Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Mark Schemes

Q1.

Question Number	Answer	Additional guidance	Mark
	a description to include 3 points from: • measure a distance (at the bottom) / use mark(er)s (certain distance apart) (1) • starting timer (at first mark(er)) (1) • stopping timer (at 2nd mark(er)) OR measures a time (interval) (1) • (use speed) = distance/time (1)	use a light gate (or equivalent sensors idea) not over whole slope for this mark point use of video / (speed) camera /interrupts the light beam accept any time measured for this mp including data logger OR timer / stopwatch	(3) AO 2 2

Q2.

Question number	Answer	Additional guidance	Mark
(i)	A plan including four of the following measurement of appropriate distance (1) measurement of appropriate time (1) use of speed = $\frac{\text{distance}}{\text{Time}}$ (1) detail (1) e.g. repeat and average, use ruler/stop clock, mark a line near the top and bottom of liquid		**(4)** **AO3**

Question number	Answer	Additional guidance	Mark
(ii)	An explanation linking **two** from: add more lines (at equal distances)(1) measure the time of fall for each distance (1) compare the times (1)	use longer test tube / use different heights of liquid / use different sections of the liquid e.g. {equal times =constant speed} / {shorter time = acceleration}	**(2)** **AO3**

Q3.

Question number	Answer	Additional guidance	Mark
(i)	0.45 (s) (1)	Allow any value ≥ 0.4 and ≤ 0.5	(1)

Question number	Answer	Additional guidance	Mark
(ii)	An explanation that combines improvement of the experimental procedure (1 mark) and justification/reasoning which must be linked to the improvement (1 mark) • take pictures more frequently (1) • in order to determine exact time of the release. (1)	other responses may be acceptable	(2)

Question number	Answer	Additional guidance	Mark
(iii)	Substitution (1) F = 7.26 x 20.6 Evaluation (1) 150 (N)	Accept 149.6 (N) full marks will be awarded for correct numerical answer without working	(2)

Question number	Answer	Additional guidance	Mark
(iv)	Rearrangement (1) v = a x t Substitution (1) v = 23 x 0.48 Evaluation (1) 11 (m/s)	Accept 11.04(m/s) full marks will be awarded for correct numerical answer without working	(3)

Q4.

Question number	Indicative content	Mark
	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO1 strand 1 (6 marks)** factors concerning driver • change in reaction time • tiredness • effect of drugs • type of footwear • how hard the driver presses the pedal effect of any of the above on stopping distance, • increased stopping distance • increased thinking distance • increased reaction time factors concerning car or road • mass / weight of car • speed of car • state of brakes • state of tyres • state of road effect of any of the above on stopping distance, e.g. • increased thinking/braking distance • increased stopping distance	**(6)**

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3-4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

SUMMARY, for guidance

Level	Mark	Additional Guidance	General additional guidance – the decision within levels e.g. - At each level, as well as content, the scientific coherency of what is stated will help place the answer at the top, or the bottom, of that level.
	0	No rewardable material.	
Level 1	1–2	Additional guidance Elements of physics, i.e. isolated factor(s) about **either** car **or** driver	Possible candidate responses worn tyres / tired driver worn tyres and icy road
Level 2	3–4	Additional guidance Some understanding shown, i.e. **either** link between factor and effect **or** a driver factor **and** a car factor	Possible candidate responses worn tyres cause increased stopping distance. **or** worn tyres and tired driver
Level 3	5–6	Additional guidance Understanding is detailed and fully developed, i.e. link between factor and effect - both for driver **AND** for car	Possible candidate responses worn tyre causes increased stopping distance. **and** tired driver causes increased stopping distance