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]	
		(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]	9
2	(a)		4500 [1]	
	(b)		wind; less electricity produced; amount of land; intermittent/unreliable hydroelectric – lack of sites; cost/flooding [2]	
	(c)	(i)	12 500 [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]	6
3	(a)		longer wire = higher resistance or opposite = [1] higher resistance = less current or opposite = [1] [2]	
	(b)		thickness/material [1]	
	(c)		dimmer switch/volume control/cooker (ring switch)/thermostats/ toaster [1]	
	(d)		ohm/symbol [1]	5
4	(a)		very *high* frequency/too *high* for humans = [1] above 20 kHz = [1] [2]	
	(b)	(i)	cancer/tumour [1]	
		(ii)	more exposure [1]	
	(c)		highest frequency [1]	5

			AVAILABLE MARKS
5	**(a)**	230 × 0.7 = 161 = [1] changing W to kW = [1] changing mins to hours = [1] 0.161 × 0.75 x 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]	11
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 *in some directions* = [1] [2]	
	(ii)	series of crossed lines or diagram = [1] some directions more blurry = [1] [2]	9
		Total	**45**