PEARSON EDEXCEL GCSE COMBINED SCIENCE (HIGHER) · 1SC0

PHYSICS



MARK SCHEME

TOPIC 2: MOTION AND FORCES (PAPER 1)

SCORE	PERCENTAGE
/161	%

STEMUP

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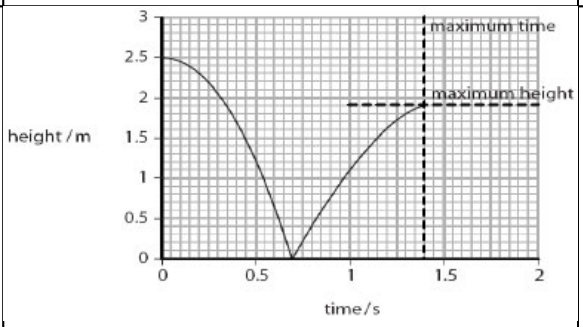
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Mark Scheme

Q1.

	Answer	Acceptable answers	Mark
(i)	2.5 (m)	Allow answers between (and	**(1)**

		including) 2.45 & 2.55	
(ii)	0.7 (s)	Allow answers between (and including) 0.68 & 0.72	**(1)**
(iii)	 line: same shape as original (1) peak at 1.9 m (1) time taken < 0.7 s (1)	Ignore any part of the graph after the peak	**(3)**
(iv)	An explanation linking: <u>energy</u> lost (1) in collision with ground / air resistance (1)	Inelastic collision worth (2) as sound or heat	**(2)**

(**Q10 1SC0/1PH, June 2013**)

Q2.

Question number	Answer	Mark
(a)	Idea of a direct reading (without calculation)	**(1)**

Question number	Answer	
(b)	If student B drops the ruler, they are not really measuring their own reaction time as they know when ruler has been dropped	**(1)**

Question number	Answer	Additional guidance	Mark
(c)(i)	calculating the mean (1) 18.36 rounding to 2 s.f. (1) 18 (cm)	award full marks for correct numerical answer without working	(2)

Question number	Answer	Additional guidance	Mark
(c)(ii)	Rearrangement (1) $t = \sqrt{\frac{\text{distance}}{500}}$ Substitution and answer (1) time = 0.17 (s)	award full marks for correct numerical answer without working allow answers which round to 0.17, e.g. 0.1673	(2)

Question number	Answer	Additional guidance	Mark
(d)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (1 mark): • 25.5 is an anomalous result (1) • (because) it is much further away from the mean than the other results (1)	ignore 19	(2)

Question number	Answer	Mark
(e)	• Take more readings (1) • Idea that a third student should also measure the reaction time (1)	(2)

Question number	Answer	Additional guidance	Mark
(f)	An answer that combines the following points to provide a logical description of the plan/method/experiment: • using a larger group of students/large population of students (1) • and measure how their reaction time varies with age/height (1)	allow any suitable variable	(2)

Q3.

Question number	Answer	Additional guidance	Mark
(a)(i)	Calculating the mean (1) 18.36 Rounding to 2 s.f. (1) 18 (cm)	award full marks for correct numerical answer without working	**(2)**

Question number	Answer	Additional guidance	Mark
(a)(ii)	Rearrangement (1) $t = \sqrt{\frac{\text{distance}}{500}}$ Substitution and answer (1) time = 0.17 (s)	award full marks for correct numerical answer without working allow answers which round to 0.17, e.g. 0.1673	**(2)**

Question number	Answer	Additional guidance	Mark
(b)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (1 mark): • 25.5 is an anomalous result (1) • (because) it is much further away from the mean than the other results (1)	ignore 19	**(2)**

Question number	Answer	Mark
(c)	• Take more readings (1) • Idea that a third student should also measure the reaction time (1)	**(2)**

Question number	Answer	Additional guidance	Mark
(d)	An answer that combines the following points to provide a logical description of the plan/method/experiment: • using a larger group of students/large population of students (1) • and measure how their reaction time varies with age/height (1)	allow any suitable variable	(2)

(**Q02 1SC0/1PH, SAM 2016**)

