



Rewarding Learning

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

Science: Double Award (Modular)

Forces and Energy

End of Module Test

C

Foundation Tier

[GDC01]

MONDAY 14 NOVEMBER 2011

1.30 pm–2.15 pm

**MARK
SCHEME**

			AVAILABLE MARKS								
1	(a) (i) Chemical [1]										
	(ii) Strain/Elastic [1]										
	(iii) Sound [1]	[3]									
	(b) Potential/GPE [1] and kinetic/movement [1] (either order)	[2]	5								
2	(a) Never runs out/can be replaced in a lifetime/limitless supply	[1]									
	(b)	<table style="display: inline-table; border: none; vertical-align: middle;"> <tr> <td style="padding: 0 10px;">Renewable</td> <td style="padding: 0 10px;">Non-renewable</td> </tr> <tr> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> </table>	Renewable	Non-renewable	✓	✓	✓	✓	✓	✓	[4]
Renewable	Non-renewable										
✓	✓										
✓	✓										
✓	✓										
3	(a) Carbon dioxide/CO ₂	[1]									
	(b) Burning fossil fuels/examples (cars, power stations etc.)	[1]									
	(c) Raised sea water levels/flooding/(polar) ice (caps) melting/changing weather patterns/any response illustrating the change (e.g. hotter weather) References to temp. increasing alone [0] marks	[1]	3								
4	(a) A force [1] which opposes motion [1] dependent marking	[2]									
	(b) (i) Arrow parallel to and up the slope ↖	[1]									
	(ii) Heat/sound	[1]	4								
5	(a) Moment = $F \times d$	[1]									
	= 12×80	[1]									
	= 960	[1]									
	= Ncm	[1]									
	(b) Clockwise not ↻	[1]	5								
6	(i) The tumbler is more stable. (✓)	[1]									
	(ii) Broader/wider base/bigger base area lower c of g [1] dependent marking	[2]	3								

		AVAILABLE MARKS
7	Efficiency = (useful) energy out/energy in or $\frac{EO}{EI}$ = 600/800 = 0.75 (75%) or Eff = $\frac{EO}{EI}$	[1] [1] [1] 3
8	(i) 600 (cm ²) (ii) P = weight/area or $\frac{F}{A}$ or equivalent = 200/600 = 0.33 (N/cm ²) allow e.c.f. or P = $\frac{F}{A}$	[1] [1] [1] [1] 4
9	(a) (i) B [1] (ii) B [1] (b) p = m × v or Mom = mv etc. = 160 × 200 = 320 000 (kg m/s)	[1] [2] [1] [1] [1] 5
10	(a) Extension is (directly) proportional to force up to elastic limit (b) 5 N causes 15 cm ext 1 N causes 3 cm ext (Ext of 6 cm caused by) 2 (N)	[1] [1] [1] [1] [1] 5
11	Conduction [1] Radiation [1] Conduction [1] Convection [1]	[4] 4
12	(a) OP (b) Statements (i) [1] and (iv) [1] are correct (c) Displacement is a vector or displacement has direction (converse reason acceptable)	[1] [2] [1] 4
Total		50