



Rewarding Learning

**General Certificate of Secondary Education
2011–2012**

Science: Single Award (Modular)

Electricity, Waves and Communication
Module 5

Higher Tier

[GSC52]

**WEDNESDAY 29 FEBRUARY 2012
9.30 am–10.15 am**

**MARK
SCHEME**

			AVAILABLE MARKS	
1	(a) (i)	timing how long the bulb stays lit/or implied	[1]	9
	(ii)	all the electricity is used up/or implied	[1]	
	(iii)	charged for 12 hours/same time same bulb/same battery/same wind turbine (any 2 = 1 mark each)	[2]	
	(iv)	results will be inaccurate	[1]	
	(b) (i)	solar/hydroelectric/wave/geothermal/tidal	[1]	
2	(ii)	fossil fuels non-renewable/will run out [1] less carbon dioxide/less air pollution/less acid rain less greenhouse gases [1] less greenhouse effect/less global warming [1]	[3]	6
	(a)	light travels faster than sound	[1]	
	(b)	sound bounces off/reflects [1] hard surfaces/brick wall [1]	[2]	
(c)	50/0.3 [1] 50/0.15 or 100/0.3 [2] 333 [3]	[3]	8	
3	(a) (i)	prevents too much current/electricity flowing [1] melting and breaking/gap in circuit [1]		[2]
	(ii)	plastic cover/earth wire [1] plastic is an insulator/ carries current to ground/not through user (appropriate explanation) [1]		[2]
(b) (i)	earth wire	[1]		
(ii)	no metal parts exposed [1] covered with plastic [1] plastic cover is an insulator [1]	[2]		
(c)	don't need to be replaced/react faster/more sensitive	[1]		

			AVAILABLE MARKS
4	(a) (i)	4×2 [1]	
		8v	[2]
	(ii)	16v/c.m if double part (i)	[1]
	(iii)	16v/c.m if same as part (ii)	[1]
	(b)	If one light goes out, the others stay lit [1] Driver still has light/can see where going [1]	[2]
	(c) (i)	arrow from positive to negative/anti clockwise	[1]
	(ii)	actual is flow of electrons [1] electrons have -ve charge [1]	[2]
			9
5	(a) (i)	only 1 set of measurements [1] unrelated distances [1] unfair comparison of laptop + mast [1] (any 2 = 1 mark each)	[2]
	(ii)	tumour/cancer	[1]
	(b) (i)	all transverse waves/travel at same speed/ travel at speed of light/can travel through a vacuum	[1]
	(ii)	higher frequency [1] carry more energy/more penetrating [1]	[2]
			6
6	(a) (i)	waves absorbed by water molecules [1] molecules vibrate [1] faster [1] more friction produces heat [1] (any three from above)	[3]
	(ii)	grill cooks from outside in/microwave cooks from inside out	[1]
	(b)	900W – 0.9Kw [1] 30 mins – 0.5hr [1] $\times 7 \times 21$ [1] (any 2 = 1 mark each) 66p [3]	[3]
			7
		Total	45