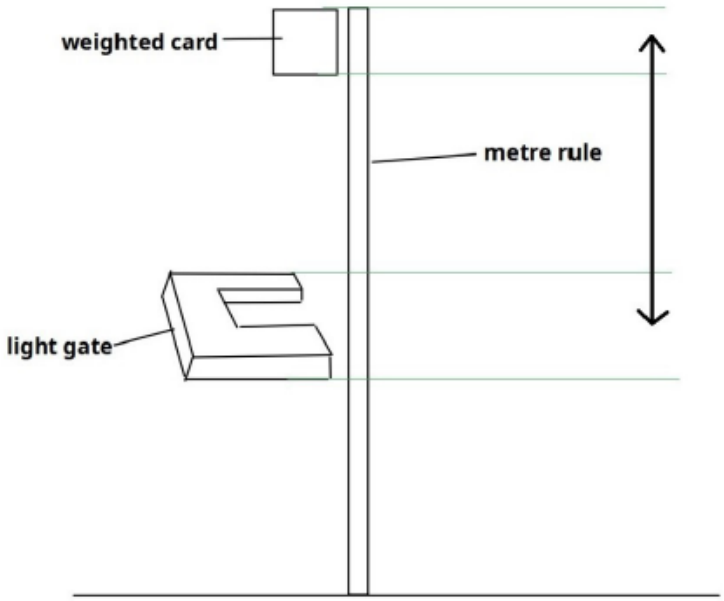
Q4.

Question number	Answer	Additional guidance	Mark
(i)	selection of (p =) m × v (1) evaluation (1) (momentum =) 15 unit (1) kg m/s	(momentum =) 0.43 × 36 allow numbers that round to 15 e.g. 15.48 allow 15.5 award 2 marks for the correct value without working kg m s^{-1} allow N s	**(3)** **AO2.1**

Question number	Answer	Additional guidance	Mark
(ii)	selection of force = change in momentum / time (1)	$2700 = \frac{15}{\text{time}}$ OR $2700 = \frac{\text{their (a)(i)}}{\text{time}}$ OR $(\text{time}) = \frac{15}{2700}$ OR $(\text{time}) = \frac{\text{their (a)(i)}}{2700}$	(2) exp AO2.1
	evaluation (1) 0.0056 (s)	allow numbers that round to 0.0056 e.g. 0.005555 (using Δp=15) or numbers that round to 0.0057 e.g. 0.005733 (using Δp=15.48) allow ECF from their (a)(i) for 2 marks without working	
	ALTERNATIVE METHOD selection of F=ma **and** a=(v-u)/t (1) evaluation (1) 0.0057 (s)	allow numbers that round to 0.0057 e.g. 0.00573 award full marks for the correct value without working	

Question number	Answer	Additional guidance	Mark
(iii)	explanation linking equal **and** opposite forces (1) (which are) force exerted by the foot (on the ball) (1) (and) force exerted by the ball (on the foot) (1)	 accept action and reaction are equal and opposite (which are) force exerted (by the foot) on the ball (1) (and) force exerted (by the ball) on the foot (1) award 2 marks for force on ball = force on foot award 3 marks for force on ball = force on foot but in opposite direction ignore references to other named forces and energy	(3) AO2.1

Q5.

Question number	Answer	Additional guidance	Mark
(i)	line drawn anywhere between the two ranges shown(1)  	upper end of drawn line/arrow between the top limits lower end of drawn line/arrow between the bottom limits accept drawn line without arrow heads or "h".	**(1)** **AO1.2**

Question number	Answer	Additional guidance	Mark
(ii)	to check for anomalies (1)	improve reliability / improve precision / (check for) consistency / (reduce) random error / calculate an average ignore accuracy / reproducible	**(1)** **AO1.2**

Question number	Answer	Additional guidance	Mark
(iii)	Any **two** from use a clamp to hold the ruler / light-gate (1) ensure eye is level (with the edge being measured and the rule) (1) use a set square (to aid the measurement) (1) make sure the rule is vertical (1) use a ruler with an improved resolution (1)	 look at straight (on) use of (horizontal) marker/pointer stand the ruler upright use a ruler with small(er) divisions ignore references to human error / repeat reading (by others)	**(2)** **AO1.2**

(**QU04a 1SC0/1PF, June 2025**)

Q6.

	Answer	Acceptable answers	Mark
	A 600 kg m/s		**(1)**

(**Q05 1SC0/1PH, June 2013**)

Q7.

