Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	(students') reaction time (is significant compared with recorded time) (1)	g is really 9.8	**(1) AO2**

Question number	Answer	Additional guidance	Mark
(ii)	**One** from use light gates (1) use automatic timer (1) Use time lapse/ stroboscopic photography (1) drop from greater height (1)	ignore repeats or more people	**(1) AO3**

Q14.

Downloaded from www.merit-minds.com

	Answer	Additional guidance	Mark
(i)	an explanation linking **two** from: (wet road means) less / no friction (between tyres and road) (1) (wet weather means) increased stopping distance (1) (slower speed means) shorter braking / stopping distance (1) (dry weather / slower speed) reduces possibility of skidding / sliding / idea of losing control / crashing (1)	accept reverse arguments throughout accept (road) more slippery / less grip accept idea of reduced visibility accept braking or thinking distance in this context accept takes longer to slow down / stop ignore harder to brake	**(2)** **AO1**

Downloaded from www.merit-minds.com

	Answer	Additional guidance	Mark
(ii)	convert **either** distance or time (1) (31 m =) $\frac{31}{1000}$ (km) or 0.031 (km) **OR** (1 s =) $\frac{1}{3600}$ (h) = $\frac{1}{60\times60}$ (h) or 0.000 28 (h) evaluation (1) (31 m/s =) 110 (km/h)	 (130 km =) 130 × 1000 (m) or 130 000 (m) **OR** (1 h =) 60 x 60 (s) or 3600 (s) (130 km/h =) 36(.1) (m/s) accept 111.6 or 112 (km/h) for 2 marks ` accept 1860 m/min and 2167 m/min for 1 mark each award full marks for the correct answer without working	**(2)** **AO2**

Downloaded from www.merit-minds.com

	Answer	Additional guidance	Mark
(iii)	select and substitute into distance travelled = average speed x time (1) 46 = 31 x t rearrangement and evaluation (1) (t=) 1.48(3) (s) evaluation given to 2 sf (1) (t =) 1.5 (s)	 $31 = \frac{46}{t}$ $(t =) \frac{46}{31}$ award two marks for the correct evaluation without working any answer written to 2 sf independent mark 1.5 scores 3 marks 1.4 scores 2 marks 1.50 scores 2 marks 0.67 scores 2 marks 1400 scores 2 marks 0.673(9) scores 1 mark 1426 scores 1 mark	**(3)** **AO2**

Q2.

Downloaded from www.merit-minds.com

Question number	Answer	Additional guidance	Mark
(i)	An explanation that combines identification - knowledge (1 mark) and reasoning/justification - understanding (1 mark): • unbalanced / resultant force (1) • (provided by) tension in the string / (weight of) metal disc (1)		(2)

Question number	Answer	Additional guidance	Mark
(ii)	substitution into speed = d/t (1) 1.15 = d / 0.04 (1) evaluation (1) d = 0.046m = 4.6 cm (1)	full marks will be awarded for correct numerical answer without working	(2)

Question number	Answer	Additional guidance	Mark
(iii)	using $V^2 - u^2 = 2ax$ $V^2 = 1.15^2$ $= 1.3225$ (1) $2 \times a \times x = 2 \times 1.2 \times 0.55$ $= 1.32$ (1)	allow 1.3225 allow solving $V^2 - u^2 = 2ax$ for a	(2)

Q3.

	Answer	Acceptable answers	Mark
(i)	shown using data Any two from kinetic energy before = 12.5 + 0 (=12.5) (1) kinetic energy after = 4.5 + 8 (=12.5)	Kinetic energy is conserved/no energy lost	(2)

Downloaded from www.merit-minds.com

	(1) Kinetic energy is the same before and after the collision (1)		
(ii)	cyclotron (1)	named particle accelerator accept CERN	**(1)**

Downloaded from www.merit-minds.com