

Multiple Choice Answers

Q13: B

Multiple Choice Answers

Q14: C

Multiple Choice Answers

Q13: D

Q15: C

3(a)	an arrow horizontally on the page to the left labelled F
	two arrows horizontally on the page to the right each labelled T
3(b)(i)	$T = 110 / 2$ $= 55 \text{ N}$
3(b)(ii)	$x = F / k$ $= 110 / 250$ $= 0.44 \text{ m}$
3(c)(i)	extension = $55 / 250$ or $110 / (2 \times 250)$
	extension = 0.22 m
3(c)(ii)	$E = \frac{1}{2} Fx$ or $E = \frac{1}{2} kx^2$ or $E = \frac{1}{2} F^2 / k$
	$E_1 / E_2 = (\frac{1}{2} \times 110 \times 0.44) / (2 \times (\frac{1}{2} \times 55 \times 10.22))$ or $E_1 / E_2 = (\frac{1}{2} k \times 0.44^2) / (2 \times (\frac{1}{2} k \times 0.22^2))$ or $E_1 / E_2 = (\frac{1}{2} \times 110^2 / k) / (2 \times (\frac{1}{2} \times 55^2 / k))$ $E_1 / E_2 = 2.0$ (no ECF from 3(b)(ii) and 3(c)(i))

Multiple Choice Answers

Q15: B

Multiple Choice Answers

Q10: B

Q14: C

Multiple Choice Answers

Q11: D

Multiple Choice Answers

Q9: A

Q11: C

2(a)	in (rotational) equilibrium
	<u>sum / total</u> of CW moments about a point = <u>sum / total</u> of ACW moments about the (same) point.
2(b)(i)	The magnitudes of the moments about A are: (1700 × 3.0) (660 x) (1300 × 5)
	Correct magnitude of any one moment about A.
	Correct magnitudes of a second moment about A.
	(1700 × 3.0) + (660 x) = (1300 × 5) x = 2.1 m
2(b)(ii)	(Upthrust =) 11 × 9.81 + 1300 = 1400 (N)
2(b)(iii)	y = Upthrust / ρgA
	= 1400 / (990 × 9.81 × π × (0.78 / 2) ²)
	= 0.30 m
	OR [P = F / A = 1400 / π × (0.78 / 2) ² = 2930] y = P / ρg = 2930 / (990 × 9.81)
	= 0.30 m
2(b)(iv)	line with a non-zero value of depth at distance = 0
	A line from distance = 0 to distance = 6.0 m with a gradient that is always positive