Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Double Award (Modular)

Forces and Energy

End of Module Test

Foundation Tier

C

[GDC01]

WEDNESDAY 29 FEBRUARY 2012

9.30 am–10.15 am

MARK SCHEME

			AVAILABLE MARKS
1	**(i)** Strain	[1]	
	(ii) Kinetic or Potential	[1]	
	(iii) Potential	[1]	
	(iv) Heat and sound	[2]	5
2	Boxes 2, 3 and 5 ticked	[3]	3
3	Speed = dist/time [1] = 45/3 [1] = 15 [1]	[3]	3
4	**(a)** A	[1]	
	(b) A	[1]	
	(c) C	[1]	
	(d) change speed (accelerate) [1] change direction [1]	[1] [1]	5
5	**(i)** Moment = F × d [1] = 30 × 40 [1] or = 30 × 0.4 = 1200 [1] = 12 Ncm [1] Nm	[4]	
	(ii) Anticlockwise [1]	[1]	5
6	W = mg or 1.5 × 10 [1] 12 N ≡ 1.2 kg [1] W = 15 (N) [1] or Total mass = 2.7 kg [1] Reading = 27 (N) [1]	[3]	3
7	**(a)** **(i)** conduction **(ii)** electron (independently marked)	[1] [1]	
	(b) **(i)** conduction **(ii)** atom/molecule (independently marked)	[1] [1]	4
8	E = useful energy output/energy input [1] = 80/200 [1] = 0.4 (40%) [1]	[3]	3

			AVAILABLE MARKS
9	**(i)** horizontal line from (50, 200) to (100, 200) [1] } allow ± 1 sq line from (100, 200) to (200, 0) [1] } tolerance [2]		
	(ii) 400 (m) [1]	[1]	3
10	**(a)** 16 (mm)	[1]	
	(b) line is straight	[1]	
	(c) **(i)** Extension	[1]	
	(ii) Total length = 36 mm (or 20 + 16) [1] Load = 7 (N) [1]	[2]	5
11	**(a)** momentum = mass × vel [1] = 2000 × 7 [1] = 14 000 (kgm/s) [1]	[3]	
	(b) friction [1]	[1]	
	(c) towards the centre (of the curve) [1]	[1]	5
12	**(a)** 500 (N)	[1]	
	(b) Power = work done/time [1]	[1]	
	= (500 × 2)/1.5 [2] allow ecf from (a)	[2]	
	= 666.7 [1] W [1]	[2]	6
		Total	**50**