**3rd term topics practice exam**

1. **State** the definition of oxidation and reduction.
2. **State** the oxidation numbers on the following species: HNO3, MnO42-, O2.
3. **Sketch** a position-time graph for a stationary, URM and UARM body.
4. A bank robber passes a police patrol car at a constant velocity 72 km/h. The patrol car sets off immediately with an acceleration of 3 m/s2. **Calculate** how long will it take to catch up with the bank robber?
5. Convert the following units: 100000 N/m2🡪 N/mm2, 40 m/s 🡪 km/h, 20000 cm3 🡪 m3.
6. The following graph shows a velocity-time graph for a journey. **State** the 3 parts of the journey that show an acceleration. **State** which part is the fastest acceleration and **calculate** the value for it.



1. **Label** friction, normal and gravity forces on this diagram.



1. The surface area of the piston on the left, Aleft, is 0.1 m2 and an object of mass, 100 kg is place on top. If an object of mass of 400 kg is placed on the piston on the right, **calculate** the minimum surface area required for A2, if the object is to be lifted.
2. A submarine is built to withstand 3028200 Pa. **Calculate** the maximum depth that it could go under the surface of the ocean. ***Data****: dsea water=1.03 g/cm3*.
3. After playing on a trampoline a young child touches the metal rim and receives an electric shock. **Explain**, in terms of static electricity, what happened.
4. A pile of forty 2 kgbricks was lifted by a crane from the 3rd storey of a building to the 8th storey. Calculate the increase in gravitational potential energy. *Data: Height of each storey = 3 m.*
5. The use of biomass (plants grown to burn as fuels) is one example of a renewable energy source. **Explain** why it is considered “renewable” and **explain** 2 negative consequences of its use as a fuel.