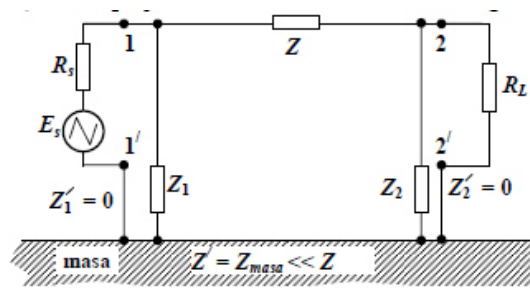
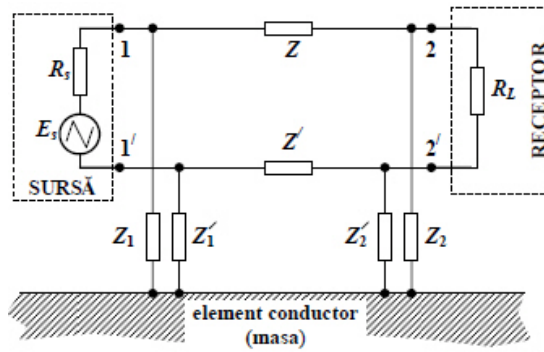
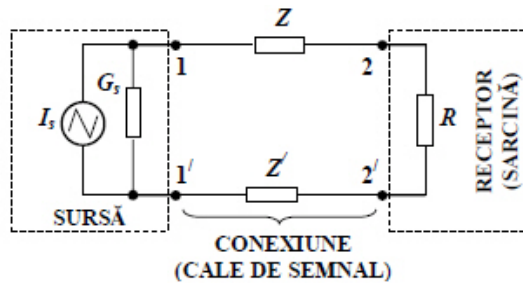
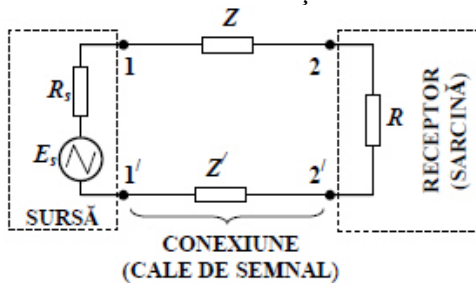


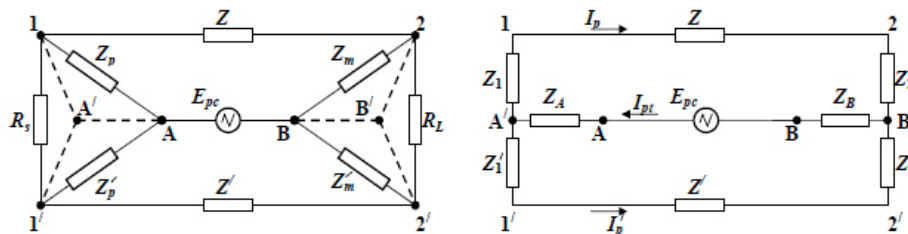
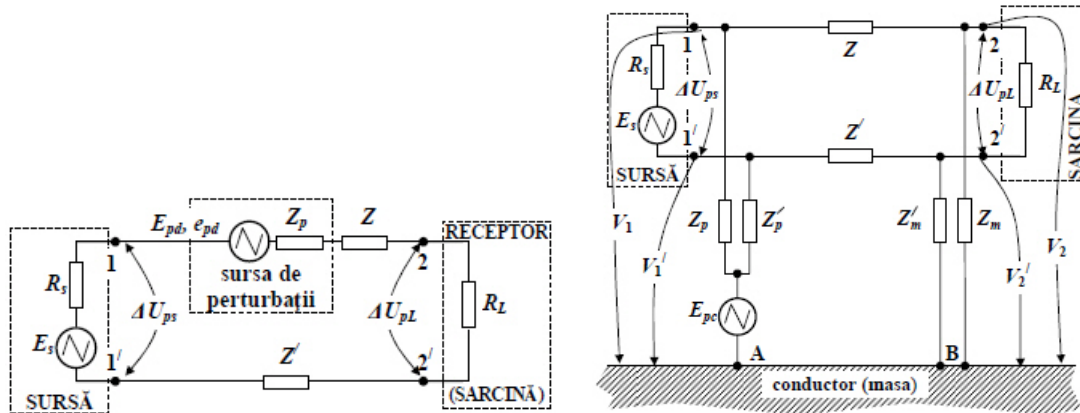
# COMPATIBILITATE ELECTROMAGNETICA

