

Name of the Student: _____

Max. Marks : 18 Marks

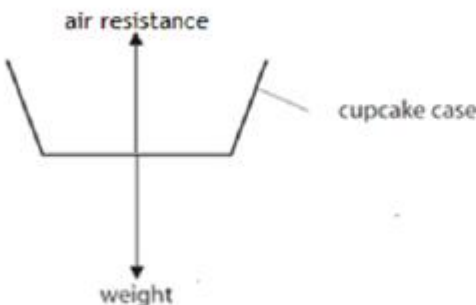
Time : 18 Minutes

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	A description to include any 4 from: measure height (1) measure time of fall (1) use (average) $\text{speed} = \text{distance} \div \text{time}$ (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) $(W=)0.005 \times 10$ 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

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

Q3.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) $371 = (64.5 + m) \times 3.5$ rearrangement (1) $m + 64.5 = 371 / 3.5$ evaluation of total mass (1) $m + 64.5 = 106 \text{ (kg)}$ evaluation of woman's mass (1) $m = 106 - 64.5$ $= 41.5 \text{ (kg)}$	 full marks will be awarded for correct numerical answer without working	(4)
Question number	Answer	Additional guidance	Mark
(ii)	substitution (1) $KE = \frac{1}{2} \times 64.5 \times 3.5^2$ 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)