	Answer	Acceptable answers	Mark
(a)	**C** when the bungee cord is stretched the most		**(1)**
(b)	**A** 600 kg m/s		**(1)**

(c)(i)	Substitution: (1) 60 × 10 × 50 or 600 × 50 Evaluation: (1) 30 000 Unit: (1) J / Nm	 give two marks for correct answer no working j / joule 30 kJ for full marks	**(3)**	
(c)(ii)	After falling 50 m / when the cord becomes straight/when cord starts to stretch	tension starting to increase at terminal velocity ignore maximum velocity/speed	**(1)**	
(c)(iii)	An explanation linking any two of not all GPE is transferred to KE (1) some {of the GPE transfers to thermal energy /work is done} (1) due to drag (1)	 not all GPE goes to KE maximum energy is same (value) as GPE before falling /speed does not reach the speed at which he should fall some lost as heat/sound (of rope or movement through air) (air) resistance / friction ignore wind	**(2)**	

(**Q03 1SC0/1PH, June 2013**)

Q8.

Question	Answer	Additional guidance	Mark
(i)	x represents **time** OR **t** y represents **velocity** OR **v**	both correct in correct place for 1 mark ignore units	**1 AO1.1**

Question	Answer	Additional guidance	Mark
(ii)	attempt to find a gradient of the line that would give an answer between 0.18 and 0.24 (1) evaluation(1) 0.21 (m/s^2)	e.g. $\frac{12.5}{60}$ or $\frac{10}{42}$ values that are between 0.20 and 0.22 (m/s^2) e.g. 0.2083 do not allow fractions in the answer line for evaluation mark award full marks for the correct answer without working	**2** **AO2.1**

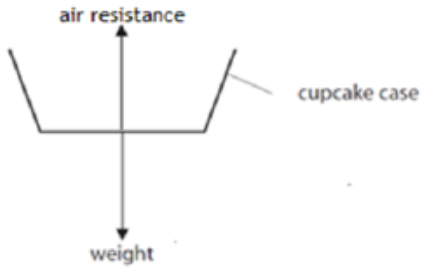
Question	Answer	Additional guidance	Mark
(iii)	0	zero	**1** **AO2.1**

(**QU04c 1SC0/1PH, June 2024**)

Q9.

Question number	Answer	Additional guidance	Mark
(i)	A description to include any 4 from: measure height (1) measure time of fall (1) use (average) speed = distance /time (1) repeat with different number of cupcake cases in the stack/more cupcake cases (1) repeat **and** average time (of fall for each stack of cupcake cases) (1) plot a graph (speed of fall against number of cupcake cases dropped) (1)	 allow 'keep same height' allow in this context hold against (fixed point) on metre rule allow 'time it' accept cupcakes for cupcake cases	**(4) AO1**

Question Number	Answer	Additional guidance	Mark
(ii)	substitution (1) (W=)0.005 x 10 evaluation (1) 0.05 (N)	 5×10^{-2} (N) do not allow power of ten error award full marks for the correct answer with no working give full credit for use of g=9.8 or 9.81 N/kg	**(2) AO2**

Question number	Answer	Additional guidance	Mark
(iii)	 air resistance arrow (1)	judge by eye any vertical upward arrow outside or inside the cupcake case ignore length of arrow arrow need not touch cupcake holder ignore label on arrow	(1) AO2

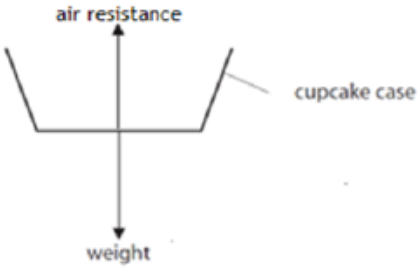
Question number	Answer	Additional guidance	Mark
(iv)	zero / there is none / 0 / it has no acceleration	ignore 'constant' ignore units	(1) AO2

(**QU05b 1SC0/1PF, June 2023**)

Q10.

