Rewarding Learning

General Certificate of Secondary Education
2012

Science: Double Award (Modular)

Paper 3
Foundation Tier

[G8203]

FRIDAY 15 JUNE, AFTERNOON

MARK SCHEME

					AVAILABLE MARKS
1	**(a)**	**(i)**	Chemical	[1]	
		(ii)	Elastic/Strain	[1]	
		(iii)	Kinetic/Wind	[1]	
	(b)	**(i)**	Non-renewable [1] Renewable [1] Non-renewable [1]	[3]	
		(ii)	Gas	[1]	
	(c)	**(i)**	Car B/racing car	[1]	
		(ii)	1. Wider base (dependent marking from **(i)**) 2. Lower c of g	[1] [1]	
	(d)	**(i)**	Venus, Mars, Jupiter, Neptune [$\frac{1}{2}$] each (round up)	[2]	
		(ii)	Sun	[1]	
		(iii)	A collection of stars	[1]	
		(iv)	Milky Way	[1]	
	(e)	**(i)**	Universe has a starting point	[1]	
		(ii)	Steady State **or** String	[1]	
		(iii)	Lack of sufficient fuel **or** food **or** time required (any **two**)	[2]	
		(iv)	Fusion	[1]	20

				AVAILABLE MARKS
2	**(a)**	**(i)** Electrons move [1] due to friction/rubbing [1]	[2]	
		Quality of written communication	[1]	
		(ii) Charges are similar	[1]	
		(iii) Similar charges repel	[1]	
	(b)	10 [1] 40 [1] 30 [1]	[3]	
	(c)	**(i)** Electric energy = 3 (kWh)	[1]	
		(ii) Cost = 39 (p) Allow e.c.f. from **(i)**	[1]	
	(d)	Ammeter [1] and voltmeter [1] correctly labelled	[2]	
	(e)	**(i)** 5 correct points ($\pm \frac{1}{2}$ square)	[1]	
		(ii) Best fit straight line through (0, 0) ($\pm \frac{1}{2}$ square)	[1]	
		(iii) Current = 0.06 (A)	[1]	
		(iv) R = V/I [1] **or** V = IR $R = \frac{V}{C}$ for Partial Credit = [0] = 2.4/0.06 [1] = 40 Ω [1] Allow e.c.f. from **(iii)**	[3]	
	(f)	Curve with positive increasing gradient [1] through (0,0) [1]	[2]	20

				AVAILABLE MARKS
3	(a)	(i)	Energy [1]	
		(ii)	←→ [1]	
		(iii)	3 [1]	
		(iv)	3 Allow e.c.f. from **(iii)** [1]	
		(v)	0.5 (m) [1]	
		(vi)	v (or speed) = f × λ [1] = 3 × 0.5 [1] = 1.5 (m/s) [1] Allow e.c.f. from **(iv)** and **(v)** [3]	
		(vii)	Sound **or** Ultrasound [1]	
	(b)	(i)	Vibrations are at right angles/perpendicular [1]	
		(ii)	Light **or** (any named member of e.m.s.) **or** water waves [1]	
	(c)	(i)	The gong vibrates [1]	
		(ii)	It decreases [1]	
		(iii)	Sound waves require a medium **or** Sound waves do not travel through a vacuum [1]	
		(iv)	Vibrations/sound will travel through the glass [1]	
	(d)	(i)	20 (Hz) [1]	
		(ii)	20 000 (Hz) **or** 20 **k**Hz [1]	
		(iii)	It decreases [1]	
		(iv)	Damage to eardrums [1]	
		(v)	Use ear protection/ear plugs/defenders [1]	20

					AVAILABLE MARKS
4	(a)	(i)			

Object	Luminous	Non-Luminous
Star	✓	
Moon		✓
Planet		✓
White paper		✓

[1] each [4]

(ii) A [1]

(b) **(i)** Normal, correctly drawn [1]

(ii) 50° [1]

(c) **(i)** Undeviated ray at first interface [1]
refracted [1]
correctly [1] [3]

(ii) Slows down [1]

(d) **(i)** Dispersion [1]

(ii) Violet, Indigo, Blue, Green, Yellow, Orange, Red [2]
Deduct [1] if correct but reversed

(iii) Spectrum [1]

(e) **(i)** Gamma **or** γ [1]

(ii) Infrared **or** IR [1]

(iii) Gamma **or** γ [1]

(iv) Ultraviolet **or** UV [1]

(v) Radio waves [1] 20

Total **80**