**Assignment 5: G.P. Thomson Model**

**Theory**:

In this method, the waves of a given wavelength(de-Broglie) undergo selective reflections by those micro crystals (of metal foil) whose planes are suitably oriented. According to Bragg's equation **2dsinθ=nλ.**

When large number of micro crystals with all possible orientations are present then some of them may have appropriate glancing angle θ to yield a Bragg reflection from one or more sets of planes.

Corresponding to angle of scattering α=2θ, the diffracted waves of electron will follow a cone whose axis lies along the direction of incident beam. As a result, concentric rings are formed on the photographic plate as shown in fig(b).

**Construction:**

Filament F is heated by passing electric current through it using low tension battery B1. The electrons are emitted by filament due to thermionic emission.

These electrons are then accelerated under a high potential difference of 10KV to 50KV applied to cylindrical anode A by battery B2.

A fine beam of electron coming out of the anode A is made to fall on a thin foil(thickness=10-6cm) of a metal like gold, silver etc.

The electrons after diffraction are received on a photographic plate P placed with its plane parallel to the foil.

The photographic plate shows a pattern of a number of concentric rings around a central spot as shown in fig(a).

