**MID TERM 2 EXAMS**

**FORM 3 PHYSICS**

**TIME: 1 ½ HOURS**

**NAME…………….…………………………………..……..ADM…………...CLASS………………….**

1. a) Define surface tension?(1mk)

b) The diagram below shows drop of liquids X and Y carefully put on a clean flat glass slab

**Glass slab**

**X**

**Y**

 Explain the shapes of the drops (2mks)

1. An empty density bottle has a mass of 50g. Its mass is 100g when filled with water and 120g when filled with liquid K. Calculate the density of liquid K in SI units. (3mks)

3. A block measuring 20cm by 10cm by 4cm rests on a flat surface. The block has a weight of 6N. Determine:

 i) The minimum pressure it exerts on the surface. (2mks)

 ii) The maximum pressure it exerts(2mks)

c) The barometric height of a certain town is 65cmHg. Given that the standard atmospheric pressure is 76cmHg and the density of mercury is 13600kg/m3 , determine the altitude of the town. (Take density of air = 1.25kg/m3 (3mks)

1. a) The figure below shows a uniform metal rod balanced at the centre by different forces.

**40cm**

**T**

**35cm**

**8N**

**4N**

**10cm**

Determine the value of T. (3mk)

1. Explain why a lorry loaded with bags of maize packed high up is likely topple over when negotiating a corner. (2mks)
2. Figure below shows a tape made from a ticker tape timer running at 50Hz.

**5cm**

**15cm**

**A**

**B**

**C**

**D**

**E**

Find,

 i) The time taken for one tick interval (1mk)

 ii) Velocities between points AB and DE (3mk)

 iii) Acceleration of the body over interval AE (2mk)

1. a)Distinguish between reflection and refraction of light (1mk)
2. State the two laws of refraction of light(2mk)
3. The refractive indices of water and glass are 4/3 and 3/2 respectively. Determine the refractive index of a ray of light moving from water to glass. (3mks)
4. A ray of light makes a glancing angle of incidence i = 60o with a flat glass surface as shown in figure

**Air**

**i**

**r**

**Glass**

Given that the critical angle for glass is 42o determine;

 (i) The refractive index of glass (2mks)

(ii) The angle of refraction r (2mks)

(iii) Given that the speed of light in air 3.0 x 108 m/s, find the speed of light in glass (2mks)

1. The graph shown below shows, the apparent depth (y-axis) against real depth. Use it to calculate the refractive index of glass. (3mks)

**Real depth (cm)**

**0**

**10**

**20**

**30**

**40**

**5**

**10**

**15**

**20**

**Apparent depth (cm)**

1. a) Define the term inertia (1mk)

 b) The figure below shows a smooth card placed on the open end of a car. A coin is placed on the card. When the card is horizontally pulled away suddenly, the coin drops in the can.

**Coin**

**Can**

**Cardboard**

Explain this observation.(2mks)

1. A car of mass 800 kg is initially moving at 25 m/s. Calculate the force needed to bring the car to rest over a distance of 20 m.(3mks)
2. A bullet of mass 0.006kg is fired from a gun of mass 0.5kg. If the muzzle velocity of the bullet is 300m/s. calculate the recoil velocity of the gun.( 3mks)
3. State two forms of energy (2mks)