Question	Answer	Marks
2(a)(i)	bar correctly plotted at 1.8 million tonnes;	1
2(a)(ii)	3.2;	1
2(a)(iii)	China much greater / about 8.5 million tonnes more;	1
2(b)	*any three from:* 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;	3
2(c)	*any four from:* 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;	4

Question	Answer	Marks
2(a)(i)	North America is mainly without malaria whereas most of South America has it / less area with malaria in North America / more area in South America with malaria;	1
2(a)(ii)	Chile / Uruguay; Venezuela;	2
2(b)	*any three from:* differences in the ability to afford to spend on, remedial measures / drugs / insecticides / nets; differences in availability of the remedial measures / example of; differences in organisational ability; differences in education about how to solve the problem; differences in the availability of, health care / hospitals / doctors / nurses; differences in the, amount of suitable land area / area with a suitable climate for mosquitoes to breed / measures to eliminate breeding areas; differences in aid received from foreign countries;	3
2(c)	*any four from:* all people need water; deaths; long lasting illness; debilitating illness / causes weakness; reduces ability to work; reduces (personal) incomes; reduces economy of, region / country; reduces, cost / need of medical care;	4

Question	Answer	Marks
6(a)(i)	PCBs **and** flame retardants;	1
6(a)(ii)	accumulation of toxins within the body of an animal; when predator in the food chain feeds on prey the toxin is amplified;	2
6(a)(iii)	*any two from:* from, factories / domestic / agriculture; washed into oceans via, rivers / groundwater / drains; from airborne toxins washed out of atmosphere by rain; from, ships / oil rigs;	2
6(b)(i)	Peru (current);	1
6(b)(ii)	*any three from:* circular motion in, North Atlantic / South Atlantic; circulate clockwise (N); anticlockwise (S); further details such as name and direction of currents; Equatorial currents run East-West / parallel to Equator; warm currents flow towards poles; cold currents flow toward Equator;	3
6(b)(iii)	*any two from:* via Somali current; N. Equatorial current; and Agulhas current; from ships transporting oil from Middle East;	2
6(b)(iv)	*any two from:* lowers temperature; low rainfall; coastal fog / mist;	2
6(c)(i)	10 (m);	1

Question	Answer	Marks
6(c)(ii)	*any three from:* water flows (through turbines / floodgates), into lagoon / from sea (after low tide); water flows (through turbines / floodgates), from lagoon / into sea (after high tide); turns the turbines; which turn generators;	3
6(c)(iii)	tides / water always present; can be used over and over again / tides always move;	2
6(c)(iv)	155 000 (homes);	1
6(c)(v)	*any three from:* rivers carry silt; which will fill the lagoon; and clog turbines; reducing power generated; require lots of dredging; shorten life of scheme; would stop boats moving, up / down stream; impact on fish, movement / breeding; flooding of lower parts of river valleys;	3
6(c)(vi)	*any four from:* fish may get killed in turbines; species trapped in lagoon; leading to inbreeding; damage to habitats during construction; loss of habitats; changes to currents / tides, may damage habitats; possible erosion of beaches; food chain disrupted; specific pollution during construction – qualified;	4
6(d)(i)	both plotted points and line correct;	1

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Question	Answer	Marks
6(d)(ii)	*any three from:* increased 1960 to 1968; from 1.1 to 1.9 (million tonnes); decreased until 1977; to 0.45 (million tonnes); up and down (a little) until 1990; decreased to 0.03 (million tonnes) by 1994 / 5;	3
6(d)(iii)	*any one from:* overfishing; fish stocks so depleted they cannot recover;	1
6(d)(iv)	the interaction of; living organisms (biotic) in conjunction with the physical environment (abiotic) components;	2

Question	Answer	Marks
6(a)(i)	74.1;	1
6(a)(ii)	Zimbabwe; Angola; Malawi;	3
6(a)(iii)	*any three from:* dirty water can cause diseases; named example, e.g. cholera / typhoid / dysentery; unable to work; so little / no, food for family; people die; dehydration; clean water is a basic human need;	3
6(b)(i)	600;	1
6(b)(ii)	*any three from:* Asia higher consumption than North America; both increased; (idea of rate) Asia more (rapidly) than North America; relevant comparable figures, e.g. in 1970 North America 550 billion m^3 per year whereas Asia 1500 billion m^3 per year;	3
6(b)(iii)	57% (*circled*);	1
6(b)(iv)	240 ;; (*if answer incorrect allow one mark for,* 300 divided by 1.25 [1]);	2
6(b)(v)	*any three from:* increasing population (means greater demand for water); increasing wealth / more water using appliances (domestic); industry expands and uses more water; increased, irrigation / agricultural use;	3

