A-Level Physics: **w25 11**

Multiple Choice Answers

Q14: C

A-Level Physics: **w25 12**

Multiple Choice Answers

Q13: A

A-Level Physics: **w25 14**

Multiple Choice Answers

Q14: C

A-Level Physics: **w25 24**

2(a)	product of force and distance
	perpendicular distance between the (line of action of the two) forces
2(b)	straight vertical line drawn from centre to bottom corner
2(c)(i)	centre of gravity is to the right of the rod so torque is anticlockwise **or** moment of weight of sheet about rod is clockwise so torque is anticlockwise
2(c)(ii)	(horizontal displacement) = $3.3 / (2.8 \times 9.81) = 0.12$ (m)
2(d)	$\rho = m / V$
	$V = 4.0 \times 10^{-3} \times$ (side length)^2
	side length = $\sqrt{\left[2.8 / (3000 \times 0.0040)\right]} = 0.48\,\text{m}$
2(e)	point lies on a straight line at 45° to the horizontal from the bottom-right corner to the edge of the rod
	point lies on a vertical line half-way between rod and right-hand edge

A-Level Physics: **s25 11**

Multiple Choice Answers

Q13: B

A-Level Physics: **s25 12**

Multiple Choice Answers

Q15: A

Q17: B

A-Level Physics: **s25 13**

Multiple Choice Answers

Q12: D

A-Level Physics: **s25 14**

Multiple Choice Answers

Q10: B

2(a)	force × <u>perpendicular</u> distance (of line of action of force to / from the point)
2(b)(i)	(moment due to weight =) $1.2 \times 270 \times 9.81$
	(moment due to post =) $1800 \times (1.6 / \cos\theta)$
	$1.2 \times 270 \times 9.81 = 1800 \times (1.6 / \cos\theta)$ so $\theta = 25(°)$ or $1.2 \times 270 \times 9.81 - 1800 \times (1.6 / \cos\theta) = 0$ so $\theta = 25(°)$
2(b)(ii)	A closed tip-to-tail vector triangle
	vector labelled *F* at an angle of 25° ± 3° anticlockwise from vertical **and** vector labelled *R* at an angle of 37° ± 3° clockwise from vertical
2(b)(iii)	$A = F / p$ $= 1800 / (150 \times 10^3)$
	$= 0.012\ m^2$

2(a)	force × <u>perpendicular</u> distance (of line of action of force to / from the point)
2(b)(i)	$150 \times 9.81 \times 4.5$ **or** $90 \times 9.81 \times 4.5$ **or** $3.0 \times 9.81 \times m$
	$(150 \times 9.81 \times 4.5) = (90 \times 9.81 \times 4.5) + (3.0 \times 9.81 \times m)$
	$m = 90$ kg
2(b)(ii)	Young modulus = σ / ε **or** $F / A\varepsilon$ **or** FL / Ax
	Area of wire = $\pi \times (1.8 \times 10^{-3} / 2)^2$ $= 2.5 \times 10^{-6}$
	So Young modulus = $((90 \times 9.81) / \pi \times (9.0 \times 10^{-4})^2) / 1.2 \times 10^{-3}$ $= 2.9 \times 10^{11}$ Pa
2(b)(iii)	Moment provided by B will decrease / moment due to wire will increase
	So force acting on wire will increase (Young's modulus and area remain constant) and the strain will increase