Subiecte de examen 2015

1. . Conexiuni simetrice și asimetrice. Masa în electronică.

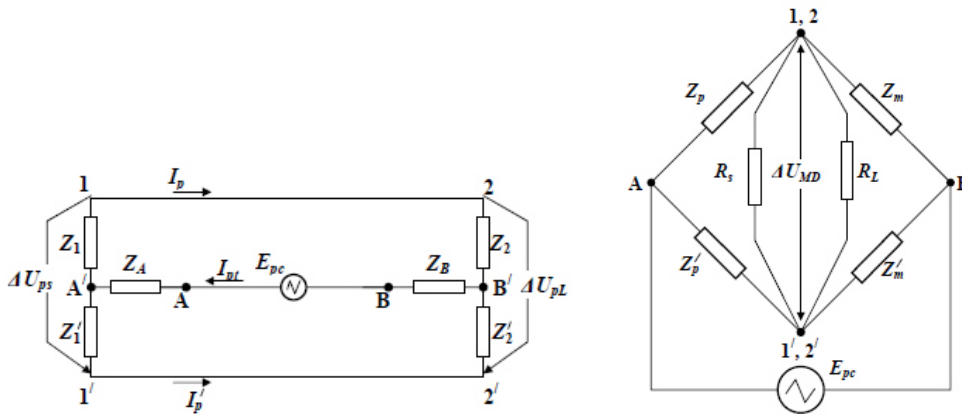


2. . Cuplaje și perturbații de mod comun și de mod diferențial. Conversia perturbațiilor MC în MD. Efectele simetrizării.

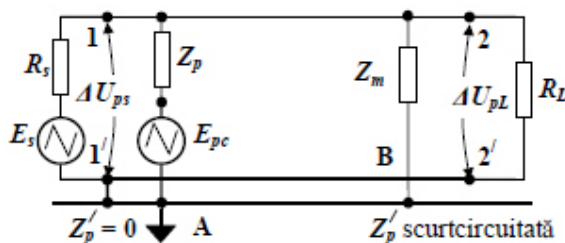


$$\Delta U_{ps} = E_{pc} \frac{Z_p}{Z_T + Z_p} \cdot \frac{Z_1 Z_2' - Z_1' Z_2}{(Z_1 + Z_2) \cdot (Z_1' + Z_2')}$$

$$\Delta U_{pL} = E_{pc} \frac{Z_p}{Z_T + Z_p} \cdot \frac{Z_1' Z_2 - Z_1 Z_2'}{(Z_1 + Z_2) \cdot (Z_1' + Z_2')}$$

