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]	
		(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]	
		(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]	9
2	(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]	6
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]	8

					AVAILABLE MARKS
4	(a)	(i)	4 × 2 [1] 8 v	[2]	
		(ii)	16 v/c.m if double part (i)	[1]	
		(iii)	16 v/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)		900 W – 0.9 Kw [1] 30 mins – 0.5 hr [1] × 7 × 21 [1] (*any* 2 = 1 mark each) 66p [3]	[3]	7
				Total	**45**