Name of the Student:_____

Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	substitution and rearrangement (1) (force = $\frac{\text{moment}}{\text{distance}}$) = $\frac{0.6}{3(\times 10^{-1})}$ evaluation (1) 2(.0) (N)	 reject 0.6 x 3 = 1.8 award full marks for the correct answer without working ignore significant figures 2(.0) to any other power of ten scores 1 mark maximum	**(2)** **AO2.1**

Downloaded from www.merit-minds.com

Question number	Answer	Additional guidance	Mark
(ii)	correct calculation of one moment (1) correct calculation of second moment and adding of moments seen (1)	**show that** question either 2x0.1 or 1x0.5 seen 2(.0)x0.1(0) + 1(.0)x0.5 scores 2 marks 0.2+0.5 scores 2 marks accept calculations in alternative units (e.g. N cm) if correct conversion(s) seen if no other marks scored, the addition of two other moments can score 1 mark maximum	(2) **AO2.1**

Question number	Answer	Additional guidance	Mark
(iii)	explanation linking **three** from: **{sum** of / **total }** clockwise moments = **{sum** of / **total }** anticlockwise moments (1) for a system in equilibrium / balance (1) clockwise and anticlockwise moments compared (1) **so** rod not in equilibrium (1)	 about the same point / about a point e.g. clockwise moment > anticlockwise moment or reverse argument 0.7 > 0.6 0.7 ≠ 0.6 rod will **rotate clockwise** MP4 can only be scored if MP3 awarded	(3) **AO3.2**

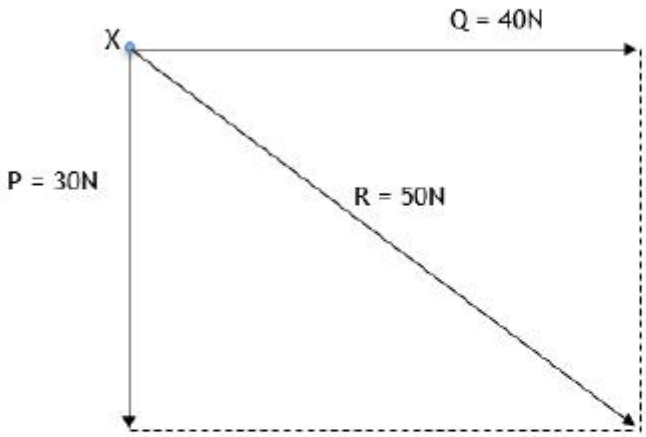
Downloaded from www.merit-minds.com

Q2.

Question Number:	Answer	Additional Guidance	Mark
	recall clockwise moment = anticlockwise moment (1) moment = force x (perpendicular) distance (1) substitution (1) $m \times 17 = (6 \times 15) + (4.6 \times 10)$ rearrangement and evaluation (1) m = 8.0 (g)	calculations need not include g (which cancels out from all terms) substitution and rearrangement in either order $m \times 17 = 90+46$ $m = \frac{(6\times15)+(4.6\times10)}{17}$ $m = 136/17$ award full marks for correct answer without working	**(4)** AO 1 1 AO 2 1

Downloaded from www.merit-minds.com

Q3.

Question number	Answer	Additional guidance	Mark
		independent marks	**(2)** **A01**
	arrow (any length) (labelled R) in correct direction (judge by eye) (1)		
		construction lines need not be shown arrow head must be present for MP1	
	(size of R =) 50N (1)	accept answers in range 48N to 52N obtained from scale drawing working need not be shown	

Downloaded from www.merit-minds.com

Q4.

Question number	Answer	Additional guidance	Mark
(i)	Recall GPE = m x g x Δh (1) Substitution = 400 x 9.8 x 1.5 (1) Evaluation = 5900 (J) (1) (which is nearly 6000 J)	 accept 5880 (J)	(3)

Question number	Answer	Additional guidance	Mark
(ii)	An explanation that combines identification – knowledge (1 mark) and reasoning (1 mark) • energy is dissipated/scattered (1) • into the surroundings (1)	 energy from a loss of ball's PE / its gain in KE ends up as (kinetic) energy of molecules (of ball / wall / air)	(2)

Question number	Answer	Mark
(iii)	**B** velocity	(1)

Downloaded from www.merit-minds.com