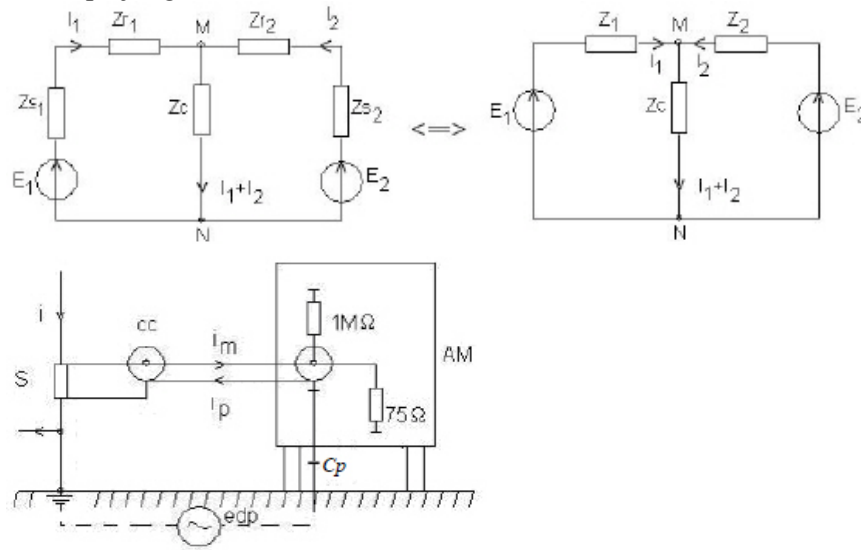


$$CMRR = \frac{E_{pc}}{|\Delta U_{MD}|} = \left| \frac{R(Z_p + Z_m)(Z_p' + Z_m') + Z_p Z_m(Z_p' + Z_m') + Z_p' Z_m'(Z_p + Z_m)}{R(Z_p' Z_m - Z_p Z_m')} \right|$$

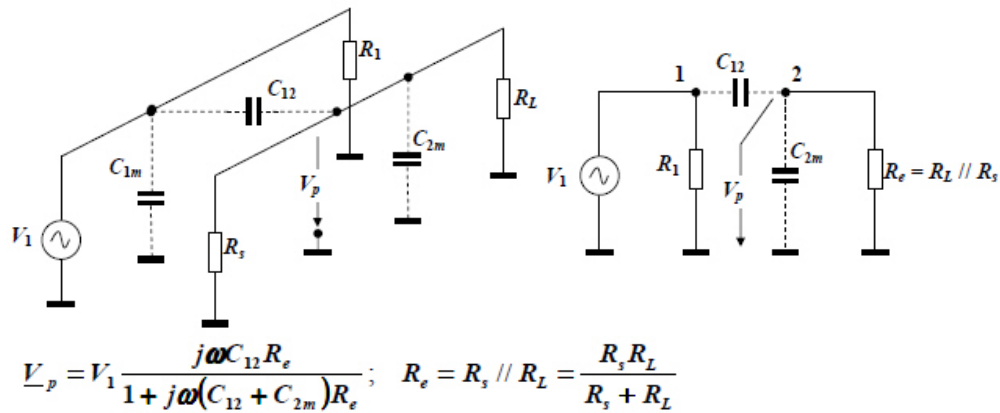


$$CMRR = \left| 1 + \frac{Z_m}{Z_p} + \frac{Z_m}{R} \right|$$

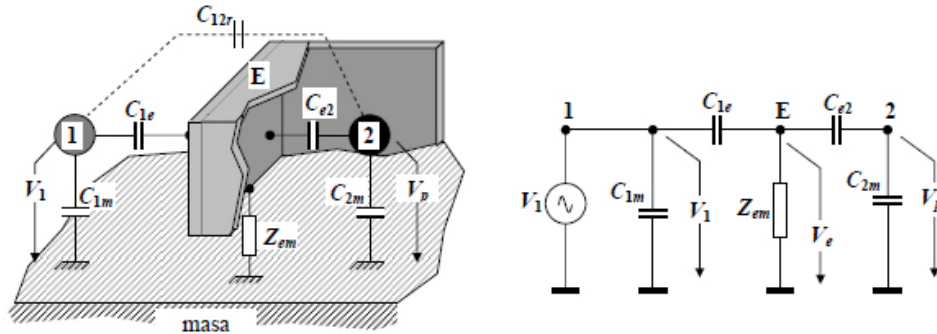
### 3. . Cuplajul galvanic.



