EXPERIMENT: 1

OBJECTIVE:

Pre determination and verification of ABCD parameters of transmission line.
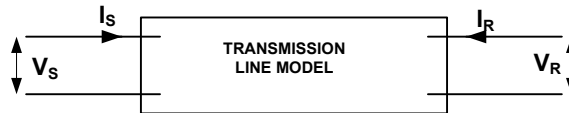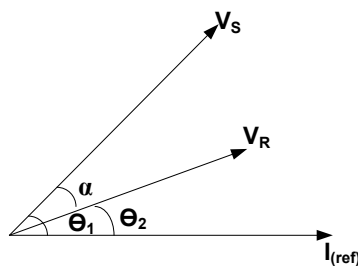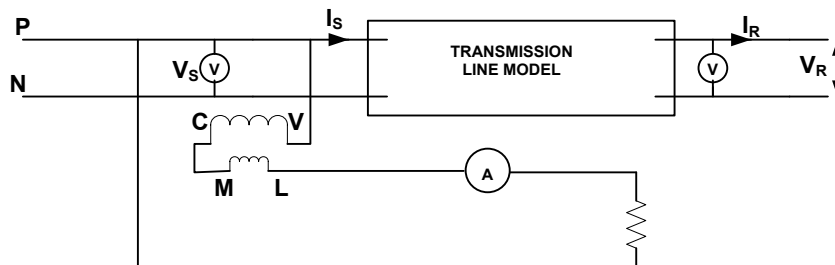
THEORY:

Fig 1(Model of line)

Experimental determination of these parameter can be done by employing voltmeter and ammeters for measurement for their magnitudes and wattmeter suitably used for phase angle measurement.

PROCEDURE:

$$P_1 = V_S I \cos\Theta_1$$

$$P_2 = V_r I \cos\Theta_2$$

$$A = \frac{Vs}{Vr} \qquad \text{at } I_r = 0$$

Fig 2 for determining A

For parameter: A

   (1) Keeping receiving end voltage open(no load) as shown in fig 2 ,measure V_s V_r, I and power P_1(when voltage and coil of wattmeter is excited by V_s)and power P_2(when voltage coil of wattmeter is excited by V_r)

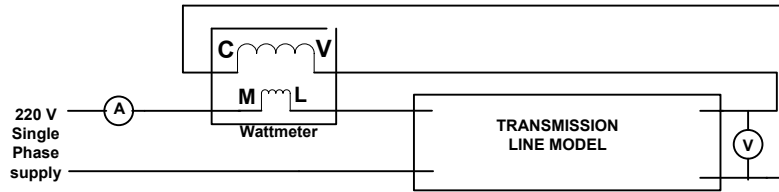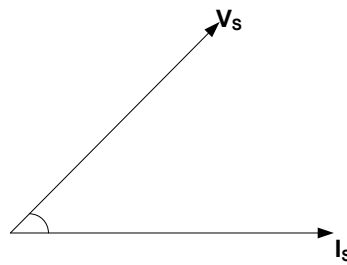Fig 3 For determining C

$$C=C<\alpha\{Is|Vs\}=c< \theta \ (\text{at } I_r=0)$$

For parameter: C

   (2) Connect as show in fig 3, Measure V_r,I_s,and P(wattmeter current coil excited by I_s, and voltage coil excited by V_r)

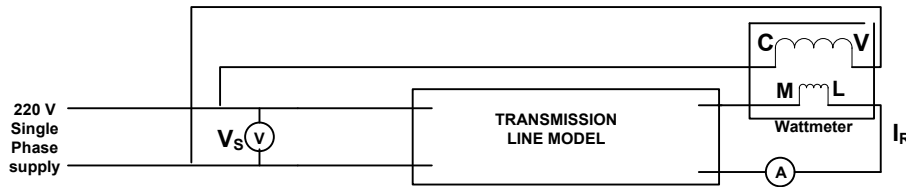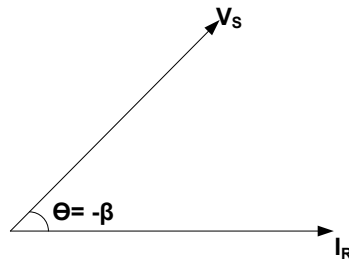   Note: Take V_r as reference phasor & use a low p.f wattmeter.

Fig 4 For determining B

$$B=B< -\theta$$

(3) Short circuit the receiving end side as shown in fig 4. Apply reduced voltage at sending end and try to flow rated I_r(about 1.0 amps). Measure V_s, I_r and power.
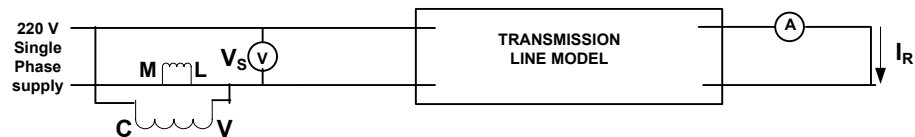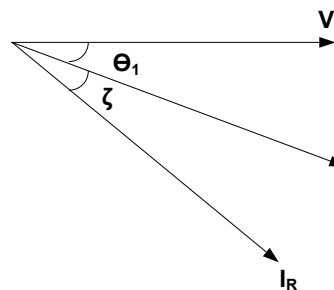

Fig 5 For determining D

$$D = D < -\theta$$

(4) Connect the circuit as shown in fig 5. Short the receiving end as shown and apply reduced voltage so as to flow approximately 1.0 amps at receiving end. Measure I_S, I_r and P_1 (With voltage coil connected across mains and current coil being excited by I_S) and P_2 (With voltage coil connected across mains and current coil being excited by I_r). Measure P_1, P_2 and V.

RESULT: