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**ENVIRONMENTAL MANAGEMENT**

**5014/11**

Paper 1

**October/November 2017**

MARK SCHEME

Maximum Mark: 120

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**Published**

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This document consists of **12** printed pages.

Question	Answer	Marks
1(a)(i)	stratovolcano;	<b>1</b>
1(a)(ii)	<i>any two from:</i> the volcano has violent eruptions; shattered rocks could be large enough to cause, death / injury / damage; it could be covered with hot ash / ash could start fires; a lava flow could, engulf it / cause fires / death; poisonous / dangerous / hot, gases;	<b>2</b>
1(a)(iii)	<i>any one from:</i> monitoring / prediction; evacuation when eruption is likely; move settlement to a safer location; strengthen roofs / fire-proof roof materials;	<b>1</b>
1(a)(iv)	<i>any three from:</i> they have always lived there / near, family / friends; the volcano is not known to be, active / dangerous; jobs in tourism / income from tourists attracted by the volcano; jobs / income, from minerals in volcanic areas; geothermal energy for, industry / homes; (some) volcanic soils are fertile;	<b>3</b>
1(b)	<i>any three from:</i> plates move towards each other; subduction / one plate sinks beneath the other plate; the denser / oceanic plate, subducts / sinks; melting; magma rises; through crack / line of weakness / fault;	<b>3</b>

Question	Answer	Marks
2(a)(i)	bar correctly plotted at 1.8 million tonnes;	<b>1</b>
2(a)(ii)	3.2;	<b>1</b>
2(a)(iii)	China much greater / about 8.5 million tonnes more;	<b>1</b>
2(b)	<p><i>any three from:</i>  differences in population – the more people, the more waste;  especially in the coastal population;  differences in the use of plastic / more use of other materials;  litter laws / penalties for littering;  attitudes to litter vary;  larger / smaller, number of rivers entering the sea results in, more / less waste;  differences in waste management;  some have financial incentives to, re-use / recycle plastic;  heavy rains in some countries carries plastic waste quickly to the rivers;  some countries landlocked;</p>	<b>3</b>
2(c)	<p><i>any four from:</i>  unsightly beaches (ocean surface);  remains for years / biodegrades very slowly;  fish / birds / turtles / etc., eat particles of it causing, illness / death / harm;  because it floats at the water surface;  because it resembles, their food / small eggs;  plankton can take in small particles of plastic so food chains are affected;  it moves up the food chain;  animals get entangled with plastics;</p>	<b>4</b>

Question	Answer	Marks
3(a)(i)	plot at 60° N and –1 °C with line joining the plots;	<b>1</b>
3(a)(ii)	<i>any two from:</i> large (overall) decrease; Equator 26 °C whereas 70° N minus 10 °C / Equator hot whereas 70° N is very cold / Equator 36 °C higher / 70° N 36 °C lower; (small) increase to 10° N;	<b>2</b>
3(a)(iii)	<i>any two from:</i> sun higher angle at Equator; heating power concentrated on a smaller area; Sun's rays pass through less atmosphere; less, scattering / reflection / absorption, by the atmosphere; more heat reaches the Earth's surface;	<b>2</b>
3(b)(i)	<i>any two from:</i> addition of, greenhouse gases / CO <sub>2</sub> / methane / nitrous oxide / CFCs; CO <sub>2</sub> from burning, fossil fuels / forests; methane from, rice paddies / cattle keeping / landfill / leaking gas pipes;	<b>2</b>
3(b)(ii)	<i>any three from:</i> doubt the theory / science; need industries for their economy; cannot afford the control measures; very expensive alternatives; want equal treatment with developed countries who polluted in the past while developing their economies;	<b>3</b>

Question	Answer	Marks
4(a)(i)	<i>any one from:</i> hartebeest migrations are shorter; hartebeest move more to the east / wildebeest move more to the north-east;	1
4(a)(ii)	200 km;	1
4(a)(iii)	to get water from, the river / Molopo OR better pasture near the river;	1
4(b)(i)	<p>will be unable to hunt; may have difficulty in gathering the same, fruit / berries; change in diet; lack of resources, e.g. for hunting equipment, wood for fires; unused to monetary economy;</p> <p>will be unable to, hunt / gather food; dependent on others for food; may be language difficulties; cultural differences from other people; lack education / lack skills for farming; unable to, work / make a living;</p> <p>contact with new illnesses; have no immunity to the new illnesses; digestive problems from new foods;</p>	4
4(b)(ii)	<i>any three from:</i> the health / well-being, of the animals will be cared for; they will be provided with water in droughts; they will be protected from poachers; sustainable increase in numbers will result; the people will be able to obtain, meat / food, from the animals, they could earn an income by taking part in wildlife tourism, one example of work, e.g. ranger / guide / driver etc.; improved standard of living;	3

