



Rewarding Learning

**General Certificate of Secondary Education
2010–2011**

Science: Double Award (Modular)

Forces and Energy

End of Module Test

C

Foundation Tier

[GDC01]

THURSDAY 11 NOVEMBER 2010, AFTERNOON

**MARK
SCHEME**

			AVAILABLE MARKS
1	(a) Any two from: coal, oil, lignite, turf (or peat)	[2]	5
	(b) Any two from: hydroelectric, tidal, geothermal, wind, waves, biomass, wood	[2]	
	(c) Preserve fossil fuels or will never run out Less polluting or less global warming or reduce carbon footprint	[1]	
2	Av. speed = $\frac{d}{t}$ [1] $= \frac{48}{8}$ [1] $= 6$ [1] (m/s)	[3]	3
3	(a) (i) (Gravitational) potential or GPE	[1]	4
	(ii) Potential or GPE	[1]	
	(iii) Kinetic or movement or KE	[1]	
	(b) Heat or Sound or Kinetic or KE	[1]	
4	(a) Weight/gravity or gravitational Friction	[1] [1]	3
	(b) Equal	[1]	
5	(a) (i) Conduction	[1]	4
	(ii) Convection	[1]	
	(b) atom/molecule	[1]	
	(c) Radiation	[1]	
6	(a) 5 (N) award [1] for suitable working e.g. $W = mg$	[2]	6
	(b) (i) Moment = Force \times dist	[1]	
	$= 5 \times 60$ e.c.f. from (a)	[1]	
	$= 300$ (N cm)	[1]	
	(ii) clockwise	[1]	

			AVAILABLE MARKS
7	$W = F \times d$ [1] $= 80 \times 2$ [1] [1] $= 160$ (J) [1] (Note: 200 cm \rightarrow 2 m is a free-standing mark)	[4]	4
8	Lower c of g/lower com Wider wheel base or wider base or wider base area	[1] [1]	2
9	(i) $E = \frac{\text{energy out}}{\text{energy in}}$ or equiv. or $\frac{EO}{EI}$ $= \frac{3}{75}$ $= 0.04$ or 4% (ii) No unit (iii) Energy wasted, Breaks Principle of Conservation of energy, all output is not sound	[3] [1] [1]	5
10	(a) Friction or centripetal force (b) Momentum = mass \times vel. [1] or $p = mv$ $= 115 \times 6$ [1] $= 690$ [1] kg m/s [1] (or Ns)	[1] [4]	5
11	(a) AB Biggest slope/gradient OR biggest distance in same time interval (b) Speed = grad or $\frac{d}{t}$ [1] $= \frac{60}{30}$ [1] $= 2$ (m/s) [1]	[1] [1] [3]	5
12	(a) $P = \frac{\text{Weight}}{\text{Area}}$ [1] or $\frac{W}{A}$ or $\frac{F}{A}$ $= \frac{900}{450}$ [1] $= 2$ (N/cm ²) [1] (b) on 10 cm by 20 cm side/on smallest side	[3] [1]	4
Total			50