



Rewarding Learning

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

Science: Double Award (Modular)

Forces and Energy
End of Module Test

Foundation Tier

[GDC01]

FRIDAY 20 MAY 2011, AFTERNOON

**MARK
SCHEME**

		AVAILABLE MARKS
1	(a) Electrical [1] to Heat/Thermal [1]	[2]
	(b) Sound [1] to Electrical [1]	[2]
	(c) Sound/Light	[1]
2	(a) (i) Limitless or cannot be used faster than it is made Never run out	[1]
	(ii) Solar/Geothermal/Tidal/Biomass/HEP/wind Any two [1] each	[2]
	(b) Coal, (Natural) gas, Peat/Turf any two	[2]
3	(Average) speed = $\frac{\text{distance}}{\text{time}}$ or equivalent [1]	
	= $\frac{90}{6}$ [1]	
	= 15 [1]	[3]
4	(a) (i) Friction or Air resistance or Drag	[1]
	(ii) "is equal to"	[1]
	(b) Accelerates/(Velocity) increases/faster	[1]
5	Pressure = $\frac{\text{Force}}{\text{Area}}$ or $\frac{F}{A}$ or equivalent [1]	
	= $\frac{300}{0.02}$ [1]	
	= 15000 [1] N/m ² or Pa [1]	[4]
6	(a) (i) Inward arrow	[1]
	(ii) Tension	[1]
	(b) Momentum = $m \times v$ or equivalent [1]	
	= 1.2×8 [1]	
	= 9.6 [1] (kg m/s)	[3]
		5

		AVAILABLE MARKS
7	(a) Air is trapped [1] which is a good insulator [1]	[2]
	(b) (i) Metal	[1]
	(ii) Best conductor of heat	[1]
8	(i) C	[1]
	(ii) All bodies fall at the same rate under gravity	[1]
	(iii) Feather	[1]
9	(a) Efficiency = $\frac{\text{useful output energy}}{\text{input energy}}$ [1]	
	= $\frac{1200}{3000}$ [1]	
	= 0.4 or 40% [1]	[3]
	(b) $\frac{3}{5}$ or 60% or 0.6 [1] allow e.c.f. from (a)	[1]
10	(a) 20 (m)	[1]
	(b) Speed = Gradient = $\frac{\text{distance}}{\text{time}}$ [1]	
	= $\frac{60}{8}$ [1]	
	= 7.5 [1] (m/s)	[3]
11	(a) (i) 6 (mm)	[1]
	(ii) Extension	[1]
	(b) Extended length = 16 [1] (mm) or from graph	
	Load = 4 [1] (N)	[2]

12 (a) Work done = Force \times distance or equivalent [1]

$$= 25000 \times 1.5 \text{ [1]}$$

$$= 37500 \text{ [1] (J)}$$

[3]

(b) Power = $\frac{\text{Work done}}{\text{Time taken}}$ [1]

$$= \frac{42000}{30} \text{ [1]}$$

$$= 1400 \text{ [1] (W)}$$

[3]

Total**AVAILABLE
MARKS**

6

50