Question			answer	Marks	Guidance
1			Lines joining density to 'kg m^{-3}' pressure to 'kg m^{-1} s^{-2}' power to 'kg m^{2} s^{-3}'	B1 ×2	**Note**: All correct – 2 marks, deduct 1 mark for each error or omission. (Minimum score = 0)
			Total	**2**	

Question			Answer	Marks	Guidance
2	(a)		A vector quantity has direction / scalar quantity does not have direction	B1	**Not**: 'Scalar only has magnitude' because there is no mention of direction
	(b)	(	acceleration	B1	
		(ii)	power and energy	B1	
		(iii)	stress and pressure unit: pascal / Pa / N m^{-2} / kg m^{-1} s^{-2}	M1 A1	 **Note**: The A1 mark can only be scored if M1 is awarded
	(c)		10^{12}	B1	
	(d)		*p μ c k*	B1	
			Total	**7**	

3	Expected Answers	Marks	Additional Guidance
a	work done $\rightarrow$ N m stress $\rightarrow$ N m^{-2} density $\rightarrow$ kg m^{-3}	B2	**Allow** 2 marks if all correct **Allow** 1 mark if one or two responses are correct
b(i)	weight / gravitational force	B1	**Not** 'gravity'
b(ii)	(force =) 4.8×9.81 (= 47.1 N) pressure = $\frac{4.8 \times 9.81}{0.085 \times 0.085}$ pressure = 6.52×10^3 (Pa)	C1 A1	**Note:** 2 marks for bald 2 sf answer of 6.5×10^3 (Pa) **Allow** 1 mark for '$48/0.085^2 = 6.64 \times 10^3$'; *g* taken as 10 (N kg^{-1}) **Allow** 1 mark for '$4.8 \times 9.81/8.5^2 = 0.65$' **Not '**mass/area' since it is 'wrong physics'.
b(iii)	8 4 2	B1 B1 B1	 This must be consistent with the values for mass and cross-sectional area.
	Total	**8**	

Question			Answer	Marks	Guidance
4	(a)		N m^{-2} or N/m^2 or Pa m s^{-2} or m/s^2 or (kg) m s^{-2} 1000	B2	**Allow** any prefix given **Allow**: 2 marks if all three correct; 1 mark if one is correct or two are correct
	(b)		(volume =) 82 - 75 (cm^3) or 7 (cm^3) density = $\frac{1.6\times10^{-2}}{7\times10^{-6}}$ density = 2.3×10^3 (kg m^{-3})	C1 A1	**Allow**: 1 mark for 2.3×10^n, $n \neq 3$
			Total	**4**	