Question number	Answer	Additional guidance	Mark
(i)	A description to include any 4 from: measure height (1) measure time of fall (1) use (average) speed=distance ÷ time (1) repeat with different number of cupcake cases in the stack/more cupcake cases (1) repeat **and** average time (of fall for each stack of cupcake cases) (1) plot a graph (speed of fall against number of cupcake cases dropped) (1)	 allow 'keep same height' allow in this context hold against (fixed point on) metre rule allow 'time it' accept cupcakes for cupcake cases	**(4)** **AO1**

Question Number	Answer	Additional guidance	Mark
(ii)	substitution (1) (W=)0.005 x 10 evaluation (1) 0.05 (N)	 5×10^{-2} (N) do not allow power of ten error award full marks for the correct answer with no working give full credit for use of g=9.8 or 9.81 N/kg	**(2)** **AO2**

Question number	Answer	Additional guidance	Mark
(iii)	 air resistance arrow (1)	Judge by eye any vertical upward arrow outside or inside the cupcake case ignore length of arrow arrow need not touch cupcake holder ignore label on arrow	(1) AO2

Question number	Answer	Additional guidance	Mark
(iv)	zero / there is none / 0 / it has no acceleration	ignore 'constant' ignore units	(1) AO2

(**QU01b 1SC0/1PH, June 2023**)

Q11.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) (force =) $\frac{8.7}{0.35}$ evaluation (1) 25 (N)	 use of force = $\frac{\text{change in momentum}}{\text{time}}$ allow numbers that round to 25 e.g 24 .8571 award full marks for correct answer without working.	(2) AO2

Question number	Answer	Additional guidance	Mark
(ii)	(magnitude) 25 (N) (1) (direction) down(wards)/ towards floor (1)	ecf from i allow arrow drawn pointing down "south"	**(2)** **AO3**

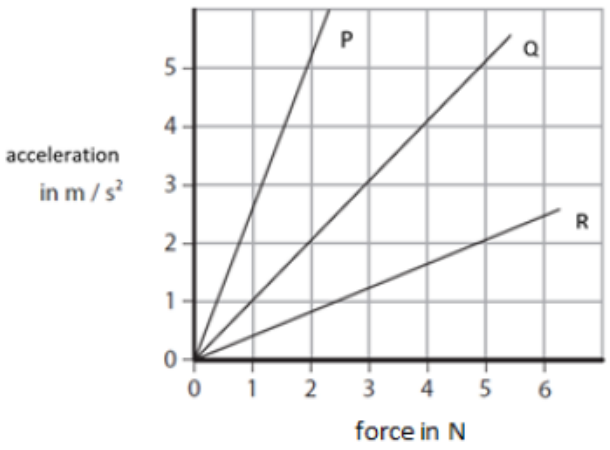
(**Q05c 1SC0/1PH, Nov 2021**)

Q12.

Question number	Answer	Additional guidance	Mark
	16.0 (m/s) read from graph (1) Substitution (1) (distance travelled =) 16 × 0.5 Answer (1) 8.0 (m) (1)	award full marks for correct numerical answer without working ecf for substitution and answer using wrong speed value	**(3)**

(**Q04aii 1SC0/1PF, SAM 2016**)

Q13.

Question number	Answer	Additional guidance	Mark
(i)	 any correct points from line Q e.g. substitution (1) mass = 2/2 evaluation (1) 1 (kg)	Accept answers in the range 1 to 1.05 (kg) full marks will be awarded for correct numerical answer without working	(2)

Question number	Answer	Additional guidance	Mark
(ii)	an answer that combines points of interpretation to provide a logical description: • (trolley/it) has the smallest acceleration for the largest force • (and) m = F/a		(2)

(**Q02b 1SC0/1PF, SAM**)

Q14.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) 371 = (64.5+ m) x 3.5 rearrangement (1) m+64.5 = 371 / 3.5 evaluation of total mass (1) m+64.5 = 106 (kg) evaluation of woman's mass (1) m = 106-64.5 = 41.5 (kg)	full marks will be awarded for correct numerical answer without working	(4)

Question number	Answer	Additional guidance	Mark
(ii)	substitution (1) KE = ½ x 64.5 x 3.5^2 evaluation (1) 395 (J)	allow answers which round to 395 e.g. 395.0625 full marks will be awarded for correct numerical answer without working	(2)

(**Q06a 1SC0/1PH, SAM**)

Q15.

Question number	Answer	Additional guidance	Mark
(i)	substitution and conversion (1) v = 0.05/0.08 evaluation (1) v = 0.63 (m/s)	full marks will be awarded for correct numerical answer without working	(2)

Question number	Answer	Additional guidance	Mark
(ii)	a= (v-u) / t (1)		(1)

Question number	Answer	Additional guidance	Mark
(iii)	substitution (1) (1.1-0.72) / 0.53 evaluation (1) 0.72 m/s^2	 full marks will be awarded for correct numerical answer without working	(2)

(**Q02a 1SC0/1PF, SAM**)

Q16.