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Question	Answer	Marks
6(c)	*any four from:* waste from factories or industrial activities; enters water courses; waste enters into ground water; untreated sewage released into, water courses / sea; oil / petrol / rubber, from vehicles enters drains and then into, water course / sea; human / domestic, rubbish washed or dumped into water courses; in floods variety of pollutants washed into, water courses / sea; lack of waste management; acid rain changes the pH of, rivers / lakes;	4
6(d)	*Level of response marked question:* Level 3 [5–6 marks] For this level; answers must look at both topics in detail and reach a conclusion. Answers will be balanced and will include examples. Level 2 [3–4 marks] Answers may look at both topics, but with only limited detail. More likely they will be one–sided. Level 1 [1–2 marks] Answer may well be a list or descriptive rather than an explanation or may provide a basic explanation of one or two points, often completely one–sided. No response or no creditable response [0]. *Level of response indicative content:* This is a very wide question which can be answered in a variety of ways; mark on quality and depth of discussion. There is no one 'correct' answer. Even the best answers will not cover all aspects. Some answers will simply agree and then try to justify, often ignoring the enhanced greenhouse effect. The best answers will look at the impacts of water pollution and the enhanced greenhouse effect, consider the solutions to these issues and reach a conclusion based on evidence. For water pollution expect oil spills, eutrophication, and other localised events. For the enhanced greenhouse effect expect ice melt, sea level rise and inundation plus changes to rainfall patterns and habitats. Some candidates may discuss the fact that these are international issues both requiring international agreements and discuss the fact that both are difficult to solve completely or quickly.	6

Question	Answer	Marks
2(a)	along west coast / Chile / Peru; south / south east / east Argentina;	2
2(b)	*any two from:* high latitude / long periods of cold weather / low temperature; low population; water frozen / low evaporation / less risk of drought; plentiful, rainfall / precipitation / snow;	2
2(c)	*any two from:* large / dense, population; in areas with low rainfall; crops need much irrigation / agricultural use; high water use industries; example of an extravagant use, e.g. swimming pool / car washing;	2
2(d)	*any two from:* drought resistant crops; irrigation from, aquifers / wells / rivers / reservoirs / water tanks; building, dams / wells; water conservation, e.g. rainwater harvesting; efficient irrigation techniques, e.g. trickle drip irrigation; growing crops outside of drought season;	2

Question	Answer	Marks
7(a)	number of people killed: 4 ; number of households affected: 5520 ; area of crops damaged: 1075 **AND** hectares ;	3
7(b)	*any three from:* lack of clean water; lack of sanitation; lack of shelter / homeless; reduced access to, medical care / emergency supplies; loss of crops / starvation / malnutrition; stagnant water; spread of disease; named water-related disease; some injured may die; some people still missing;	3

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Question	Answer	Marks
7(c)	*any three from:* use of, accurate weather forecasting / hydrographs / early warning systems; investment in, dams / walls to rivers / dredge rivers / widen rivers / straighten rivers; provision of emergency shelters; practice emergency procedures; availability of, medical support / rescue teams / equipment; restrict building in flood-prone areas; afforestation; building modifications;	3

3(a)(i)	*any two from:* rubbish / domestic waste; (untreated) sewage; the child is standing in the water; (toxic) chemicals (from, industry / agriculture); water-related diseases / bacteria / named example;	**2**
3(a)(ii)	*any two from:* improvement to sanitation to separate from water source; piped water; digging wells / storage reservoirs; bottled water / water tankers; sewage treatment system; chlorination / boiling / water filter; water treatment plant;	**2**
3(b)	13(.3) ;; (*if answer incorrect allow one mark for,* 82.6–72.9 or 9.7 [1]);	**2**

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Question	Answer	Marks
3(c)	*any two from:* lack of money / lack of infrastructure / lack of technology or skills; water is geographically inaccessible / water is ice / country is land-locked; lack of rain; lack of fresh water sources; climate change / drought; water stores have been contaminated; natural disaster; conflict; (too) large population;	**2**

Question	Answer	Marks
4(a)	*any three from:* reduced areas in 2016; reduced in southern and northern areas; named area / continent, e.g. southern part of South America; northern Africa; central Asia;	3
4(b)(i)	*any three from:* use of antimalarial drugs; mosquito nets; control of vector / mosquito with pesticides; removal of stagnant water; application of oil to water sources;	3

Question	Answer	Marks
4(b)(ii)	356 000;	1
4(b)(iii)	*any three from:* remoteness of population; lack of money for control methods; lack of health care; lack of awareness amongst population; resistance to antimalarial drugs; areas with lots of stagnant water present;	3

