DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

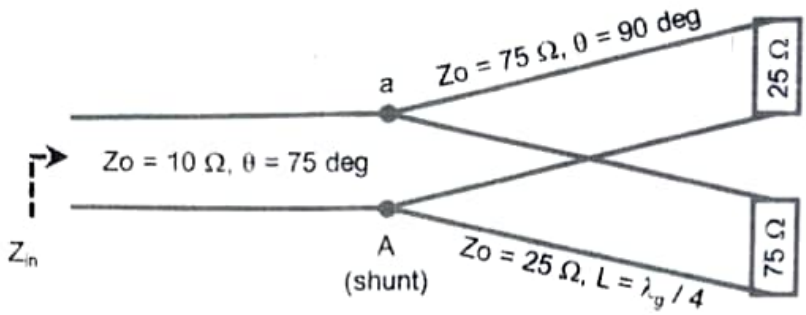
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

MID-TERM EXAMINATION (AUTUMN 2024 – 2025)

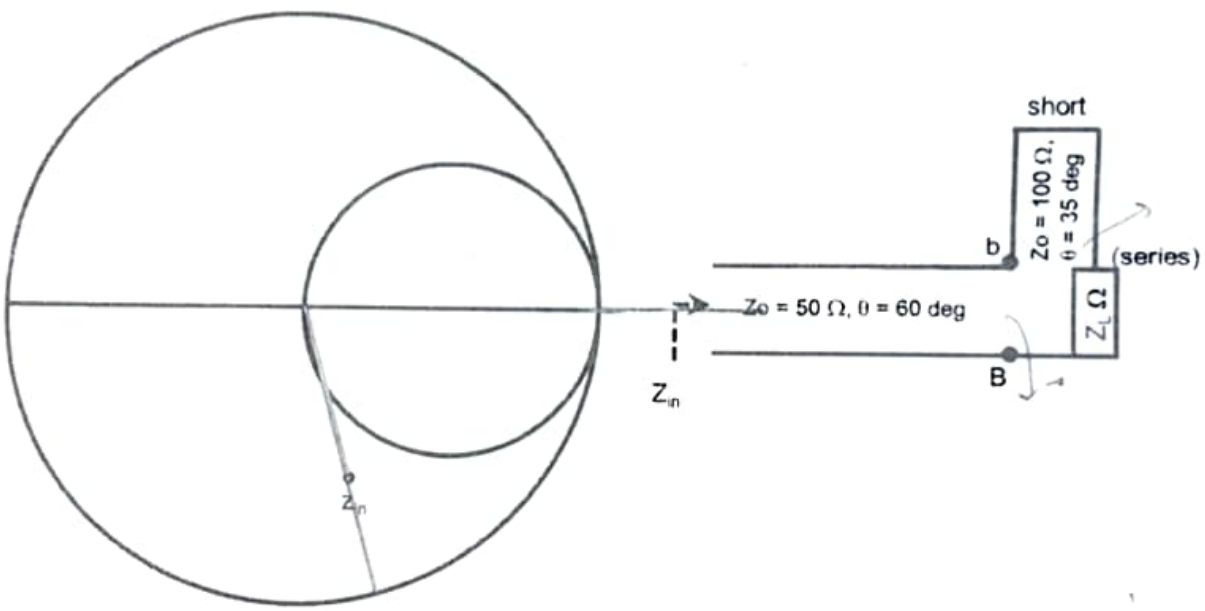
ECC 203: ELECTROMAGNETICS AND RADIATING SYSTEMS

Total Marks:25 **Duration: 1.5 hours**

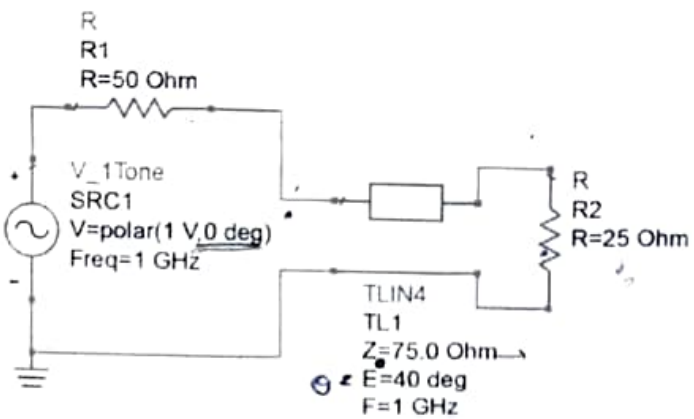
1. Find the input impedance (Z_{in}) and input reflection co-efficient (Γ_{in} with respect to 50 Ω reference at input) for the circuit given below (analytically, without using Smith Chart): **5 Marks**



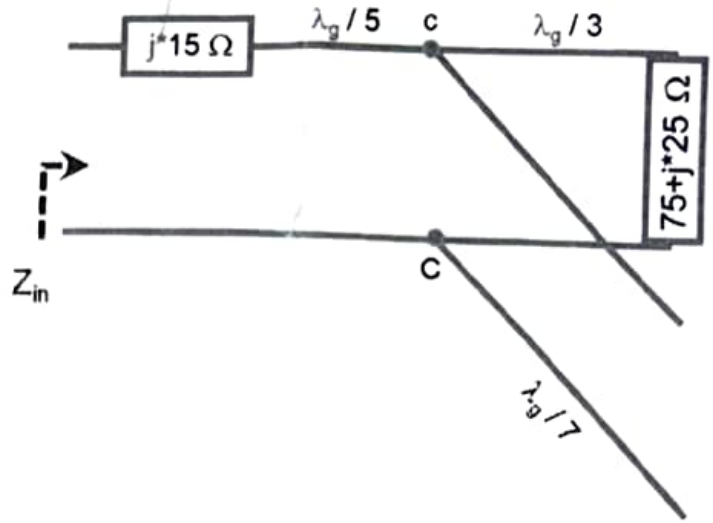
2. Find the load impedance (Z_L) for the circuit given below: **5 Marks**



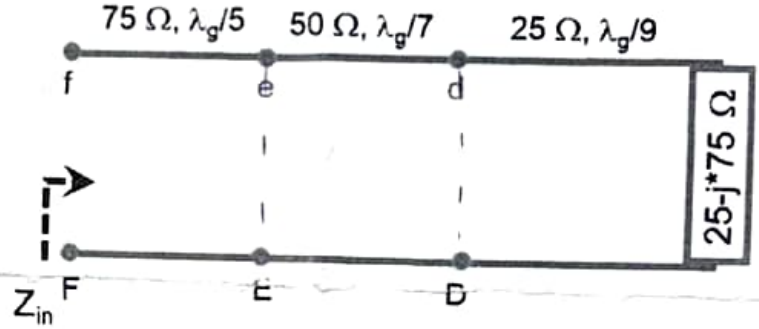
3. Determine the voltage across the load (R2, 25 Ω) and current through the load in phasor notation for the circuit below: **5 Marks**



4. Find the input impedance (Z_{in}) for the circuit given below using Smith Chart : **5 M**



5. Find the input impedance (Z_{in}) for the circuit given below using Smith Chart : **5 Ma**



Useful formula :

$$Z_{in} = Z_0 \frac{Z_L + jZ_0 \tan(\beta l)}{Z_0 + jZ_L \tan(\beta l)}$$