Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) (p) = 1000 x 10 x 0.200 evaluation of pressure difference (1) 2000 final evaluation (1) 103000 (Pa)	accept e.c.f for addition of atmospheric pressure seen for 1mark award 1 mark for selecting correct equation if no other mark awarded award full marks for correct answer without working.	(3)

Question number	Answer	Additional guidance	Mark
(ii)	an explanation linking use of $P = h \times \rho \times g$ (1) no area in the equation (1)	P /pressure, ρ /density (and g /gravitational field strength) are constant/the same Area does not affect result h /height of water is independent of area P, ρ, and g are all constant gains 2 marks	(2)

Q2.

Question number	Answer	Additional guidance	Mark
	recall and use of $P = \frac{F}{A}$ (1) evaluation (1) = 450 (Pa)	$P = \frac{0.15 \times 10}{3.3 (\times 10^{-3})}$ 454 (Pa)	**(2)**

Q3.

Question number	Answer	Additional guidance	Mark
	recall and substitution (1) $0.5 = k \times 13 (\times 10^{-3})$ rearrangement (1) $\frac{0.5}{13(\times 10^{-3})}$ evaluation (1) 38 (N/m)	 $k = \frac{F}{x}$ allow 38.5 (N/m) or 38.46 (N/m) or 39 (N/m) 0.04/0.038 (N/m) gains 2 marks 2958 (N/m) gains 1 mark (x^2 used in equation) award full marks for the correct answer without working	**(3)**

Q4.

Question Number	Answer	Additional guidance	Mark
(i)	recall (1) (P =) $\frac{E}{t}$ substitution and evaluation (1) (P=) 75 (W)	P = work done ÷ time P = $\frac{45}{0.6}$ award full marks for the correct answer without working	(2)

Question Number	Answer	Additional guidance	Mark
(ii)	substitution into E = $\frac{1}{2} \times k \times x^2$ (1) $45 = \frac{1}{2} \times 140 \times x^2$ rearrangement (1) $(x =) \sqrt{\frac{2 \times 45}{140}}$ evaluation (1) 0.8(0) (m)	allow substitution and rearrangement in either order $x^2 = (\frac{E}{0.5k} =) \frac{2 \times 45}{140}$ $x^2 = 0.64(28571)$ accept values that round to 0.80 e.g. 0.80178 award full marks for the correct answer without working	(3)

Q5.

Question number	Answer	Mark
(i)	pressure = force ÷ area	(1)

Question number	Answer	Additional guidance	Mark
(ii)	rearrangement (1) $(F =) P \times A$ calculation of area (1) $2.4 \times 1.5 = 3.6$ substitution (1) $(F =) 12\,000 \times 3.6$ answer (1) 43 200 (N)	award full marks for correct numerical answer without working maximum 3 marks if kPa not converted to Pa	(4)