Experiment-3

Magnetic Field of Circular coil

Aim: To study the variation of magnetic field along the axis of a circular coil carrying steady current.

Apparatus: Circular coil, Battery, Rheostat, one-way key, Reversing key, Ammeter, Magnetic compass, Connection wires.

Formula: - $B_x = B_H \tan\theta$

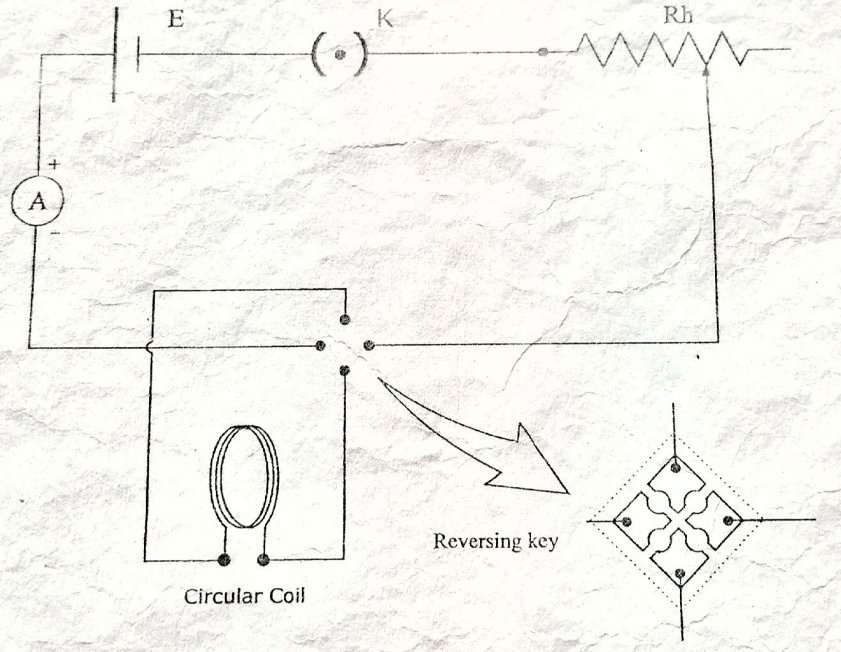
Where x = Distance between the center of the coil and the center of magnetic needle

B_X = Magnetic field due to the current carrying Circular coil at X.

B_H = Horizontal component of the earth's magnetic field (0.36×10^{-4} Weber/m^2)

θ= Deflection of the magnetic needle of the compass in degrees.

Circuit Diagram: -



Observation Table:

1) Constant Current (I) passing through the coil = _____ mA

Obs. No.	X cm	Deflection (in degrees) θ_1	θ_2	θ_3	θ_4	Mean θ	tanθ	B_X (10^{-5} Wb/m^2)
Centre	0							
LHS 1								
2								
3								
4								
5								
6								
7								
RHS 1								
2								
3								
4								
5								
6								
7								

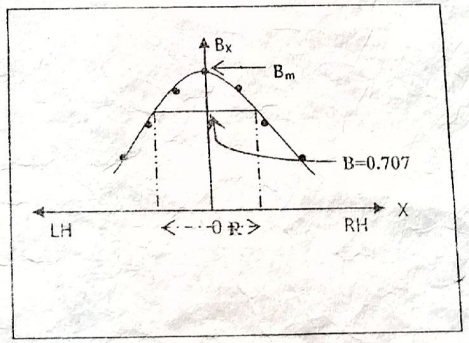
2). At centre of coil;

Obs. No.	I (mA)	Deflection (in degrees) θ_1	θ_2	θ_3	θ_4	Mean θ	tanθ	B_X (10^{-5} Wb/m^2)
1								
2								
3								
4								
5								
6								
7								

Graphs:

1. Plot graph between magnetic field vs position

2. Plot graph between magnetic field vs current



Result: Radius of circular coil,

R =.....cm

Conclusion: