

Name of the Student: _____

Max. Marks : 11 Marks

Time : 11 Minutes

Mark Schemes

Q1.

	Answer Additional guidance	Mark
	B 3.0 s A, C and D are incorrect as they are the wrong time.	(1) AO3

Q2.

Question Number	Answer	Additional guidance	Mark
	B distance A, C and D are incorrect as these are vector quantities		(1) AO1

Q3.

Question number	Answer	Mark
	<input checked="" type="checkbox"/> B force Options A, C and D are all scalars.	(1)

Q4.

Question Number	Answer	Additional guidance	Mark
	an explanation linking: use an electronic timer / (1) to eliminate reaction time (1)	light gate/ data logger there are other options which should be judged to this pattern (e.g. increase distance to reduce effect of reaction time)	(2) AO 3 3b

Q5.

Question number	Indicative content	Mark
	<p>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.</p> <p>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.</p> <p style="text-align: center;">A02 (strand 2) (6 marks)</p> <p><u>Determining force</u></p> <ul style="list-style-type: none">• Use of $F = (mv - mu)/t$ or $F = ma$• mass (of trolley(s)) needed• and times during impact (t) <p><u>Showing effect of crumple zone</u></p> <ul style="list-style-type: none">• experiment repeated with and without the spring• (note) difference in contact times• use of spring as crumple zone• with spring, time for contact greater, less impact force <p><u>Precautions or controls</u></p> <ul style="list-style-type: none">• times repeated and average taken• careful controls – same starting position / same angle of slope / release without pushing etc.	<p>(6)Exp</p>

Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> No awardable content
Level 1	1-2	<ul style="list-style-type: none"> The explanation attempts to link and apply knowledge and understanding of scientific enquiry, techniques and procedures, flawed or simplistic connections made between elements in the context of the question. Lines of reasoning are unsupported or unclear. (AO2)
Level 2	3-4	<ul style="list-style-type: none"> The explanation is mostly supported through linkage and application of knowledge and understanding of scientific enquiry, techniques and procedures, some logical connections made between elements in the context of the question. Lines of reasoning mostly supported through the application of relevant evidence. (AO2)
Level 3	5-6	<ul style="list-style-type: none"> The explanation is supported throughout by linkage and application of knowledge and understanding of scientific enquiry, techniques and procedures, logical connections made between elements in the context of the question. Lines of reasoning are supported by sustained application of relevant evidence. (AO2)

SUMMARY, for guidance

Level	Mark	Additional Guidance	General additional guidance – the decision within levels
	0	No rewardable material.	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.
Level 1	1–2	<u>Additional guidance</u> Elements of physics present i.e. isolated knowledge of techniques and procedures – two unconnected statements from any section	<u>Possible candidate responses</u> Use $F = (mv - mu)/t$ Use $F = ma$ keep slope the same repeat and average use spring as crumple zone
Level 2	3–4	<u>Additional guidance</u> Some knowledge of techniques and procedures with a logical connection made in one section and statement from one more section	<u>Possible candidate responses</u> Measurements (difference in contact times) with and without the spring Use $F = ma$ in finding the force
Level 3	5–6	<u>Additional guidance</u> Detailed knowledge of techniques and procedures with logical connections made in two sections and statement from one more section	<u>Possible candidate responses</u> Measure the trolley mass(es)/ velocities/ impact time(s) and use $F = ma$ in finding the force Measurements (difference in contact times) with and without the spring Same starting place for trolley each time.