

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Mark Schemes

Q1.

Question Number:	Answer	Additional guidance	Mark
	a description to include: kinetic energy (store) (of cyclist and /or bicycle) decreases / is transferred into(1) thermal energy (store) (of brakes / surroundings) increases (1)	KE for kinetic energy allow heat for thermal allow brakes get hotter ignore sound energy accept kinetic (energy) to heat (energy) for 2 marks in this context	(2) AO 1 1

Q2.

Question Number	Answer	Acceptable answers	Mark
(i)	20 (J)	200 – 180 (even if calculated value from this is incorrect)	(1)

Question Number	Answer	Acceptable answers	Mark
(ii)	(changed to) {thermal energy / heat}	dissipated (lost) to {surroundings / motor / air / atmosphere} sound / noise reject if kinetic, light or chemical is mentioned	(1)

Question Number	Answer	Acceptable answers	Mark
(iii)	$\frac{180}{200} \times 100$ (1) 90 (%) (1)	award full marks for correct answer with no working $\frac{180}{200}$ 0.9, 9/10 Or [100 – (20/200)] % not needed but if a unit is given then maximum score is 1	(2)

Q3.

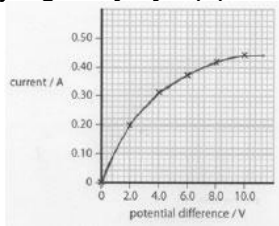
Question number	Answer	Additional guidance	Mark
(i)	An explanation linking energy has been dissipated /wasted / lost (1) as thermal energy (1)	energy has been transferred mechanically useful energy is less than total energy supplied identifies difference of 600(J) heat to the surroundings ignore sound accept (some) energy has been transferred to thermal store for 2 marks	(2) AO3

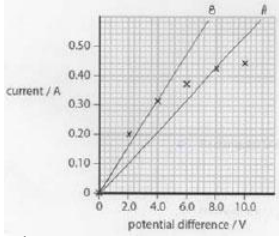
Question number	Answer	Additional guidance	Mark
(ii)	substitution (1) (efficiency =) $\frac{8400}{9000}$ evaluation (1) (efficiency =) 0.93	0.9 93(%) allow values that round to 0.93 or 93(%) award full marks for the correct answer without working	(2) AO2

Q4.

Question number	Answer	Additional guidance	Mark
	Explanation linking two from: choice of distance (1) 6.3 m (calculations of work done need) the distance moved in the direction of the force (1) (friction acts) along the slope / hypotenuse (1)	accept pushed up the slope	(2) A03

Q5.

	Answer	Acceptable answers	Mark
(a)(i)	D variable resistor		(1)
(a)(ii)	B in parallel with the lamp		(1)
(a)(iii)	A description including - resistance changed (1) - reduced/decreased/lowered (1) OR - voltage/p.d /EMF (of supply) changed (1) - increased /turned up/higher(1)	remove (variable) resistor /component X (2) number of batteries/number of cells <u>add</u> another cell/battery/battery pack/power pack/power supply (2)	(2)
(b)(i)	both points correct (1)	allow + / - half square	(1)
(b)(ii)	curve of best fit judged by eye (1) 	Must pass through zero and two other points. 5th point can be either (8.0,0.42) or (8.0, 0.44) straight line of best fit through origin tolerance between lines A and B shown	(1)

		on the diagram  5th point can be either (8.0,0.42) or (8.0, 0.44)	
(c)	substitution (1) 10/0.44 or 250/11 evaluation (1) 23 (ohms)	give full marks for correct answer, no working 22.7(ohms), 22.73 (ohms), 22.72(ohms) Ignore excessive decimal places.	(2)
(d)(i)	an explanation linking two of the following points • electric(al) (energy) (1) • (is converted) to heat / thermal (energy) (1) • (is converted) to light (1)	electricity	(2)

Total marks for question =10