Title: IMPEDANCE MEASUREMENT

Aim: i) To measure the resistance and inductance of a choke coil.
        ii) To measure the resistance and capacitance of a non ideal capacitor.

Apparatus required:

Sl.	Name of Equipments	Specification	Quantity
1	Regulated DC power supply		
2	Variac		
3	Voltmeter (MI)		
4	Voltmeter (MC)		
5	Ammeter (MI)		
6	Ammeter (MC)		
7	Wattmeter		
8	Choke coil		
9	Capacitor		
10	Connecting wire		

Theory

Procedure:

a) Measurement of resistance and inductance of a choke coil
    i)   Connect the circuit as in figure 1
    ii)   Vary the value of supply voltage (DC) from minimum to maximum
    iii)   Note the value of voltage and current in table 1
    iv)   Plot a graph between voltage and current
    v)   Calculate the value of resistance from the slope of the graph
    vi)   Connect the circuit as in figure 2
    vii) Repeat step (ii) , (iii), (iv) with AC source
    viii) Calculate the value of impedance from the slope of the graph
    ix)   Calculate the inductance of the coil.

b) Measurement of resistance and capacitance of a non ideal capacitor
    i)   Connect the circuit as in figure 1
    ii)   Vary the value of supply voltage from minimum to maximum

iii) Note the value of voltage and current in table 3
iv) Plot a graph between voltage and current
v) Calculate the value of resistance from the slope of the graph
vi) Connect the circuit as in figure 2
vii) Repeat step (ii) , (iii), (iv) with AC source
viii) Calculate the value of impedance from the slope of the graph
ix) Calculate the capacitance.

Fig 1

Fig 2
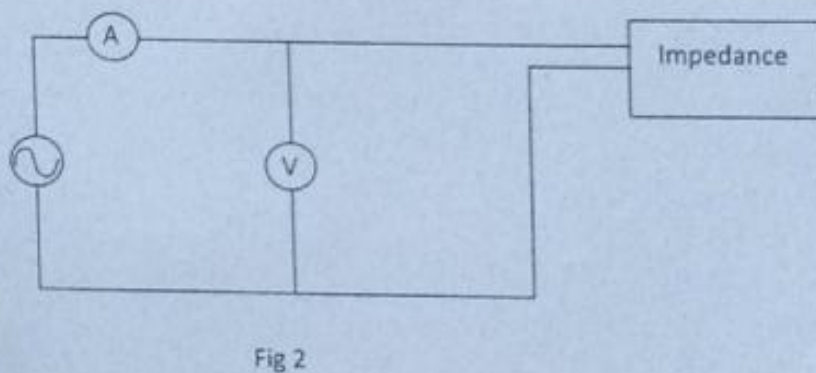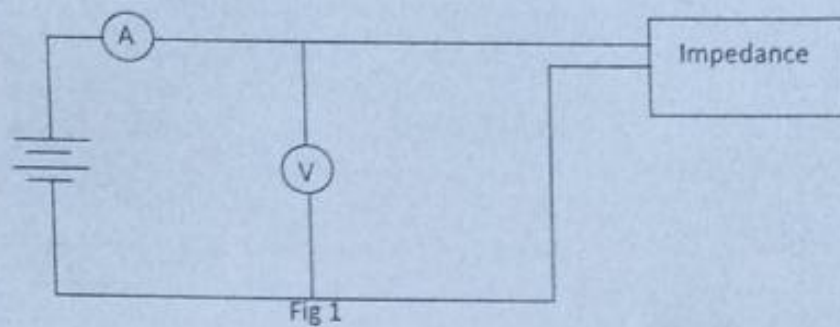
Observation

Table1: Table for finding resistance of the coil

Sl.No	Voltage (V)	Current (i)

Table2: Table for finding impedance of the coil

Sl.No	Voltage (V)	Current (i)

Table 3: Table for finding resistance of non ideal capacitor

Sl.No	Voltage (V)	Current (i)

Table 4: Table for finding impedance of non ideal capacitor

Sl.No	Voltage (V)	Current (i)

Calculation:-

Precaution:-

Discussion:-

e) Consider a coupled inductor (say a transformer). How will you experimentally determine the value of L_1, L2 and M.