Question number	Answer	Additional guidance	Mark
	substitution (1) (a=) $\frac{12-2(.0)}{4(.0)}$ evaluation (1) 2.5 (m/s^2)	 award full marks for correct answer without working.	(2) AO2

(**Q03d 1SC0/1PF, Nov 2021**)

Q17.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) a = $\frac{25\ (-\ 0)}{5}$ evaluation (1) 5(.0) (m/s^2)	 award full marks for correct answer without working.	(2) AO2.1

Question number	Answer	Additional guidance	Mark
(ii)	selection and substitution (1) (distance = speed x time =) 25 x 10 evaluation (1) 250 (m)	award full marks for correct answer without working	**(2)** **AO2.1**

(**QU02b 1SC0/1PF, June 2025**)

Q18.

	Answer	Additional guidance	Mark
	correct data point(s) seen (1) (accel =) $\frac{\Delta v}{t}$ (1) evaluation (1) 2.9 (m/s^2)	allow MP1 and MP2 in either order any data point(s) on the line e.g. (1.4,4) allow 'gradient' allow e.g. $\frac{4}{1.4}$ for 2 marks allow values that round to 2.9 (m/s^2) (e.g. 2.857...) award full marks for the correct answer without working	**(3)** **AO3**

(**QU03c 1SC0/1PH, June 2023**)

Q19.

Question number	Answer	Additional guidance	Mark
(i)	attempt to use correct data from graph or equation (1) substitution (1) (a =) $\frac{26 - 14}{34}$ evaluation to 2 sf (1) 0.35 (m/s^2)	quoting $a = \frac{(\Delta) v}{t}$ or a = gradient (of line) 0.3529... scores mp1 and mp2 $\frac{26}{34}$ scores mp1 independent mark award full marks for correct answer without working.	**(3)** **AO2**

Question number	Answer	Additional guidance	Mark
(ii)	attempt to calculate area under the line (1) calculates EITHER area of triangle OR area of rectangle (1) 204 (m) or 476 (m) evaluation (1) 680 (m)	accept count squares use of $v^2-u^2 = 2ax$ $x = \frac{v^2-u^2}{2a}$ allow ecf from (i) award full marks for correct answer without working award 1 mark for final answer 408 (m)	**(3)** **AO2**

(**Q04b 1SC0/1PH, Nov 2021**)

Q20.

	Answer	Additional guidance	Mark
(i)	conversion of time to s (1) (t =) 0.012 **OR** 12×10^{-3} **OR** 1.2×10^{-2} substitution (1) $(F=)\frac{(0.075 \times -15.0) - (0.075 \times 8.2)}{0.012}$ OR $(F=)\frac{(0.075 \times 15.0) - (0.075 \times -8.2)}{0.012}$ OR $(F=)\frac{0.075 \times (15.0 + 8.2)}{0.012}$ evaluation (1) (-)150 (N)	substitution and conversion in either order ignore signs on velocity accept time to any power of ten for substitution mark $(F=)\frac{(1.125) + (0.615)}{0.012}$	**(3)** **AO2**

		145 (N) scores 3 marks 145 (N) to any other power of ten scores 2 marks maximum 42.5 (N) scores 2 marks maximum 42.5 (N) to any other power of ten scores 1 mark maximum 93.75 (N) or 51.25(N) 1.933 scores 1 mark maximum award full marks for correct answer without working	

	Answer	Additional guidance	Mark
(ii)	Any two from: (forces are) equal / same size (1) (forces are) opposite (direction) (1) (forces) act on different bodies (1) same type of force (1)	no marks awarded for answers in terms of energy (forces are) one to the left, one to the right one (force) acts on racket, one acts on ball both are contact forces if no other marks awarded, allow action and reaction (acting) for 1 mark	**(2)** **AO1**

(**QU04c 1SC0/1PH, June 2022**)

Q21.

Question number	Answer	Additional guidance	Mark
	substitution (1) (average speed =) $\frac{1200}{80}$ evaluation (1) 15 (m/s)	 award full marks for the correct answer without working	**(2)**

(**Q02b 1SC0/1PF, Nov 2020**)

Q22.

