New Specification

Rewarding Learning

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 3 (Physics)

Foundation Tier

[GSS31]

WEDNESDAY 29 FEBRUARY, 2012
9.30 am–10.30 am

MARK SCHEME

					AVAILABLE MARKS
1	(a)	(i)	Mars	[1]	
		(ii)	asteroids	[1]	
	(b)		heliocentric – Sun at the centre [1] geocentric – Earth at the centre [1]	[2]	
	(c)	(i)	increases/gets longer	[1]	
		(ii)	Uranus; furthest from Sun	[2]	7
2	(a)	(i)	4/town	[1]	
		(ii)	1/power station	[1]	
	(b)	(i)	electrical	[1]	
		(ii)	heat	[1]	
	(c)	(i)	10 am–4 pm	[1]	
		(ii)	1500 watts	[1]	
		(iii)	all in bed	[1]	7
3	(a)	(i)	uses less electrical energy/lasts longer/lower running cost/ more efficient/wastes less energy] do not allow cheaper *(any 2 = 1 mark each)*	[2]	
		(ii)	cheaper to buy	[1]	
	(b)		$\frac{3}{15}$ [1] $0.2(\frac{1}{5})$ [2] 20%	[2]	5
4	(a)	(i)	series	[1]	
		(ii)	parallel	[1]	
	(b)	(i)	the other bulb goes out/ref. to current flow	[1]	
		(ii)	the other bulb stays lit/gets brighter/ref. to current flow do not allow dimmer	[1]	
	(c)	(i)	2	[1]	
		(ii)	$\frac{8}{2}$ [1] 4 [2] e.c.f from [1]	[2]	7

				AVAILABLE MARKS
5	(a)	1. steady speed	[1]	
		2. stopped/stationary	[1]	
	(b)	gets faster	[1]	
	(c)	$\frac{120}{40}$ [1] 3 m/s [2]	[2]	
	(d)	crumple zones/air bags/seat belts/side impact bars *(any 2 = 1 mark each)*	[2]	
	(e)	(i) slows *cars* down [1] less *serious* injuries/accidents [1]	[2]	
		(ii) slows emergency response time/uses more fuel accelerating and decelerating between them	[1]	10
6	(a)	(i) 2.5 m	[1]	
		(ii) 8 m	[1]	
	(b)	2 Hz	[1]	
	(c)	(i) vibrations at right angles/up and down [1] to wave travel [1]	[2]	
		(ii) any electromagnetic wave	[1]	6
7	(a)	braking	[1]	
	(b)	(i) 3 points correct [1] correct line [1] ± $\frac{1}{2}$ square	[2]	
		(ii) as speed increases, thinking distance increases	[1]	
		(iii) no change	[1]	
	(c)	(i) the shorter distance the stick falls [1] the quicker her reactions are [1]	[2]	
		(ii) repeat/average [1] 0 cm on ruler to be held just above hand [1]/implied	[2]	9

AVAILABLE MARKS

8 **(a)** Indicative Content

- Amount of beta going through will change with thickness of aluminium
- Thicker aluminium the less beta radiation detected (or vice versa)
- Alpha would be stopped by aluminium/paper/air
- Gamma would go straight through aluminium/stopped by lead
- Beta stopped by aluminium

Band	Response	Mark
A	Candidates use 4 or 5 of the above points in a logical sequence to explain fully why beta is best. They use good spelling, punctuation and grammar and the form and style are of a high standard.	5–6
B	Candidates use 3 of the above in a logical sequence to partially explain why beta is best. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	3–4
C	Candidates explain why beta is best using some 1 or 2 of the above points. However these are not presented in a logical sequence. They use limited spelling, punctuation and grammar.	1–2
D	Response not worthy of credit	0

[6]

(b) cobalt 60 [1]

Gamma; has most penetrating power/kills bacteria

Half-life is longest/doesn't need to be replaced often [1] [2]

9

Total **60**