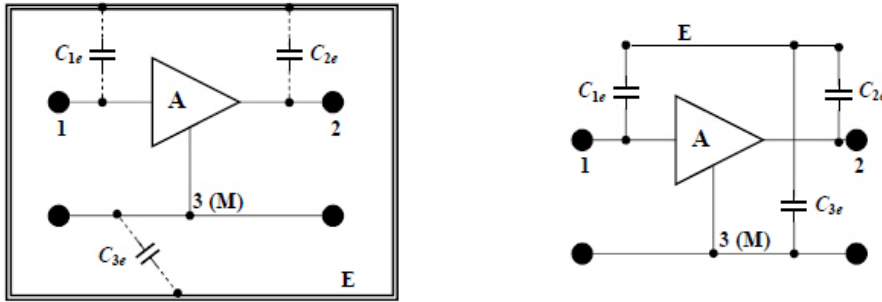
### 4. . Apariția și efectele cuplajului parazit capacitiv. Cuplajul slab și cuplajul tare. Măsurile de reducere a cuplajului.



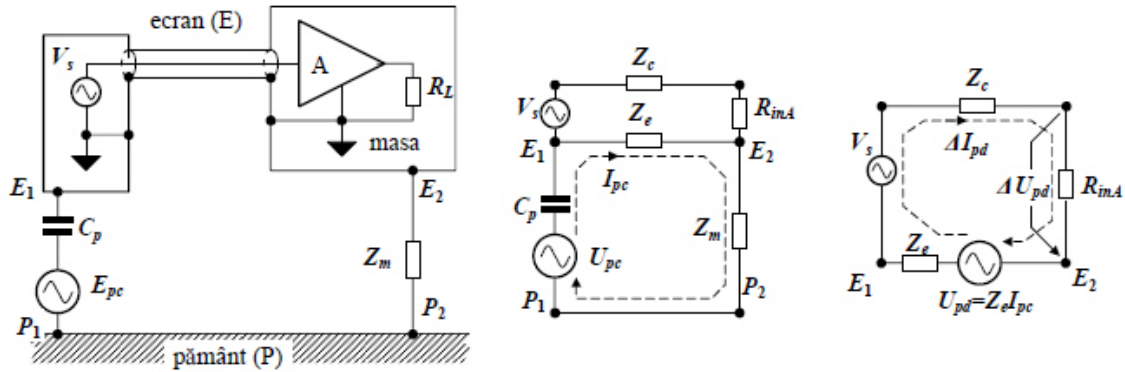
### 5. . Ecranarea electrică – mijloc de protecție contra perturbațiilor introduse prin cuplaj capacitiv: principiu de funcționare, justificarea legării la masă



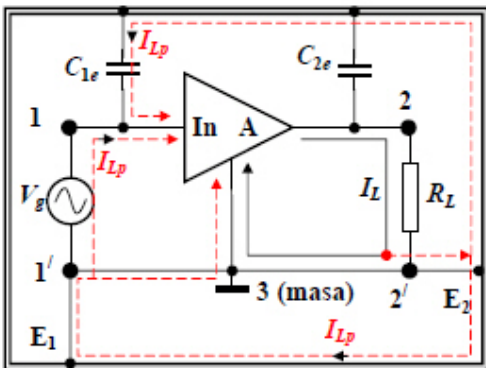
6. . Principii de conectarea la masă a ecranelor electrice. Regula nr. 1.



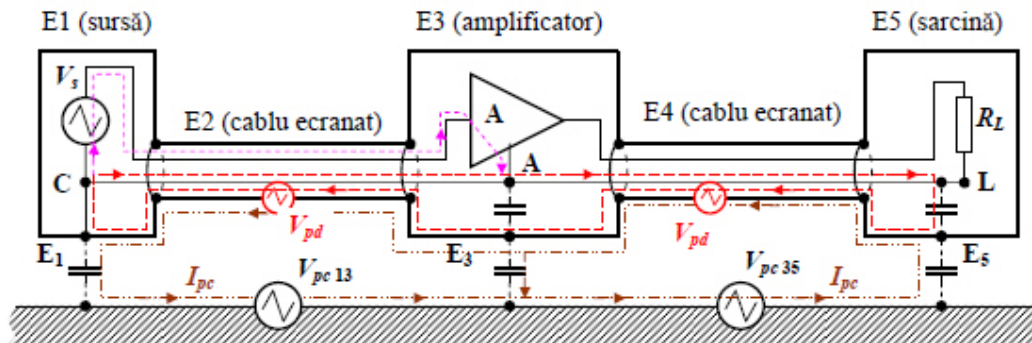
7. . Principii de conectarea la masă a ecranelor electrice. Regula nr. 2.



