Part one – equation recall	Equation	Units
1. Defining equation for speed		
2. Defining equation for acceleration		
3. If you know the mass, how do you work out the weight?		
4. Equation for density		
5. Newton's 2nd law, which links force and acceleration		
6. Equation for Hooke's law for springs		
7. Equation to calculate out the moment of a force		
8. Equation for work done		
9. Equation for kinetic energy		
10. Equation for potential energy		
11. Equation for power		
12. General equation for efficiency		---
13. Defining equation for pressure		
14. Equation for pressure in a liquid		
15. Defining equation for specific heat capacity		
16. Defining equation for latent heat capacity		
17. Wave speed equation		
18. Defining equation for refractive index		---
19. Defining equation for Current		
20. Defining equation for Resistance		
21. Combine resistance of three resistors all in…..	Series	Parallel
22. Electrical Power		
23. Electrical Energy		
24. Transformer coils and voltage ratio		---
25. Relationship between frequency and time period		
26. Relationship between refractive index and angle for a wave entering a medium		---
27. Relationship between refractive index and angle for a wave leaving a medium		---
28. Relationship between refractive index and critical angle for a wave attempting to leave a medium		---

Part two – equation use:

1. In an ideal transformer the input voltage is 240V. There are 20 times more coils on the input side compared to the output side of the transformer.

    a. Calculate the output voltage
    b. The input current is 0.1A. Calculate the output current.
2. 30 Joules of energy is transferred by a Battery when it produces 1A for 20 seconds. What is the e.m.f of the battery?
3. You have a 10 Ohm and a 15 Ohm resistor.
    a. What combined resistances can they have in parallel, in series?
    b. Calculate the current that would flow if the 15 Ohm resistor is connected to a 1.5 V battery
4. If a battery can deliver 360 coulombs of charge how long can it be used to run a device that has a normal operating current of 0.1 Amps?
5. If a device is labelled 2400W, 230V what fuse might be used in the plug?
6. Light entering a medium of refractive index 1.35 at an angle of incidence 45 degrees will refract by how many degrees?
   n = sin(i) / sin(r)
7. What is the critical angle for a material with a refractive index of 1.4?
   sin (c) = 1/n
8. A wave of wavelength 33m has a time period of 0.1s. What is its speed?
9. Work is done whenever energy is transferred. Calculate the work done / energy transfer in the following situations.
    a. A 50N horizontal force is used to drag a bag 10m across a floor.
    b. A 40kg mass is lifted by 5m.
    c. A 40kg mass falls and reaches a speed of 10m/s. (how far did it fall?)
10. If a pump pumps water to the top of a hill and uses 5000J of electrical energy.
    a. If the pump is 75% efficient how much energy has the water gained?
    b. How much waste energy is dispersed into the surroundings?

    The hill is 30m above the pump and the density of water is 1000kg/m^3
    c. How much pressure is there due to the water at the pump?
    d. What must be added to get the total pressure at the pump?
11. Ethanol boils at 351K. Is this above or below the boiling point of water?
12. The SHC of water is 4.2 kJ/kgK. What does this mean?
13. If the latent heat of fusion of vaporization of water is 2260 kJ/kg how much energy is needed to evaporate 10g of water?
14. If a cylinder of gas had a volume of 20cm^3 is compressed to a 5cm^3 what has happened to its pressure?
15. Copper has a density of about 9000 kg/m^3 and is worth £4 per kilo scrap value. How much will a cube of side 10cm be worth?
16. A 5kg toy car travelling at 6m/s has a thrust of 30N and friction equalling 5N acting on it for 2 seconds.
    a. How fast will it accelerate during the two seconds?
    b. How fast will it be travelling at the end of the two seconds?
    c. How far will it have travelled in the 2 seconds?
17. A spring is used to lift one end of a 10kg plank. The spring stretches by 4cm.
    a. What is the weight of the plank?
    b. If the plank is uniform where is its centre of mass?
    c. If the plank is 1m long how much moment is the weight generating?
    d. How much force must the spring be lifting the plank with?
    e. What is the spring constant of the spring?