Question	Answer	Marks
5(a)(i)	*any two from:* Africa has (ora): more LEDCs / less money, to invest in safe water; fewer safe water sources; fewer water-treatment facilities, e.g. chlorination / desalination ; less water-delivery infrastructure, e.g. pipes, bottling; lower levels of sanitation; more areas of water shortage; more, water pollution / contamination / water-borne diseases; more conflict (restricting access to water);	2
5(a)(ii)	*any three from:* aquifers; rivers; lakes; (natural) springs; reservoirs / dams; desalination / treatment / filtration, plants; (stand)pipes; rain(water) (harvesting);	3
5(b)(i)	2011;	1
5(b)(ii)	Africa;	1

Question	Answer	Marks
3(a)	*any three from:* drink safe water; cholera is a water-borne disease; wash your hands with soap; spread by touch / contaminate food or people / prevent transmission / eq; have a vaccination; prevent infection / reduces spread / allows humans to fight the infection / lead to eradication / provides immunity; keep cooking areas clean; prevents (cross) contamination;	**3**
3(b)	*any two from:* LEDC / ora: less effective sanitation; fewer sources of clean water; less access to, medical care / vaccinations; different economic priorities; less awareness; larger number of informal settlements; AVP;	**2**

Question	Answer	Marks
4(a)	*any two from:* large population and limited land; economic; employment; safer; better access to medical facilities / education; better infrastructure; AVP;	**2**

Question	Answer	Marks
9(a)	*any three from:* more demand for drinking; food therefore more agriculture using water; more, productivity / industry, therefore more water used; more people using, showers / pools, therefore more water used; less availability due to more industry therefore more pollution; more waste (sewage) therefore more pollution; increased competition;	**3**
9(b)(i)	(location) 1;	**1**
9(b)(ii)	9.2;	**1**
9(b)(iii)	location 3 (no mark) has highest level of N / P / K; fertiliser contains N / P / K;	**2**
9(c)	Level 3 [5–6 marks] **A coherent response is given that develops and supports the candidate's conclusion using relevant details and examples.** Indicative content and subject-specific vocabulary are generally used precisely and accurately. Good responses are likely to present a balanced evaluation of the statement. Level 2 [3–4 marks] **Development and support of the conclusion is evident, though the response may lack some coherence and/or detail.** Irrelevant detail may be present. Indicative content and subject-specific vocabulary are used but may lack some precision and / or accuracy. Responses contain evaluation of the statement, but this may not be balanced. Level 1 [1–2 marks] **The response may be limited in development and/or support.** Contradictions and / or irrelevant detail may be present. Indicative content and subject-specific vocabulary may be limited or absent. Responses may lack structure or be in the form of a list. Evaluation may be limited or absent.	**6**

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Question	Answer	Marks
9(c)	No response or no creditable response [0 marks] *indicative content for:* Building a dam is the best way to provide a constant water supply. *agree*: can produce HEP resulting in cheap electricity prevents flooding as river is controlled secure water supply / reduces water insecurity provides habitat for fish / fish for food provides recreation (swimming / sailing / canoeing) provides irrigation provides jobs (building / maintenance) income for local people (fish / tourism / recreation) tourist attraction *disagree:* very expensive to build massive engineering undertaking requires dislocation of people flooding of property / farmland geology not always suitable susceptible to earthquake / land movement susceptible to terrorism damage to environment / habitats disruption of fish migration requires / cost of maintenance silt up reduces availability of water downstream causes cross border conflict alternative / cheaper / less disruptive ways exist	

Question	Answer	Marks
6(a)(i)	ref to, equator / tropics, e.g. mostly between the tropics; *plus any two further details:* South / (&) Central America; most of Africa; (South) Asia / Middle East;	3
6(a)(ii)	cooler climates / better control methods / AVP;	1
6(b)(i)	*any four from:* infected person bitten; by female (anopheles) mosquito; parasite / plasmodium, transmitted to mosquito; mosquito acts as a vector; mosquito bites new person; (parasite / plasmodium) transmitted to new person;	4
6(b)(ii)	*any two from:* use mosquito nets; drain swamps / breeding grounds; cover water sources; introduce fish into lakes to eat mosquito larvae; introduce sterile male mosquitoes into population; use antimalarial drugs; education of population (regarding vector control);	2

Question	Answer	Marks
6(a)	74%;	1
6(b)	*Three from:* lack of infrastructure / pipes; remote locations / rural areas; lack of rainfall / water stores; insufficient money; water is contaminated / polluted / water-borne disease; population increase; conflict;	3
6(c) (i)	boiling; chlorination;	2
6(c) (ii)	*Three from:* bacterial disease / Vibrio cholerae; poor sanitation / e.g. open toilets; poor personal hygiene; faeces / waste (from infected person); through run off (to water source / ground water);	3
6(d)	*Two from:* frozen; remote location/ not near population; too deep; geology;	2