Question	Answer	Marks
5(a)(i)	3(%);	1
5(a)(ii)	water, in the rocks / in the ground / in the soil / aquifer;	1
5(a)(iii)	it is, frozen / solid;	1
5(a)(iv)	plotting accurately; correct wetlands shading according to the key; correct lakes shading according to the key;	3
5(a)(v)	<i>any five from:</i> factories / industry, release, (toxic) waste / chemicals / heavy metals; (raw) sewage (from settlements); example of domestic waste, e.g. detergents / trash / plastic; nitrates / phosphates / fertilisers / agricultural run-off; (chemical) pesticides (from agriculture); eutrophication / description of eutrophication; power stations release, warm water / thermal pollution; radioactive waste from nuclear power stations; oil spills; acid rain; run-off from mining;	5
5(b)(i)	<i>any two from:</i> evaporation; surface run-off; transpiration; precipitation; throughflow; groundwater flow; condensation;	2
5(b)(ii)	reservoir;	1
5(b)(iii)	hydro-electric power / hydro-electric / HEP;	1
5(b)(iv)	interception; evaporation; precipitation;	3

Question	Answer	Marks
5(b)(v)	<p><i>any three woodland points with two town points OR any two woodland points with three town points:</i></p> <p><i>woodland:</i>            lack of interception from trees / water falling directly on ground;            more water enters river / increased surface run-off;            no roots to bind the soil;            so less infiltration;            soil erosion increases and raises river bed;            no roots to absorb the water;            so less infiltration;</p> <p><i>town:</i>            more impermeable surfaces / concrete;            so water cannot infiltrate / surface run-off increases;            more storm drains;            water enters river more quickly;</p>	<b>5</b>
5(c)(i)	Bangladesh;	<b>1</b>
5(c)(ii)	Bangladesh;	<b>1</b>
5(c)(iii)	18.5(%)	<b>1</b>
5(c)(iv)	<p><i>any three from:</i>            more homes have access to / can afford, clean / piped water / services / water used does not have to be collected;            more water in homes used for, modern equipment / cleaning;            example such as, washing machines / dishwashers;            water also used in the gardens;            houses have individual facilities for washing;            examples such as, indoor showers / baths;            more water used for flushing toilet as not pit latrines / better sanitation;</p>	<b>3</b>
5(d)(i)	Nigeria / Chad;	<b>1</b>

Question	Answer	Marks
5(d)(ii)	<p><i>any two from:</i> in West Africa; in a line from the coast stretching inland (eastwards); three or more named countries; <b>between</b> Equator and Tropic of Cancer;</p>	2
5(d)(iii)	<p>Niger Mali Burkina Faso Chad ;;</p> <p>4 correct [2 marks] 1, 2 or 3 correct [1 mark]</p>	2
5(e)	<p><i>Level of response marked question:</i> Level 3 [5–6 marks] Answers will be detailed and well-rounded. The reasons given will be developed. The best answers will include appropriate examples of countries / areas in support.</p> <p>Level 2 [3–4 marks] Answers will include ideas and / or reasons that have been developed or explained. They may include a specific example but lack some essential details within the answer.</p> <p>Level 1 [1–2 marks] Answers may include a reason(s) presented in a list with little development. There may be repetition or comments not relevant to the question asked.</p> <p>No response or no creditable response [0].</p> <p><i>Level of response marking indicative content:</i> Some candidates may talk about rainfall reliability, the location of the country and the impact of drought on crops or animals. Others will take this further concentrating on factors such as population density, percentage income / employment from agriculture, access to food and water storage methods, quality of infrastructure and healthcare and the impact of human activity such as desertification and dam building. Many will mention irrigation. In a drought, access to and distribution of aid may be considered, as well as the money available for relief.</p>	6



