Revision 1 QUESTIONS

# Topic 1: Linear Motion and Forces

1. State Newton’s First Law.
2. Explain the concept of Inertia.
3. Explain the difference between mass and weight.
4. Explain the motion of a skydiver jumping from an aircraft, describing the forces acting upon him and his rate of descent.
5. Calculate the force acting upon a 80kg skydiver at the start of his fall.
6. Determine the force acting at terminal velocity.
7. Calculate the acceleration of a 924kg car with 522N acting upon it.
8. Calculate the mass of a crash test dummy accelerating at 3.2m/s/s with 150N acting upon it.

# Topic 2: Electric Circuits

1. State what is meant by “electron current” and ”conventional current”.
2. A radio draws a current of 0.65 A.

Calculate the charge that flows in 7 minutes of operation.

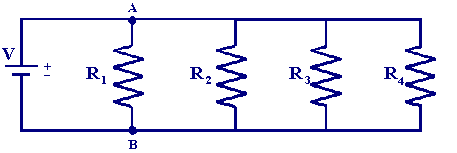
1. Consider 1050 C of charge flows through a lamp in 7 minutes.
   1. Calculate the magnitude of electric current flowing through the lamp.
   2. Determine the number of electrons (q = 1.6x10-19 C) that flow through the lamp if it is left on for 6 hours. Assume the magnitude of current is constant during this time.
2. State the types of forces (e.g. repel, attract) between particles of both like and opposite charges.
3. Describe how fuses and circuit breakers work, and explain how safety is increased by using them.
4. State what happens to the voltage and current when measured on a parallel circuit?
5. State what happens to the voltage and current when measured on a series circuit?
6. Explain three factors that can change the resistance of a conductor?
7. Calculate the total resistance across the circuit below?

V1 =3V

2A

V3 =3V

V2 =3V

1. Calculate the total resistance of the circuit below?  
   

I1 0.2mA

I2 0.2mA

I3 0.2mA

I4 0.2mA

12 V

# Topic 3: Heat

1. State the difference between heat and temperature.
2. Describe thermal equilibrium.
3. Define thermal energy.
4. State the three most common units of measurement for temperature.
5. For the three objects below, thermal equilibrium is achieved with object A and B, and thermal equilibrium is achieved with object B and C. Describe the connection between object A, and object C.

A

B

C

1. Define absolute zero.
2. What is the link between temperature, vibrating particles, and thermal energy?
3. Draw a diagram of a convection current coming from a heater.
4. Define the term *conduction* and give an example of conduction in everyday life.
5. Describe how thermal radiation occurs from the sun to the Earth.
6. What causes thermal expansion?
7. Give three examples of thermal expansion.
8. Would power lines sag on a hot or cold day? Explain.
9. Why is there white paint on the side of expansion joints of train lines? What would happen if black paint was used?
10. Draw a diagram that has all three types of heat transfer on it.
11. Explain what happens to the particles in a material when it is heated.
12. What will expand more, a liquid or a solid? Why?
13. Define the term ‘specific heat capacity’.
14. 150mL of 230C water is placed in a kettle and boiled.

If the boiling point of water is 1000C and 48279 J was used in the boiling process, calculate the specific heat capacity of water.

1. A certain object requires 12kJ of heat to increase its temperature by 72oC

Calculate the mass of the object if it has a specific heat capacity of 326 J.Kg-1.oC-1

1. Aluminium has a specific heat capacity of 904 J.Kg-1.oC-1

Calculate the quantity of heat transferred in order to raise 15g of aluminium to melting point (660.3oC) from room temperature (230C)

1. Explain the different effect a high specific heat capacity will have in comparison to a low specific heat capacity