MID TERM EXAM

PHYSICS

TIME: 1 HOUR

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

1. Differentiate fundamental quantities from derived quantities and give an example of each (2mks)

 Basic fundamental quantities cannot be derived from any other physical quantities while derived quantities are any other physical quantities while derived quantities are obtained are obtained by multiplication or division of basic physical quantities.

1. State what the following branches of physics deals with: (6mks)

(i) Mechanics

Study of motion

(ii)Electricity and magnetism

Relationship between electric currents and magnetic fields

(iii)Thermodynamics

Study of transformation of heat to and from other sources of energy

(iv)Geometric optics

Behavior of light as it traverses various media

 (v)Waves

Propagation of energy through space

(vi)Atomic physics

Study of behavior of particles constituting the nucleolus and energy changes

1. State the SI units of the following quantities (3mk)

Length =……l……………………………………………

Mass =………kg……………………………………….

Temperature =………K………………………………………..

1. Convert the following values into SI units

 (i) 86400cm2  (1mk)

1 m=100cm

1m²=10000cm²

=8.64m²

1. A student measured the length of a wire four times using a meter rule and obtained the following readings: 18.6cm; 18.5cm; 18.6cm; and 18.5cm. Determine the length the student(2mks)

18.6+18.5+18.6+18.5 =74.2

74.2÷4=18.55

 =18.55

1. In an experiment to estimate the height of a tree using its shadow, a ruler of height 100cm is placed next to the tree as shown below. If the ruler and the tree forms shadows of 150cm and 750cm respectively.

**150cm**

**100 cm**

**h**

**750cm**

**Tree**

**Ruler**

**Tree Shadow**

**Ruler Shadow**

Calculate the height h of the tree.

 (3mk)

100/150=h/750

h=500

1. A thin wire was wound 10 times closely over a boiling tube. The total length of the wire wound around was found to be 440mm. Calculate the radius of the boiling tube in SI units. (3mks)

**Thread**

**Cylinder**

440/10

=44 (circumference)

C=πD

D=14

R=7mm

=0.007m

1. The figure below shows the map of a school compound. Each square is equivalent to 1cm2. Calculate the total area covered by the school on the map. (3mk)

 Full squares=22 =22cm²

Incomplete squares = 23

 23/2 =11.5

 Total area=22+11.5

= 33.5cm²

1. a) Define volume and give its SI units. (2mks)

Volume is the amount of space occupied by matter . The SI unit is m²

b) Find the capacity of a cylinder of radius 70cm and height 20cm in liters. (3mks)

V=πr²h

 =308000cm³

=308 litres

c) A sphere of radius 6cm is molded into a thin cylindrical wire of length 32cm. Calculate the radius of the wire in SI Units. (3mks)

 Volume=4/3πr³

905.143cm²=πr²h

r²=9.0009

r=3cm

0.03m

1. a) Define density and give its SI units. (2mks)

Density is mass per unit vplume and the SI unit is kg/m³

 b)The figure below shows a block of mass 360g.

**2cm**

**12cm**

**5cm**

 Calculate the

1. Volume of the block.(1mk)

12×5×2= 120cm²

 (ii) Density of the block in SI unit.(2mks)

Density=m/v

360÷120

 =4g/cm³

4000kg/m³

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)

Mass of empty d.b=50g

Mass of empty d.b with water =100g

Mass of water=100-50 =50g

Density of water=1g/cm³

Volume=50cm³

Density of liqud K?

Mass=120g-50g =70g

Density=70/50

 =1.4g/cm³

 =1400kg/m³

1. 1600 cm3 of fresh water of density 1g/cm3 are mixed with 1400cm3 of seawater of density1.25g/cm3. Determine the density of the mixture.(3mks)

Volume of fresh water=1600cm³

Volume of sea water =1400cm³

Total volume=3000cm³

 Mass of water= ¶×v

1×1600

=1600g

Mass of sea water ¶×v

1.25×1400

=1750g

Therefore total mass =3350

 3350/3000

 =1.117g/cm³

1. A butcher has a beam balance and masses 0.5 kg and 2 kg. How would he measure 1.5 kg of meat on the balance at once?(2mks)

Put the 2kg mass one one side of the beam balance.Take the 0.5 kg mass and place it on the other side of the beam balance. Put a mass that will balance the 2kg mass.