Question number	Answer	Additional guidance	Mark
(c)	substitution (1) (change in velocity=) 3 x 7 evaluation (1) 21 (m/s)	award full marks for the correct answer with no working	**(2)** **AO2**

(**QU05c 1SC0/1PF, June 2023**)

Q23.

Question Number	Answer	Additional guidance	Mark
(i)	substitution in $v^2 - u^2 = 2ax$ (1) $24^2 - 7.6^2 = 2 \times 3 \times x$ rearrangement (1) $(x =) \frac{24^2 - 7.6^2}{6}$ evaluation (1) 86 (m)	accept rearrangement and substitution in either order allow numbers that round to 86 (m) award full marks for the correct answer without working	**(3)**

Question Number	Answer	Additional guidance	Mark
(ii)	recall and substitution (1) $(a = \frac{v - u}{t})$ $3.0 = \frac{24 - 7.6}{t}$ rearrangement (1) $t = \frac{v - u}{a}$ OR $(t =) \frac{24 - 7.6}{3.0}$ evaluation (1) 5.5 (s)	Allow alternative method: average speed = distance / time i.e. 15.8 = 86(.37) / time (t =) 86(.37) / 15.8 allow numbers that round to 5.5 (s) OR numbers that round to 5.4 if using alternative method and distance = 86 award full marks for the correct answer without working no marks for t = d / (v-u) = 86(.37) / (24-7.6) giving 5.3 s as an answer	**(3)**

(**Q05c 1SC0/1PH, June 2019**)

Q24.

	Answer	Additional guidance	Mark
	(distance =) area (under graph) (1) substitution (1) ½(1.4 x 4) + (3.6 x 4) + ½(1x 4) evaluation (1) 19 (m)	may be seen on graph 2.8 + 14.4+ 2.0 ½ x [3.6+6] x 4 allow values that round to 19 (m) (e.g. 19.2..) award full marks for the correct answer without working if no other marks scored allow (4 x 6 =)24 (m) for 1 mark	**(3)** **AO3**

(**QU03d 1SC0/1PH, June 2023**)

Q25.

Question Number	Answer	Additional guidance	Mark
	substitution (1) $\frac{80^{(2)} (- 0^{2})}{2 \times 4}$ evaluation (1) 800 (m)	 allow 1 mark for seeing $\frac{80}{8}$ ignore any minus signs award full marks for the correct answer without working	**(2)**

(**Q04b 1SC0/1PF, June 2019**)

Q26.

	Answer	Additional guidance	Mark
	attempt to find momentum change (Δp) (1) (Δp) =± 1.4 substitution in to $F = \frac{\Delta p}{t}$ (1) $\frac{\pm 1.4}{70 \times 10^{-3}}$ evaluation (1) (±) 20 (N)	± 0.8 ± 0.6 allow (Δp) =± 0.2 allow $\frac{\pm 0.2}{70 \times 10^{-3}}$ answers which round to (±) 20 to any other power of 10 score 2 marks answers which round to (±) 2.9 scores 2 marks answers which round to (±) 2.9 to any other power of 10 score 1 mark award full marks for the correct answer without working	**(3)** **AO2**

(**QU06b 1SC0/1PH, June 2023**)

Q27.

Question Number	Answer	Additional guidance	Mark
	substitution (1) (F=) 1200 x 2.4 evaluation (1) 2900 (N)	 accept 2880 (N) award one mark for power of ten error award full marks for the correct answer with no working	**(2)** **AO2**

(**QU02b 1SC0/1PF, June 2023**)

Q28.

Question Number	Answer	Additional guidance	Mark
	substitution (1) 1800 x 1.2 evaluation (1) 2200 (N)	accept 1800 kg x 1.2 m/s^2 reject 1800 x 1.2^2 2160 (N) award full marks for the correct answer without working allow 1 mark total for 2200 OR 2160 with any other power of ten	**(2)**

(**Q01b 1SC0/1PF, June 2019**)

Q29.