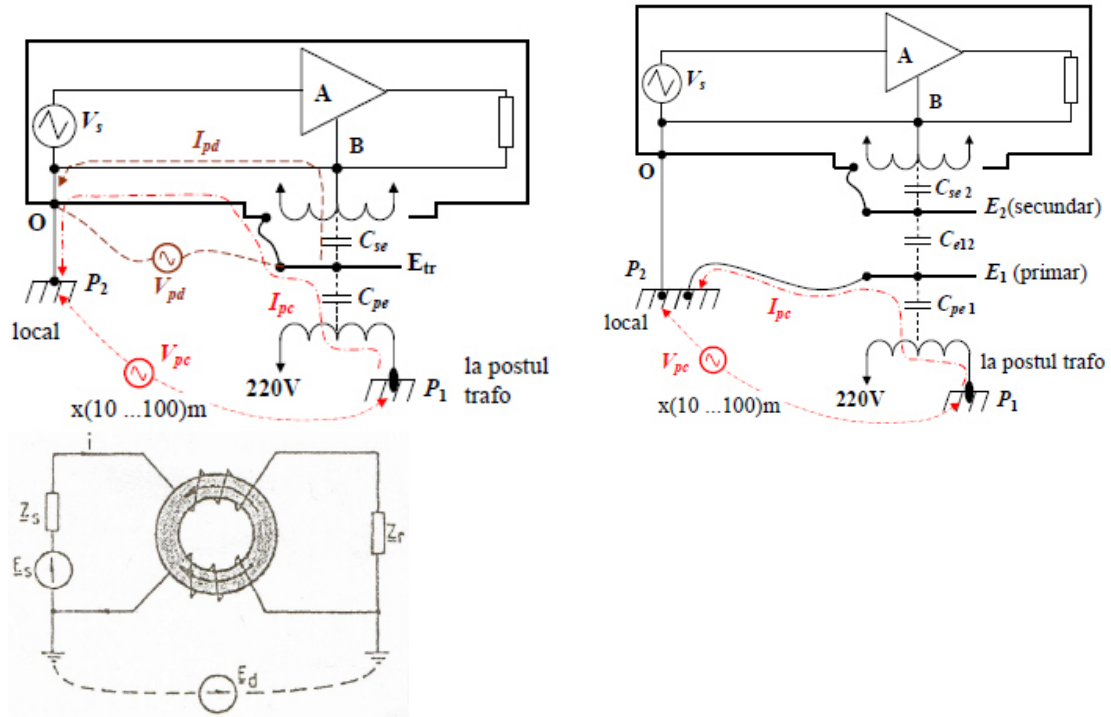
8. . Principii de conectarea la masă a ecranelor electrice. Regula nr. 3.



