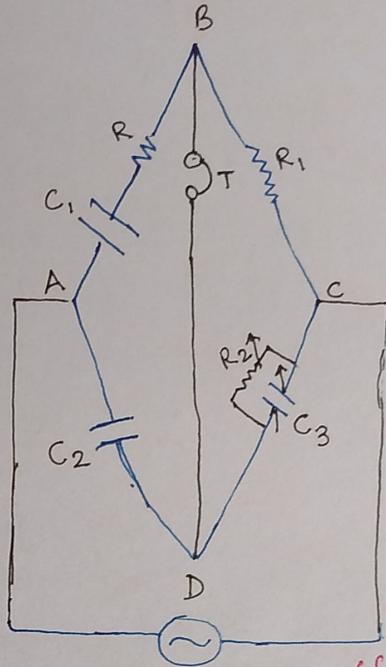


Ques :- Describe Schering Bridge for measuring Capacitance. Give a the circuit diagram for the Bridge. 119

Schering Bridge is an A.C. Bridge. Its circuit diagram is shown below.

Actually the Bridge is used for measuring d.e.c's. and very small capacitances.

The unknown capacitor C_1 is placed in series with a known resistance R . C_2 is a good standard capacitor of which the capacitance is of the same order as that of the unknown C_1 . R_1 is a fixed resistance and R_2 is variable resistance shunted by a variable capacitor C_3 .



(fig.)

The condition for balance is

$$\frac{\left(R + \frac{1}{j\omega C_1}\right)}{R_1} = \frac{1}{j\omega C_2} \bigg/ \frac{1}{\left(\frac{1}{R_2} + j\omega C_3\right)}$$

$$\text{or, } j\omega C_2 \left(R + \frac{1}{j\omega C_1} \right) = R_1 \left(\frac{1}{R_1} + j\omega C_3 \right) \quad \text{MS} \quad \checkmark$$

$$\text{or, } j\omega C_2 R + \frac{C_2}{C_1} = \frac{R_1}{R_3} + j\omega C_3 R_1 \quad \text{--- (1)}$$

Equating the real and imaginary parts,
We get

$$\frac{C_2}{C_1} = \frac{R_1}{R_2} \quad \text{or, } C_1 = C_2 \frac{R_2}{R_1} \quad \text{--- (2)}$$

and

$$C_2 R = R_1 C_3 \quad \text{or, } R = R_1 \frac{C_3}{C_2} \quad \text{--- (3)}$$

— 0 —