Question number	Answer	Additional guidance	Mark
(i)	rearrangement (1) $h = \frac{\Delta GPE}{m \times g}$ evaluation (1) (h) = 56 (m)	$h = \frac{39\,000}{70 \times 10}$ allow numbers that round to 56 (m) e.g. 55.71 allow numbers that round to 57 (m) e.g. 56.85 (use of g=9.8 N/kg) award full marks for correct answer without working	**(2)** **AO3.2**

Question number	Answer	Additional guidance	Mark
(ii)	selection of $v^2 - u^2 = 2 \times a \times x$ (1) rearrangement (1) $a = \frac{v^2 (- u^2)}{2 \times x}$ evaluation (1) 1.8 (m/s^2) ALTERNATIVE METHOD calculation of time = 14.814 using time = distance / average speed (1) substitution (1) a (=(v-u) /t) = $\frac{27(-0)}{14.814}$ evaluation (1) 1.8 (m/s^2)	$27^2 (- 0^2) = 2 \times a \times 200$ allow $27^2 (- 0^2) = 2 \times a \times$ their (a)(i) $a = \frac{27^2(- 0^2)}{2 \times 200}$ allow $a = \frac{27^2(- 0^2)}{2 \times$ their (a)(i) no ecf for evaluation allow numbers that round **down** to 1.8 (m/s^2) e.g. 1.8225 award full marks for correct answer without working.	**(3)** **AO3.2**

Question number	Answer	Additional guidance	Mark
(iii)	An explanation linking (measure) GPE at top/start and KE at bottom/end (1) energy (at top) subtract energy (at bottom) (1)	 allow subtraction of any energies allow difference for subtraction award 2 marks for GPE at top subtract KE at bottom allow for 2 marks 39 000 – 25 515 OR 13485	**(2)** **AO3.3a**

(**QU04a 1SC0/1PH, June 2025**)

Q30.

Question	Answer	Additional guidance	Mark
	identification of equation and substitution (1) 450 = m x 0.35 rearrangement and evaluation (1) (m=) $\frac{450}{0.35}$ 1300 (kg)	 accept values which round to 1300 (kg) e.g. 1286 (kg) award full marks for the correct answer without working	**2** **AO2.1**

(**QU04b 1SC0/1PH, June 2024**)

Q31.

Question number	Answer	Additional guidance	Mark
	rearrangement (1) $m = \frac{f}{a}$ substitution and conversion (1) $m = \frac{1870}{1.83}$ answer and rounding to 3 s.f. (1) 1020 (kg)	 maximum 2 marks if kN not converted to N award full marks for correct numerical answer without working	 **(3)**

(**Q06a 1SC0/1PF, SAM 2016**)

Q32.

Question number	Answer	Additional guidance	Mark
	Two stage calculation substitution$_1$ (1) $(v^2 - 0 =)\ 2 \times 10 \times 3.8$ evaluation of v (1) $(v =)$ 8.7 (m/s) substitution$_2$ (1) $0.40 = m \times 8.7$ rearrangement and evaluation (1) $(m =)$ 0.046 (kg)	 use of $v^2 - u^2 = 2ax$ OR $\frac{1}{2} mv^2 = mgh$ 76 allow numbers that round to 8.7 e.g. 8.718 use of $p = mv$ allow numbers that round to 0.046 e.g. 0.04598 award full marks for correct answer without working.	**(4)** **AO2**

(**Q05d 1SC0/1PH, Nov 2021**)

Q33.

	Answer	Additional guidance	Mark
(i)	2.4 (N) OR 2.375 (N) OR 2.38 (N)		**(1)** **AO2.2**

	Answer	Additional guidance	Mark
(ii)	straight line extended to meet h = 0.80 m axis (1) 3.1 (N) (1)	judge by eye allow 3.05 to 3.20 inclusive award full marks for the correct answer without working	**(2)** **AO2.2**

	Answer	Additional guidance	Mark
(iii)	select two points on the line (1) evaluation (1) 3.90 ± 0.10 (N/m)	allow triangle drawn on graph award full marks for the correct answer without working	**(2)** **AO2.2**

(**QU05c 1SC0/1PF, June 2025**)

Q34.

Question number	Answer	Additional guidance	Mark
(i)	2.4 (N) OR 2.375 (N) OR 2.38 (N)		**(1)** **AO2.2**

Question number	Answer	Additional guidance	Mark
(ii)	straight line extended to meet h = 0.80 m axis (1) 3.1 (N) (1)	judge by eye allow 3.05 to 3.20 inclusive award full marks for the correct answer without working	**(2)** **AO2.2**

Question number	Answer	Additional guidance	Mark
(iii)	select two points on the line (1) evaluation (1) 3.90 ± 0.10 (N/m)	allow triangle drawn on graph award full marks for the correct answer without working	**(2)** **AO2.2**

(**QU01b 1SC0/1PH, June 2025**)

Q35.

