DE-SAUTY BRIDGE

Object: To determine the capacitance of capacitor by De-Sauty bridge.

Apparatus Used: De-Sauty bridge, connecting wire, Head phone.

Formula Used: The following formula is used for the determination of self inductance of coil.

$$C_x = \frac{R_1}{R_2}C_0 = \frac{P}{Q}C_0$$

Where, Cx: capacitance of unknown capacitor; C_0: capacitance of unknown capacitor; $R_1=P$: and $R_2=Q$: resistances

Circuit Diagram:

Under the balance condition

$$\frac{Z_1}{Z_2} = \frac{Z_3}{Z_4}_0$$

$$\frac{1/j\omega C_0}{P} = \frac{1/j\omega C_X}{Q}$$

$$\frac{1}{PC_0} = \frac{1}{QC_X}$$

$$C_x = \frac{P}{Q}C_0$$
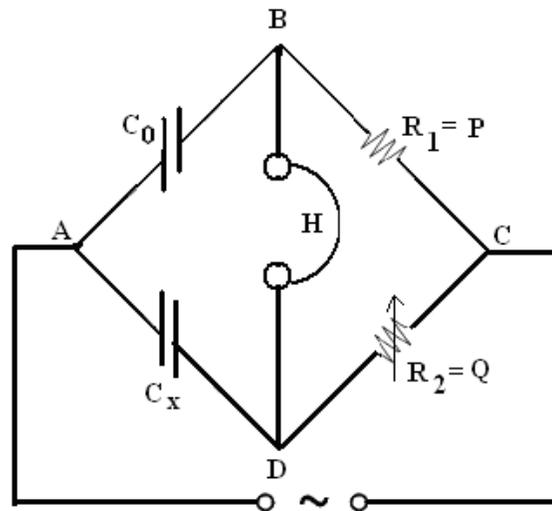
Fig: Circuit diagram of De-Sauty Bridge

Procedure:

1. Make connections as shown in fig i.e. connect source point with AC source, connect Head phone at detector point and capacitor at unknown point in your given kit.

2. Now put a fix value of resistance in arm BC (resistance P).

3. After it, listen the sound in Headphone varying the resistance in arm CD (resistance Q). You will receive a varying sound. Note the value of Q for which no sound is heard in head phone.

4. Repeat the point 3 for different fix values of P.

5. Repeat the points 1 to 4 selecting different capacitors.

Dr. D. K. Pandey

Observation:

1. $C_0 = \ldots\ldots\ldots\mu f$

2. Table for value of P and Q for Ist capacitor

Sr. No.	$P(\Omega)$	Perception of sound with Q	Q (Ω) (At no sound)	$C(\mu f)$ $C_x = \dfrac{P}{Q} C_0$	Mean $C(\mu f)$
Ex.	100	90-sound 100-no sound 110-sound	100	$Cx = \dfrac{100}{100}\ C_0$	
1.					
2.					
3.					
4.					

3. Table for value of P and Q for IInd capacitor

Sr. No.	$P(\Omega)$	Perception of sound with Q	Q (Ω) (At no sound)	$C(\mu f)$ $C_x = \dfrac{P}{Q} C_0$	Mean $C(\mu f)$
1.					
2.					
3.					
4.					

4. Table for value of P and Q for IIIrd capacitor

Sr. No.	$P(\Omega)$	Perception of sound with Q	Q (Ω) (At no sound)	$C(\mu f)$ $C_x = \dfrac{P}{Q} C_0$	Mean $C(\mu f)$
1.					
2.					
3.					
4.					

5. Table for value of P and Q for IVth capacitor

Sr. No.	$P(\Omega)$	Perception of sound with Q	Q (Ω) (At no sound)	$C(\mu f)$ $C_x = \dfrac{P}{Q} C_0$	Mean $C(\mu f)$
1.					
2.					
3.					
4.					

Result:

1. Capacitance of Ist capacitor = ………μf

2. Capacitance of IInd capacitor = ………μf

3. Capacitance of IIIrd capacitor = ………μf

4. Capacitance of IVth capacitor = ………μf

Precaution:
1. Connections should not be loose.
2. The resistances should be high.
3. If there is found no sound in head phone for a range of Q resistance then total range should be noted and mean of them should be taken for Q at no sound.

Dr. D. K. Pandey