Question	Answer	Marks
6(a)(i)	rice farming OR shifting cultivation;	1
6(a)(ii)	dairy farming OR cattle ranching;	1
6(a)(iii)	commercial farming is growing crops or rearing / grazing animals for profit / sale; subsistence farming is growing crops or rearing / grazing animals to feed the farmer and their family;	2
6(a)(iv)	intensive / extensive;	1
6(b)(i)	<i>any two from:</i> north (east) India / south (west) of Nepal / between India and Nepal; flows through Bangladesh; east / south east of New Delhi; starts / source, in the Himalayas; flows into the Bay of Bengal;	2
6(b)(ii)	seeds – requirements OR products; harvesting – farming activities;	2
6(b)(iii)	growing crops – main crop is rice / plants seeds / ploughing / transplanting / weeding / fertile soil; subsistence – small profit / fed to family;	2
6(c)(i)	<i>irrigation:</i> irrigation allows crops to be watered during drier season; so rice can be grown all year round / extends the growing season / area;  <i>pesticides:</i> pesticides used to control weeds / pests; so more room for crops / less of crops are destroyed;  <i>high-yielding varieties (HYVs) of seeds:</i> HYVs are introduced which are more resistant to drought / disease; so more of the crop survives; varieties have a shorter growing season; allowing an extra crop to be grown / larger yields;	4

Question	Answer	Marks
6(c)(ii)	<p><i>any three from:</i>            fertilisers washed into rivers;            causes eutrophication;            nitrogen levels increase;            growth of algae increases;            oxygen levels decrease;            death of aquatic life;            toxicity to humans / blue baby syndrome;            too many chemicals in soil causes, plant toxicity / problems with soil fertility;</p>	<b>3</b>
6(d)(i)	<p><i>any three from:</i>            main feeder pipe brings water, controlled by valve;            explanation of the need for a valve;            (smaller) pipes carry water to plants;            water drips from holes close to plants;            plastic sheet surrounds plants to reduce water loss (through evaporation);</p>	<b>3</b>
6(d)(ii)	<p><i>any two from:</i>            (water directed at roots) so less lost to evaporation;            water not wasted on bare ground between crops;            fewer weeds grow in this area;            more water efficient method / water can be regulated;            all plants have adequate supplies of water;            reduces leaching of nutrients;</p>	<b>2</b>
6(e)(i)	<p>it increased;            from 0.35 to 2.80 million tonnes / by 2.45 million tonnes;</p>	<b>2</b>
6(e)(ii)	<p>1960–1965;</p>	<b>1</b>
6(e)(iii)	<p>correct plotting;            line drawn;</p>	<b>2</b>
6(e)(iv)	<p>31 <u>million tonnes</u>;</p>	<b>1</b>

Question	Answer	Marks
6(e)(v)	<i>any three from:</i> more fertilisers and pesticides needed for HYVs; impact on the environment / extra irrigation caused salinisation; some farmers could not afford, new seeds / equipment (became relatively poorer); farmers had to borrow money / debt increased; rural unemployment / increased rural to urban migration; HYVs not as palatable to eat;	<b>3</b>
6(f)(i)	an energy source that will not run out / can be used over and over again / will always exist;	<b>1</b>
6(f)(ii)	10(%)	<b>1</b>

Question	Answer	Marks
6(f)(iii)	<p><i>Level of response marked question:</i></p> <p><b>Level 3 [5–6 marks]</b> Developed ideas used to describe both viewpoints. Ideas will be developed and expressed in a logical order. It is expected that ideas are linked to specific example(s).</p> <p><b>Level 2 [3–4 marks]</b> Simple ideas presented to support both viewpoints, or a one-sided response that contains more developed concepts. The response may lack structure or some detail.</p> <p><b>Level 1 [1–2 marks]</b> Simple ideas used to describe one viewpoint or form a simple list. Ideas lack detail or development and typically present only one viewpoint. Response may contain irrelevant material or repetition.</p> <p>No response or no creditable response [0].</p> <p><i>Level of response marking indicative content:</i></p> <p>Candidates may start by describing what biomass is or providing examples of biomass.</p> <p>For people in favour, candidates may cover the fact that biomass is renewable (if replanted), it can be stored, and that it uses farm surpluses. Some candidates may say it produces less carbon emissions than fossil fuels and extends the life of fossil fuels.</p> <p>For people not in favour, candidates may cover concerns over intensive methods to produce crops, the cost compared to fossil fuels, the need for capital investment to establish plants, loss of land to grow food crops and deforestation to grow energy crops. They may also say it produces more carbon dioxide than other renewable energy sources.</p>	<b>6</b>