)(i)	7.7;	<b>1</b>
1(a)(ii)	9.058/9.06/9.1 (%); allow ecf from part <b>(a)(i)</b>	<b>1</b>
1(b)(i)	July, August, September;	<b>1</b>
1(b)(ii)	return to villages / work on land / loss of money / cannot buy food / cannot pay for, education / rent / medical treatment / eq;	<b>1</b>
1(b)(iii)	<i>any 3 of:</i> mosquitoes breed in water; so (more) people bitten; so (more) malaria cases; yellow fever / dengue fever; drinking water more polluted; so cholera / dysentery / diarrhoea; no money to treat diseases; max 1 for named disease	<b>3</b>
1(b)(iv)	noise drives away animals / stop them breeding / other effect on domesticated animals; reference to stress / annoyance / scared of noise;  dust reduced plant growth / leaves covered / eq; less photosynthesis; causes breathing problems; causes, eye / ear problems / eq;  reduced biodiversity (of plants / animals);  max 2 for noise and max 2 for dust	<b>4</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(c)(i)	<i>any 3 of:</i> safety masks; goggles / eq; protective clothes / eq; ear defenders / eq; helmets; boots; shelter from the sun; toilets;	<b>3</b>
1(c)(ii)	<i>any 2 of:</i> employers do not want to pay (unless they have to) / eq; business not profitable with these extra costs; reference to workers not organised in a union / eq; laws not enforced / no law exists / not employers problem;	<b>2</b>
1(d)	<i>any 4 of:</i> making a lake; landfill / infilling; create wildlife habitat / nature reserve; used for farming; further details such as adding topsoil / adding N fixing plants; planting, trees / plants;	<b>4</b>
1(e)	newest = 1; oldest = 3;	<b>2</b>
1(f)(i)	appropriate scale (plots to cover at least half of the grid); axes labelled (distance from top of waste pile / m and number of plants); one plotting error = two marks, two plotting errors = one mark;; allow bar or line graph	<b>4</b>
1(f)(ii)	increase in plants with distance (and then a plateau) / eq;	<b>1</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(f)(iii)	<p><i>any 4 of:</i>            number of plants increase;            less dust so more, growth / photosynthesis;</p> <p>number of species increase;            more suitable pH / eq;            pH goes down / eq;            more minerals / minerals more soluble / minerals can be absorbed;</p> <p>temperature does not change / eq;            so does not limit plant growth / eq;</p> <p>AVP;;</p> <p>allow ORA for all statements            allow max 2 marks for description and max 2 marks for explanation</p>	<b>4</b>
1(f)(iv)	<p><i>any 2 of:</i>            only one transect / more transects needed;            only one pile / more piles need to be sampled / eq;            the transect / pile, could have been anomalous / eq;</p>	<b>2</b>
1(f)(v)	<p><i>any 3 of:</i>            same variety of wheat plants grown / seeds from same source / eq;            split into two groups / experimental and control group;            dust applied to one group / eq;            all other conditions the same for both groups / eq;            measure rate of, photosynthesis / growth / seed production / mass of seed;            method repeated / replicated;</p>	<b>3</b>
1(g)(i)	<p>272 and 315 used;            = 86 / 86.3 / 86.34 / 86.35 / 86.4(%) (not 86.0)</p>	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(g)(ii)	<p>block makers:  slurry cheap / free;  no shortage of supply;  make more blocks;  so make more money / eq.;</p> <p>mine owners:  can sell waste;  no waste to dispose of;  so not breaking the law;</p> <p>max 2 marks for block makers and max 2 marks for mine owners</p>	<b>3</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(a)(i)	<p>suitable key:  livestock should be shown in the uplands but also allow livestock below the dam;  crops shown below the dam or on either side;</p>	<b>3</b>
2(a)(ii)	<p><i>any 2 of:</i>  valid reasons for the areas shaded such as:  plants need water for long growing season / eq;  flat land for growing crops;  animals only need some access to drinking water;  land above dam has some food for animals;  land not suitable for crops / eq;</p>	<b>2</b>
2(a)(iii)	<p><i>any 2 of:</i>  reference to, flow into ground / infiltration;  water table stays high / eq;  wells draw water from water table;  reference to methods used to remove water from wells;</p>	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(b)	<i>any 3 of:</i> have to provide aid; it will cost government money; government may need to ask for overseas aid; people will expect aid; government may not be able to provide correct support / eq; AVP; e.g. to save face / eq /to stop stockpiling /to prevent panic or anxiety;	<b>3</b>
2(c)(i)	systematic / random sample / description of any valid method;	<b>1</b>
2(c)(ii)	three more questions related to animal survival or productivity;;; layout (one question must have at least two answer options);	<b>4</b>
2(c)(iii)	8.6 / 8.57(%);	<b>1</b>
2(c)(iv)	<i>any 3 of:</i> some animals can extract more water from food; some animals are, more drought resistant / adapted / do not need much water; some animals can feed on anything; (buffalos) are valuable so villagers keep feeding them; AVP; accept converse statements	<b>3</b>