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**ENVIRONMENTAL MANAGEMENT**

**0680/11**

Paper 1

**May/June 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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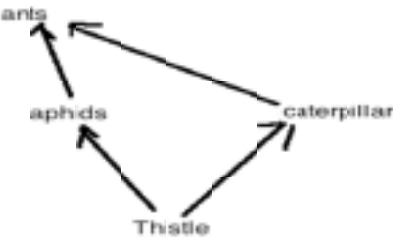
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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(a)(i)	400 + 1800 + 57200/59400 (÷ 266 000) ; = 22.3/22 (%) ;	<b>2</b>
1(a)(ii)	reference to valid building shape e.g. pyramid/conical shapes for buildings ; materials used e.g. springs/rubber in buildings ; reference to choice of where to build ;	<b>3</b>
1(a)(iii)	idea that on/near plate boundary/where plates meet ; Indian plate moving towards Eurasian/plates move towards each other/reference convergent/destructive ; reference subduction ;	<b>3</b>
1(b)	<i>any 2 of:</i> hot rocks for heating/cooking ; geothermal energy ; precious stones ; fertile soil/reference nutrients ; income from tourism ;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(a)(i)	A C B ;; all 3 correct [2], 1 or 2 correct [1]	<b>2</b>
2(a)(ii)	<i>any 2 of:</i> timber (implied) ; settlements e.g. houses, schools , parks, hospitals, dams, hotels , mines, factories ; roads, rails, airports ;	<b>2</b>
2(a)(iii)	soil exposed to elements ; increased loss of water from soil (due to evaporation) ; dries soil ; reduced rainfall ; ref increased wind erosion ;  reduced interception ; increases runoff ; which washes soil away ; without roots soil is subject to erosion ; so easier to wash away as not bound by roots ;  so very few plants can now grow ;	<b>4</b>
2(b)	<i>any 2 of:</i> growing trees and crops / grazing animals (for food in same place) ; don't have to cut down ; diversity increased / maintained ; reduces pest problems ; improves soil fertility ;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
3(a)(i)	 <pre> graph TD     Thistle --&gt; aphids     Thistle --&gt; caterpillar     aphids --&gt; ants     caterpillar --&gt; ants </pre> <p>arrows correct ; levels correct ; all links which are present correct ;</p>	<b>3</b>
3(a)(ii)	a food web (NOT chain) ;	<b>1</b>
3(b)(i)	<i>any 3 of:</i> predators / parasites eat / kill / eq, aphids ; thus stopping (rapid) population growth ; pesticides would kill / eq, predators / parasites ; reducing / removing their effect of aphids ;	<b>3</b>
3(b)(ii)	<i>any 2 of:</i> it rises and later falls ; rises up to EITHER 35 days OR 230 aphids per plant ; falls to 100 days or 0 aphids ; some comment on changes in gradient for one mark (e.g. rise speeds up at about 28 days, slowest fall after 80 days) ;	<b>2</b>
3(b)(iii)	20 aphids per plant ;	<b>1</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
4(a)(i)	$1\,400\,000\,000 \times 0.03 = 42\,000\,000 \text{ (km}^3\text{)} ;$	<b>1</b>
4(a)(ii)	$= 42\,000\,000 \times .008 ;$ $336\,000 \text{ (km}^3\text{)} ;$	<b>2</b>
4(a)(iii)	water directed at crop roots ; water not lost by evaporation / draining plant free into soil / collecting on foliage ;	<b>2</b>
4(a)(iv)	added water dissolves salt ; evaporation brings salt rich water to surface ; evaporation leaves salt behind around plants ;	<b>3</b>
4(b)	<i>any 2 of:</i> more people in urban means more economical to treat / supply water ; as houses close together ; more money available / people richer / people have more influence on authorities ;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
5(a)(i)	T (much) less ozone (ORA) ; T (much) more water (vapour) (ORA) ;	<b>2</b>
5(a)(ii)	(blocking of) UV ; any consequence of not blocking UV to life/humans (cancer, cataracts, mutations) ;	<b>2</b>
5(a)(iii)	(troposphere*) ; increase carbon dioxide level ;  (stratosphere* / ozone layer) reduces ozone level ;  *1 mark for both correct	<b>3</b>
5(b)	<i>any 3 of:</i>  NO: people fear nuclear power ; waste storage a problem ; possibility of making weapons ; radiation leaks / accidents ; cancer / mutation ;  YES: nuclear power does not emit NO <sub>x</sub> / SO <sub>2</sub> ; so reduces acid rain ; very safe in modern plants ; (almost) infinite resource ; conserves fossil fuels ; which can be used for other purposes ; points from either list as long as not contradictory	<b>3</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
6(a)	<p><i>any 3 of:</i>            from rocks ;            by weathering ;            freeze thaw, chemical ;            from dead organisms ;            by decomposition ;            texture allows air and water in ;</p>	<b>3</b>
6(b)(i)	<p><b>6–8</b> circled ;</p> <p><i>any 2 of:</i>            all needed minerals at maximum / high ;            nitrogen less available above 8 / below 6 / P low 8–9 / P low below 6 ;            aluminium high below 6 ;</p>	<b>3</b>
6(b)(ii)	<p><i>any 2 of:</i>            acidic soils lead to low growth / yield ;            some minerals less available in acid soil ;            soil organisms affected ;            corrosive ;            aluminium is very available at low pH ;            aluminium is poisonous / toxic ;</p>	<b>2</b>
6(c)	<p><i>any 2 of:</i>            acid rain ;            from burning fossil fuels / other source ;            releases sulphur dioxide / NO<sub>x</sub> ;            which dissolve in water ;            other named relevant process ;</p>	<b>2</b>