Physics

1. (a) Find the acceleration of a particle moving in a circular path of radius 'a' with uniform angular velocity 'ω'.
   (b) Find the force constant (μ) of a body of mass 'm' gm performing simple harmonic motion, with a time period of 'T' seconds.
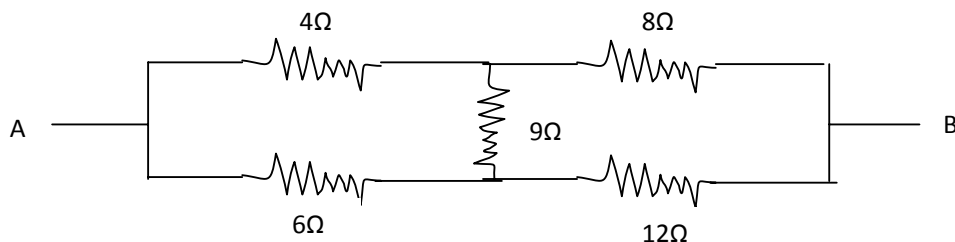   (c) A body performing free simple harmonic motion has maximum energy at …

2. (a) Give reasons for taking a conical pot for determining the mechanical equivalent of heat by friction cone method.
   (b) 'm' gm of ice at 0^0C is converted into water vapour at 100^0C . Calculate the change in entropy.

3. (a) Give Newton's formula for velocity of light and explain its short comings. What corrections were made by Laplace in this formula?
   (b) A metal ball of radius 0.2 cm and density 7.6 gm/cc is dropped in a fluid of viscosity 8.8 poise. Calculate the terminal velocity of the ball. (density of fluid =1.3 gm/cc. acceleration due to gravity =980 cm/sec^2)

4. (a) Explain tanA deflection method of comparing magnetic moments of two bar magnets. Why tanA position is superior to tanB position for comparing the magnetic moments of two magnets?
   (b) Define angle of dip, horizontal component and vertical components of earth magnetic field and inter-relate them.

5. (a) Obtain an expression for energy of a charged conductor.
   (b) Calculate the effective resistance of the following circuit between point A and B.

6. (a) Explain Seebeck and Peltier effect in thermoelectricity and define Neutral temperature and temperature of inversion.
   (b) How an ammeter of range 1 ampere and resistance 0.05 ohm can be converted into a voltmeter of volts range.

7. (a) What is the use of a telescope? Give a neat ray diagram for the same.
   (b) A beam of light is incident on a rectangular glass slab of thickness 10 cm at an incidence 60^0. Calculate the time after which the light will emergency form the other place (Refractive index of glass 1.5).

8. (a) Explain interference of light.
   (b) How an achromatic combination can be prepared from two lenses of the same material.

9. (a) State the postulates of Bohr theory of hydrogen atom and find expression for the energy of an electron in an orbit.

(b) With the help of a neat circuit diagram, explain the use of a diode valve as a full wave rectifier.

10.(a) State important properties of X-rays.

(b) A substance has a photoelectric work of function of 1.2 eV. A light of wavelength 6000 A^0 falls on the substance. Calculate the cut of potential.