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

Mark Schemes

Q1.

Question Number	Answer	Mark
	B $0.5 \times 0.15 \times 2.5$ $E = \frac{1}{2} F \Delta x$	1
	A - incorrect calculation C – incorrect calculation D – incorrect calculation	

Q2.

Question Number	Answer	Mark
	B	1

Q3.

Question Number	Acceptable answers	Additional guidance	Mark
	The only correct answer is B because the gradient of this graph is change in length ÷ change in force and the change in length is the same as the change in extension, so the gradient is equal to stiffness A is not correct because a graph of extension against force will have a gradient of $1/k$ C is not correct because a graph of stress against strain will have a gradient equal to the Young modulus for the sample D is not correct because a graph of strain versus length is equivalent to a graph of extension versus $(\text{length})^2$, so it does not have a gradient equal to k		1

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Q4.

Question Number	Acceptable Answers	Additional Guidance	Mark
	B		1

Q5.

Question Number	Answer	Mark
	C The stress beyond which the steel becomes permanently deformed.	1
	Incorrect Answers: A – The stress at which the steel undergoes an increase in strain with no increase in stress. B – The stress beyond which the stress and strain are no longer proportional. D – The stress at which the steel breaks.	

Q6.

Question Number	Acceptable answer	Additional guidance	Mark
	C	The only correct answer is C because for the original spring $F = kx$ so $x = F/k$, so $E = ½ Fx = ½ F^2/k$. For $2F$ and $2k$ the epe is $E \times 2^2 / 2 = 2E$ A is not correct because it is $E/2$ B is not correct because it is E A is not correct because it is $8E$	1

Q7.

Question Number	Answer	Mark
	The only correct answer is C because each spring is extended by the same amount so each stores the same energy so the total is doubled	1

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Q8.

Question Number	Answer	Mark
	B	1

Q9.

Question Number	Answer	Mark
	C $\frac{1}{2}mg\Delta x$	1
	Incorrect Answers: A – no factor of $\frac{1}{2}$ B – incorrect equation and no factor of $\frac{1}{2}$ D – incorrect equation	

Q10.

Question Number	Answer	Mark
	The only correct answer is B **A** *is not correct because* this is missing *g* **C** *is not correct because* this is an incorrect arrangement **D** *is not correct because* this is an incorrect arrangement	1

Q11.

Question Number	Acceptable answers	Additional guidance	Mark
	B		1

Q12.

Question Number	Answer	Mark
	B	1

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Q13.

Question Number	Answer	Mark
	C	1

Q14.

Question Number	Answer	Mark
	D larger ball bearing in liquid with lower viscosity	1
	Incorrect Answers: **A** smaller ball bearing in higher viscosity will fall most slowly **B** ball bearing in higher viscosity will fall the more slowly than in lower viscosity **C** smaller ball bearing will fall more slowly than a larger ball bearing	

Q15.

Question Number	Answer	Mark
	D	1

Q16.

Question Number	Answer	Mark
	A	1

Q17.

Question Number	Acceptable Answers	Reject	Mark
	C		1

Q18.

Question Number	Answer	Mark
	A kg s^{-2}	1
	Incorrect Answers: B – base units for N C – incorrect units and not base units D – correct units but not base units	

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Q19.

Question Number	Answer	Additional guidance	Mark
	C	(elastic strain energy in the wire.)	**(1)**

Q20.

Question Number	Answers	Additional Guidance	Mark
	A	5 cm	**(1)**

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