	Answer	Additional guidance	Mark
	selection (1) $p = m \times v$ substitution (1) $6.6 (\times 10^{-26}) \times 480$ evaluation (1) 3.2×10^{-23} (kg m/s)	allow mom(entum) = mass x velocity allow numbers that round to 3.2×10^{-23} e.g. 3.168×10^{-23} award full marks for the correct answer without working $6.6 (\times 10^{-26}) \times 480$ seen scores MP1 and MP2, 2 marks 3.2 to any other power of ten scores MP1 and MP2, 2 marks	**(3)** **AO2**

(**QU06a 1SC0/1PH, June 2023**)

Q36.

Question number	Answer	Additional guidance	Mark
	rearrangement of $\frac{(v-u)}{t} = a$ (1) $v = u + at$ substitution (1) $v = 0 + 1.83 \times 16$ answer (1) 29.3 (m/s)	award full marks for correct numerical answer without working	**(3)**

(**Q06b 1SC0/1PF, SAM 2016**)

Q37.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) (t =) $\frac{10 - 6.2}{2.5}$ evaluation (1) (t =) 1.5 (s)	 $\frac{3.8}{2.5}$ allow $\frac{6.2 - 10}{2.5}$ or $\frac{-3.8}{2.5}$ 1.52 (s) allow –1.5(2) (s) award full marks for correct answer without working	**2** **AO2.1**

Question number	Answer	Additional guidance	Mark
(ii)	substitution OR rearrangement (1) $(-)10^2 = 2 \times (-)\ 4.4 \times x$ evaluation (1) (x =) 11 (m)	 $(x) = \frac{v^2 - u^2}{2 \times a}$ $(x=)\ \frac{(-)10^2}{2 \times (-)\ 4.4}$ allow values that round to 11 (m) e.g. 11.36 (m) ignore negative sign in answer line	**2** **AO2.1**

		accept 1.1(36) for one mark award full marks for correct answer without working	

(**QU06b 1SC0/1PF, June 2024**)

Q38.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) (t =) $\frac{10 - 6.2}{2.5}$	$\frac{3.8}{2.5}$ allow $\frac{6.2 - 10}{2.5}$ or $\frac{-3.8}{2.5}$ 2.5	**2** **AO2.1**
	evaluation (1) (t =) 1.5 (s)	1.52 (s) allow –1.5(2) (s) award full marks for correct answer without working	

Question number	Answer	Additional guidance	Mark
(ii)	substitution OR rearrangement (1) $(-)10^2 = 2 \times (-)\ 4.4 \times x$	 $(x =)\ \frac{v^2 - u^2}{2 \times a}$ $(x =)\ \frac{(-)10^2}{2 \times (-)\ 4.4}$	**2** **AO2.1**
	evaluation (1) (x =) 11 (m)	 allow values that round to 11	
		(m) e.g. 11.36 (m) ignore negative sign in answer line accept 1.1(36) for one mark award full marks for correct answer without working	

(**QU02b 1SC0/1PH, June 2024**)

Q39.

Question number	Answer	Additional guidance	Mark
	substitution (1) (t^2=) $\frac{2 \times 1.4}{10}$ evaluation (1) (t =) 0.53 (s)	 0.28 allow numbers that round to 0.53 e.g. 0.52915 award full marks for correct answer without working.	**(2) AO2**

(**Q05a 1SC0/1PH, Nov 2021**)

Q40.

Question	Answer	Additional Guidance	Mark
	substitution or rearrangement (1) 3500 = $\frac{53 \times 4 (- 53 \times 0)}{\text{time}}$ or (time=)$\frac{\text{change in momentum}}{\text{force}}$	in either order 3500 = $\frac{212}{\text{time}}$ (time =) $\frac{53x4}{3500}$ (time =) $\frac{212}{3500}$ (t =) $\frac{mv - mu}{F}$	**3 AO2 .1**

	evaluation (1) 6.06×10^{-2} (s) or 0.0606 (s) rounded to 2sf (1) 6.1×10^{-2} (s) or 0.061 (s)	accept 0.06057 (s) 0.06 (s) accept their calculation rounded to 2sf 0.060 scores 2 marks (truncation) award three marks for the correct answer given to 2sf without working	

(**QU06b 1SC0/1PH, June 2024**)