

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i) CS4	attempt to use correct data from graph or equation (1) substitution (1) $(a =) \frac{26 - 14}{34}$ evaluation to 2 sf (1) $0.35 \text{ (m/s}^2\text{)}$	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) A02

Question number	Answer	Additional guidance	Mark
(ii) CS4	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 b(i) award full marks for correct answer without working award 1 mark for final answer 408 (m)	(3) A02

Q2.

	Answer	Additional guidance	Mark
	correct data point(s) seen (1) (accel =) $\frac{\Delta v}{t}$ (1) evaluation (1) 2.9 (m/s²)	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/s²) (e.g. 2.857...) award full marks for the correct answer without working	(3) AO3

	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 $(F=) \frac{(1.125) + (0.615)}{0.012}$ 145 (N) scores 3 marks 145 (N) to any other power of ten scores 2 marks maximum	(3)

		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	
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	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

Q4.

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) $(a = \frac{v - u}{t}) \quad 3.0 = \frac{24 - 7.6}{t}$ 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. $15.8 = 86(.37) / \text{time}$ $(t =) 86(.37) / 15.8$ 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)