Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
i	substitution (1) (E =) ½ X 20 x $0.09^{(2)}$ evaluation (1) 0.08(1) (J)	 allow 1 mark for ½ x 20 x 9^2 or answer of 810 (J) or answer of 90 (J) award full marks for the correct answer without working	**(2)**

Question number	Answer	Additional guidance	Mark
ii	a description including mention of one relevant energy store (1) correct transfer in context (1)	 potential/ PE/ kinetic/ KE/ thermal/ heat/ elastic potential energy stored in the spring transferred to kinetic energy of the ball/rod scores 2 marks kinetic energy of rod is transferred to kinetic energy of ball scores 2 marks idea of energy transferred to the surroundings/ thermal scores 2 marks	(2)

Question number	Answer	Additional guidance	Mark
iii	an explanation linking two from (controls the maximum) extension (1) idea of keeping below the elastic limit (1) (which would result in) spring being permanently stretched (1)	ignore <u>damaging</u> the spring (given in stem) stretch prevents spring being over-stretched / extended too far scores 2 marks allow distorted/ break	(2)

Q2.

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

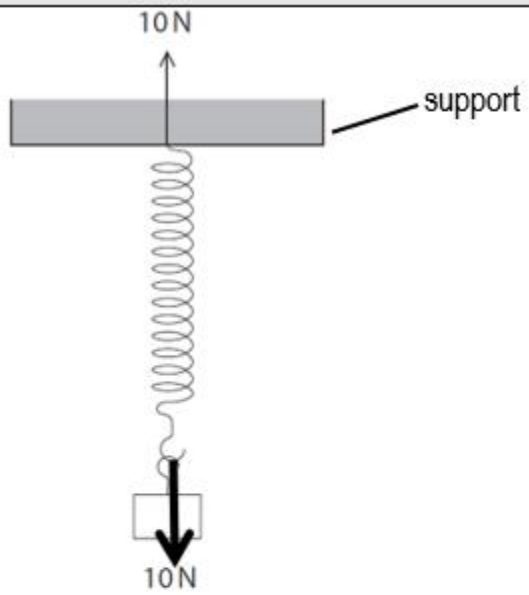
Question number	Answer	Additional guidance	Mark
(ii)	rearrangement (1) $(F =) P \times A$ calculation of area (1) $2.4 \times 1.5 = 3.6$ substitution (1) $(F =) 12\,000 \times 3.6$ answer (1) 43 200 (N)	award full marks for correct numerical answer without working maximum 3 marks if kPa not converted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

Question number	Answer	Mark
(iii)	B	(1)

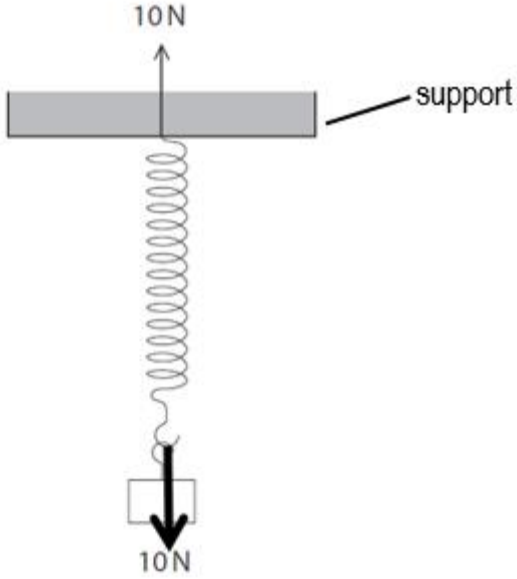
Q3.

Question number	Answer	Additional guidance	Mark
	any two from pressure(s) would be greater (values) (1) steeper gradient of graph (1) both straight lines (1) intercept (on pressure axis) the same (1)	**credit mark points seen on graph** bigger gradient / steeper line (of best fit) both linear pressure at surface is the same	**(2)** **AO3**

Q4.

Question Number	Answer	Additional guidance	Mark
			**(2)**
	downwards arrow (1)	Anywhere below the support	
	Plus any one from:		
	the same length as top arrow (1)	Judge by eye	
	from the bottom of the spring or from the weight (1)	Judge by eye	

Q5.

Question Number	Answer	Additional guidance	Mark
			(2)
	downwards arrow (1)	Anywhere below the support	
	Plus any one from:		
	the same length as top arrow (1)	Judge by eye	
	from the bottom of the spring or from the weight (1)	Judge by eye	