

WATER 1

MARK SCHEME

Q1.

Question	Answers	Extra information	Mark
(a)(i)	limestone dissolves	accept rock dissolves allow references to the process e.g. hydrogen carbonate ion formation	1
(ii)	calcium carbonate	accept (lime) scale ignore limestone do not accept scum	1
(iii)	temporary		1
(b)(i)	12	correct answer with or without working = 2 marks evidence of $(13+11)/2$ gains 1 mark allow 10 for 1 mark	2
(ii)	spring water		1
	most soap (solution) needed	depends on first marking point comparison required allow highest number of drops	1
Total			7

Q2.

Question	Answers	Extra information	Mark
	Argument for : any one from: <ul style="list-style-type: none"> • prevents disease • kills microbes /microorganisms / bacteria /pathogens • only small amounts needed 	ignore sterilise / disinfect allow prevents illness ignore removes	1
	Argument against : any one from:	ignore cost / taste / corrosive ignore harmful or causes health	1

	<ul style="list-style-type: none"> • toxic / poisonous • no consumer choice 	problems or specific illnesses / diseases allow unethical	
Total			2

Q3.

Question	Answers	Extra information	Mark
(a)	filtered: removes insoluble / solid	Ignore named substances / minerals do not accept ions	1
	chlorine: kills microorganisms/ microbes / bacteria / disinfects (water)	allow kills germs / pathogens or sterilises allow chlorine is a disinfectant ignore cleans water or removes impurities / bacteria	1
(b)(i)	advantages of portable: any two from : <ul style="list-style-type: none"> • costs less • little training needed • water can be tested within 10 seconds / immediately / quicker • can be used anywhere disadvantage of portable less precise / sensitive	accept converse throughout	2
		allow only detect down to 0.1 mg ignore less accurate	1
(ii)	(PIWE) is unbiased Or Company may be biased	it / they = PIWE allow honest / trusted / respected / reliable ignore professional / scientific / skilled allow company trying to sell products	1
Total			6

Q4.

Question	Answers	Extra information	Mark
(a)	contact with rocks		1
	(ions) dissolve / soluble / react	allow water is a solvent ignore 'picks up' / 'gets into' / absorbed	1
(b)	more calcium / Ca ²⁺ and / or	accept 'a lot' of calcium / magnesium	1

	magnesium / Mg ²⁺ (ions in Crete water)	allow incorrectly charged Ca and Mg ions accept correct comparison using numbers from the table do not accept mention of other ions	
(c)	two from: • scum / calcium stearate / magnesium stearate • (scum) more soap used • scale / limescale / calcium carbonate / magnesium carbonate • (scale) less efficient heating systems / kettles / appliances • use of a water softener eg sodium carbonate / ionexchange	if an effect and clarification are given, the clarification must be correct to gain both marks accept does not lather (easily) ignore costs more unqualified ignore fur ignore costs more unqualified ignore blocks pipes unqualified accept salt in dishwashers	2
(d)	any one from: • sodium carbonate / washing soda • ion-exchange • distillation	ignore filter / filtration allow soap accept de-ionised ignore boiling / heating / evaporation	1
Total			6

Q5.

Question	Answers	Extra information	Mark
(a)(i)	calcium		1
(ii)	calcium		1
(b)	(shake with) soap (solution) scum	ignore detergent accept less lather with hard water allow solid / precipitate ignore bubbles incorrect test = 0 marks for question	1 1

		correct results with no test score 1	
(c)	any two from: <ul style="list-style-type: none"> • good for health / healthier • stronger bones / teeth • less heart disease 	ignore vitamins	2
Total			6

Q6.

Question	Answers	Extra information	Mark
(a)	sterilise / disinfect (water) or kill bacteria / micro-organisms / microbes / germs / pathogens	ignore removes bacteria / impurities / disease ignore cleans the water / makes (water) safe allow destroy bacteria or gets rid of bacteria	1
(b)	any two from: <ul style="list-style-type: none"> • chlorine is toxic / poisonous • so (too much) will be dangerous / harmful / kill people / cause illness / health problems • cause breathing difficulties or cause (more) allergic reactions / skin or eye irritation • too little will not kill bacteria 	ignore reference to safe / unsafe allow causes damage allow bacteria still there	2
(c)	cheap / easy / quick to use (process)	accept prevents typhoid / cholera ignore reference to specialists or equipment	1
(d)(i)	fair / more ideas / views / opinions or less chance of bias or more democratic	allow idea of different points of view / balanced view allow avoids undue influence owtte	1
(ii)	(more likely) to have support / influence / convince people	ignore well respected allow ideas about trust e.g. people will have more confidence in their views / more likely to be believed allow ideas about expertise e.g. more likely to know what they are talking about / have done experiments / tests	1

