**NAME:…………………………………………..CLASS…….……ADM NO:……….…….**

**PHYSICS FORM 2**

**INSTRUCTIONS TO STUDENTS**

* *This paper consists of 20 questions.*
* *Answer ALL the questions in the spaces provided.*
* *ALL working MUST be clearly shown.*
* *ALL numerical answers MUST be expressed in decimal forms.*

***Answer all the questions in the provided space***

 **SECTION A (30 MARKS)**

1. The diagram below shows a micrometer screw gauge. What is the reading in SI units? (2mks)

 

1. In an experiment to estimate the height of the following measurement were obtained. Length of the shadow of the metre rule = 120cm (3mks)

 Length of the shadows of the tree = 20m

 Length of the shadow of the rod= 1m

 Estimate the height of the tree

1. The water level in a burette is 27cm3. If 88 drops of water fall from the burette and the average volume of one drop is 0.25cm3. What is the final water level in the burette? (2mks)
2. a) State three precautions that must be taken when using the density bottle. (3mks)

b) The mass of an empty density bottle of volume 25cm3 is 10g. Iron fillings are poured into

the bottle and the total mass is 35g. Water of density 1g/cm3 is added into the filling until the bottle is full. If the total mass of the bottle and its contents is 50g. Calculate the density of iron fillings. (3mks)

1. a) Name 3 types of forces that act without contact (3mks)

b) Explain why drops of filling water are approximately spherical (2mks)

 (c) A girl standing 600m away from a cliff bangs two pieces of wood together

 and hears an echo 3.5 seconds later. Determine the speed of sound in air at that place .(3mrks)

6. (a) Define a resultant vector (1mk)

b) Find the resultant of a force of 5N and 3N acting at the same point on an object in opposite

 direction and in a straight line (2mks)

c) The moons gravitational pull is 1/6 of the earth’s gravitational pull. Calculate the weight

 of a body whose mass is 60kg on the moon’s surface given that the earth’s gravitational

 pull is 10N/Kg (3mks)

d) A spring stretches by 5cm when supporting a load of 20N. By how much would it stretch

 when supporting a load 5kg? (3mks)

**SECTION B (40 MARKS)**

1. a) The figure below shows a section of a flexible wire carrying current perpendicularly out of the paper.

 

The wire moves in the direction shown as current passes through it.

1. Label the polarities of the magnets A and B. ( 2mks)
2. Explain the behaviour of the flexible wire. (2mks)

 b) The diagram below shows a simple electric motor.

 

 i) Name the part labeled C and P (2mks)

 ii) State three factors that will affect the speed of rotation of the motor. (3mks)

1. the figure below shows an electromagnetic relay being used to switch an electric motor on and off. The electromagnet consists of a coil of wire wrapped around a core. The motor in figure is switched off.

Motor

Springy metal strips

Contacts

Soft iron armature

Core

S

A

B

Pivot

Insulator

1. Suggest suitable material for the core. (1mk)
2. What happens to the core when switch S is closed? (2mks)
3. Why do the contacts A and B close when the switch S is closed. (2mks)
4. When the switch S is opened, what will happen to;
5. The core (1mk)
6. Soft iron armature. (1mk)
7. Give **one** other application of an electromagnet. (1mk)
8. State **two** ways in which an electromagnet could be made more powerful. (2mks)
9. Figure 5 below shows how the displacement varies for a certain wave.



1. What is the amplitude of the wave? (1mk)
2. What is the periodic time of the wave? (1mk)
3. Determine the frequency of the wave (2mks)
4. Given that the speed of the wave is 20m/s, calculate the wave length (3mks)
5. a) Define **pressure** and give its S.I nits. (2mks)
6. The diagram below represents a motor car hydraulic braking system;

Brake pedal

Master piston

Slave piston brake fluid

**B**

**A**

1. State **two** properties of the liquid used as a brake fluid (2mks)
2. Given that in the diagram **(b)** above the master piston has an area of 15cm2 and the slave piston has an area of 50cm2 a force of 100N is applied on the master piston. Find the force used to stop the car. (3mks)
3. Compare the values of pressure in the two pistons above and give a reason for your answer. (2mks)
4. Give a reason why gas is not suitable for use in place of the brake fluid. (1mk)

11 (a) State Hooke’s Law (1mk)

(b) The diagram below shows a graph of force against extension for a certain spring.



***Extension (cm)***

***Force (N)***

What is the spring constant of the spring? (3mks)