



Rewarding Learning

**General Certificate of Secondary Education
2010–2011**

Science: Single Award (Modular)
Electricity, Waves and Communication

Module 5

Higher Tier

[GSC52]

FRIDAY 20 MAY 2011, MORNING

**MARK
SCHEME**

			AVAILABLE MARKS	
1	(a) (i)	transverse	[1]	9
		(ii) The vibrations are at right angles to the direction of the wave.	[1]	
	(b) (i)	4 cm	[1]	
		(ii) 6 cm	[1]	
	(c) (i)	see –hear [1] appropriate timing [1] large distance [1] formula [1]	} any 3 [3]	
		(ii) accurate: ensure time started when blocks banged/stopwatch increased distances = [1] reliable: repeat/average = [1]	[2]	
2	(a)	4500	[1]	6
	(b)	wind; less electricity produced; amount of land; intermittent/unreliable hydroelectric – lack of sites; cost/flooding	[2]	
	(c) (i)	12500	[1]	
		(ii) less greenhouse gases/carbon dioxide/air pollution less global warming (any 2 = 1 mark each) or less sulphur dioxide/carbon dioxide [1] less acid rain [1]	[2]	
3	(a)	longer wire = higher resistance or opposite = [1] higher resistance = less current or opposite = [1]	[2]	5
	(b)	thickness/material	[1]	
	(c)	dimmer switch/volume control/cooker (ring switch)/thermostats/toaster	[1]	
	(d)	ohm/symbol	[1]	
4	(a)	very <i>high</i> frequency/too <i>high</i> for humans = [1] above 20 kHz = [1]	[2]	5
	(b) (i)	cancer/tumour	[1]	
		(ii) more exposure	[1]	
	(c)	highest frequency	[1]	

		AVAILABLE MARKS
5	(a) $230 \times 0.7 = 161 = [1]$ changing W to kW = [1] changing mins to hours = [1] $0.161 \times 0.75 \times 18 = [3]$ 2 pence/2.2p/2.17p	[4]
	(b) (i) analogue varies continuously = [1] digital = on/off = [1]	[2]
	(ii) less interference; easily processed by computers clearer signals	[2]
	(c) microwaves absorbed [1]/by water molecules [1] water molecules vibrate [1]/faster [1] friction [1] (any 3 = [1] each)	[3]
6	(a) all correct = [2] 2/1 correct = [1]	[2]
	(b) concave lens = [1] divergence at lens = [1] convergence at cornea/lens and focus on retina = [1]	[3]
	(c) (i) uneven curve on cornea = [1] focus sharper <i>in some directions</i> = [1]	[2]
	(ii) series of crossed lines or diagram = [1] some directions more blurry = [1]	[2]
	Total	45
		11
	9	