



ENVIRONMENTAL MANAGEMENT

5014/22

Paper 2

May/June 2017

MARK SCHEME

Maximum Mark: 60

Published

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This document consists of **7** printed pages.

Question	Answer	Marks
1(a)(i)	(900 / 25.7 =) 35;	1
1(a)(ii)	25;; <i>(if answer incorrect, allow one mark for 35×2 or = 70 [1])</i>	2
1(a)(iii)	<i>any one of:</i> saves buying them; to make more profit; AVP, e.g. recycling / environmental issue / small bags are scarce / expensive to buy;	1
1(a)(iv)	<i>any two of:</i> sand stolen; sand needs to be guarded at night; danger to life; AVP;	2
1(b)	<i>any two of:</i> vegetables supply; vitamins or any named vitamin; minerals or any named mineral; roughage / fibre; essential calories / supplies carbohydrate or protein or fat; prevent malnutrition; balanced diet;	2

Question	Answer	Marks
2(a)(i)	(A) anemometer; (B) rain gauge;	2
2(a)(ii)	thermometer / sunshine recorder / barometer / wind vane;	1
2(a)(iii)	<i>any two of:</i> grass surface; flat / stable ground; clear ground / away from trees or buildings / eq;	2
2(a)(iv)	7;	1
2(a)(v)	orientation and linear scale; x-axis fully labelled; y-axis fully labelled; all plots correct;	4
2(a)(vi)	April OR May OR June to September OR October;	1
2(a)(vii)	<i>any two of:</i> cheap or easy to construct; does not use too much labour / can be built by local people or farmers; more water bodies to feed nearby fields / eq; less relocation of people; <i>idea of less flooding;</i> AVP, e.g. easier to irrigate crops / greater access to water (to grow crops) / more sustainable / easier to repair / less pollutants likely to accumulate;;	2
2(a)(viii)	<i>any one of:</i> warm enough for plant growth; only a short dry season / eq;	1

Question	Answer	Marks
2(b)(i)	(solar / heat) energy absorbed at the surface / eq;	1
2(b)(ii)	0.0–0.5 m / 0–50 cm;	1
2(b)(iii)	(reversed shape due to) radiative or longwave cooling / cools most from the surface / it's the surface where the longwave radiation comes from / ORA / eq;	1
2(b)(iv)	<i>any three of:</i> <i>reference to</i> photosynthesis; further detail related to photosynthesis, e.g. optimal temperature for photosynthesis / photosynthetic rate increases / eq; <i>reference to</i> enzymes; further detail related to enzymes, e.g. discusses optimal temperature for enzymes; faster growth possible during day or when warm; some growth at night or cell elongation;	3
2(c)(i)	<i>after first year of cultivation</i> (rapid) drop from centre to edge of garden or from P to T ; <i>after three years of cultivation</i> same availability across garden / eq;	2
2(c)(ii)	<i>any two of:</i> more people / population increases; more food needed; no more land (can be cultivated); AVP;	2
2(c)(iii)	<i>any two of:</i> not enough or loss of, nutrients / nitrates or other named minerals / eq; <i>reference to</i> damaging soil structure / soil degradation; poor plant growth; plant prone to disease;	2

Question	Answer	Marks
2(d)(i)	table drawn; suitable headings; minimum of 4 cells to collect data;	3
2(d)(ii)	<i>any three of:</i> not all paths surveyed; only for, 3 hours / limited time; only, some / two days a week; do not know quantity or mass or weight of wood / only people counted; AVP;	3
2(d)(iii)	<i>any three of:</i> use more people to do the survey / eq; survey all or more paths; more days; more hours / more times, a day; weigh wood / other measurement; AVP;	3
2(e)	<i>any two of:</i> being burnt (by the fire); being scalding (by the contents); damage to lungs / respiratory or breathing difficulties / named lung condition / eq; damage to eyes; toxic or poisonous gases / carbon monoxide; food poisoning / undercooked food / named illness;	2

Question	Answer	Marks								
2(f)(i)	<p>6 correct [3] 4 to 5 correct [2] 2 to 3 correct [1]</p> <table border="1" data-bbox="775 352 1453 552"> <thead> <tr> <th data-bbox="775 352 1120 400"><i>open fire</i></th> <th data-bbox="1120 352 1453 400"><i>new type of stove</i></th> </tr> </thead> <tbody> <tr> <td data-bbox="775 400 1120 448">5.75 (allow 5.5 to 6.0)</td> <td data-bbox="1120 400 1453 448">3.75 (allow 3.5 to 4.0)</td> </tr> <tr> <td data-bbox="775 448 1120 496">15</td> <td data-bbox="1120 448 1453 496">10</td> </tr> <tr> <td data-bbox="775 496 1120 552">5</td> <td data-bbox="1120 496 1453 552">13</td> </tr> </tbody> </table> <p>∴∴∴</p>	<i>open fire</i>	<i>new type of stove</i>	5.75 (allow 5.5 to 6.0)	3.75 (allow 3.5 to 4.0)	15	10	5	13	3
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5.75 (allow 5.5 to 6.0)	3.75 (allow 3.5 to 4.0)									
15	10									
5	13									
2(f)(ii)	256;	1								
2(f)(iii)	<p>any two of: same volume of water; same quantity or mass of hay; same quantity or mass of beans; same size of box; same size pot; type or species of wood; AVP;</p>	2								
2(f)(iv)	<p>14 / 14.1 / 14.09;;</p> <p>(if answer incorrect, allow one mark for correct working or 42, e.g. $298-256 = 42$ [1])</p>	2								
2(g)(i)	<p>any three of: less wood used / wood saved; fewer trees cut down; trees can be replanted; wood is a renewable resource / eq; more food can be cooked (to supply an increase in population); less carbon dioxide emissions / reduced impact on climate / it's carbon neutral; save time for cooking or gathering wood / cooks faster; AVP, e.g. appropriate (sustainable) technology;</p>	3								

Question	Answer	Marks
2(g)(ii)	<i>any two of:</i> (limited) supply and (high) demand idea / ORA; (more) transport costs; AVP;	2
2(g)(iii)	<i>any two of:</i> not possible to cook on electricity due to cost; power cuts; supply of other fuel is unreliable; they know how to do it; reduce (running) costs / other fuel is more expensive; cools more slowly / keeps food hot for longer / cooks faster; safe to use;	2