Edexcel Physics – 9PH0

Module 13: Oscillations

You should be able to demonstrate and show your understanding of:	Progress and understanding:			
	1	2	3	4
Oscillations				
The condition for simple harmonic motion: $$F = -kx$$ and understand how to identify a situation where simple harmonic motion occurs				
The equations: $$a = -\omega^2 x \quad x = A\cos\omega t \quad v = -A\omega\sin\omega t \quad a = -A\omega^2\cos\omega t$$ as well as: $$T = \frac{1}{f} = \frac{2\pi}{\omega} \qquad \omega = 2\pi f$$				
The equations: $$T = 2\pi\sqrt{\frac{m}{k}}$$ for a **simple harmonic oscillator**, as well as: $$T = 2\pi\sqrt{\frac{l}{g}}$$ for a **simple pendulum**				
Displacement/time and velocity/time graphs for an object oscillating and know that the gradient gives the instantaneous velocity (d/t) or acceleration (v/t)				
The term **resonance**				
CORE PRACTICAL 16: Determine the value of an unknown mass using the resonant frequencies of the oscillation of known masses				
How to apply conservation of energy to damped and undamped oscillating systems				
The distinction between free and forced oscillations				

You should be able to demonstrate and show your understanding of:	Progress and understanding:			
	1	2	3	4
How the amplitude of a forced oscillation changes at and around the natural frequency of a system and know, qualitatively, how damping affects resonance				
How damping and the plastic deformation of ductile materials reduce the amplitude of oscillation.				