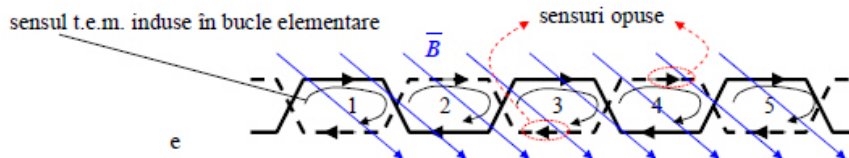
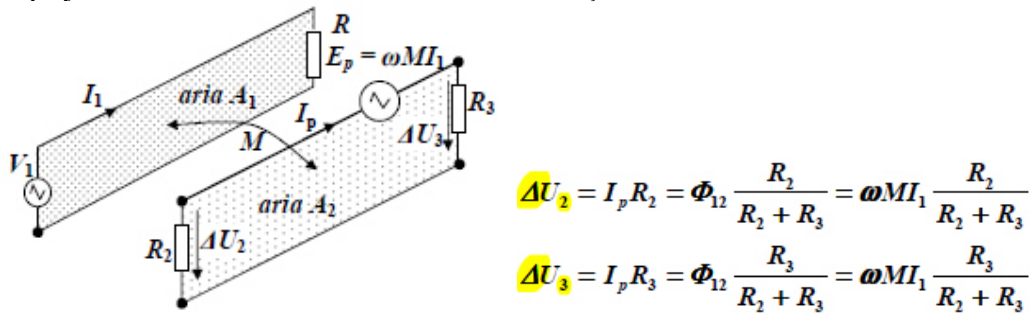
9. . Principii de conectarea la masă a ecranelor electrice. Regula nr. 4.



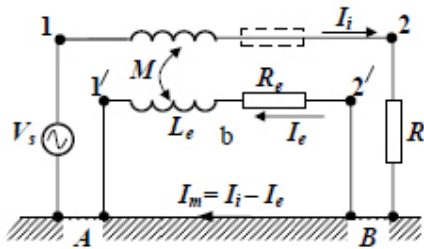
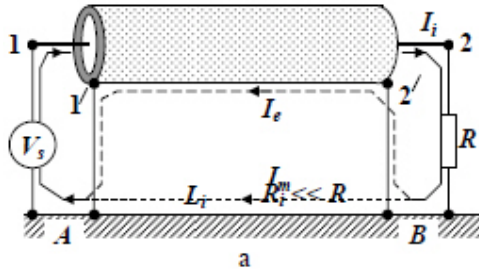
### 10. Ecranarea transformatoarelor de alimentare



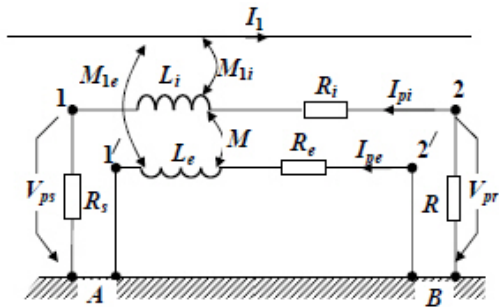
### 11. Apariția și efectele cuplajului parazit inductiv. Mijloace de reducere a efectelor cuplajului inductiv. Utilizarea cablurilor bifilare și torsadate.



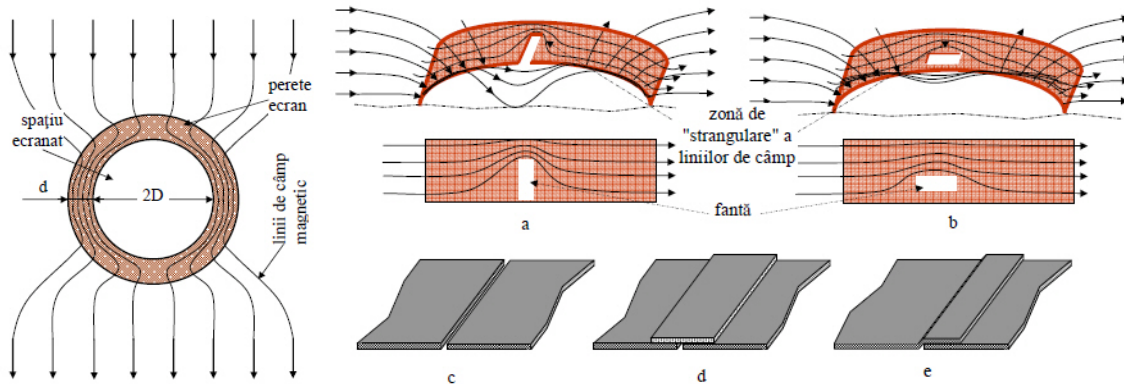
12. . Ecranarea la cuplajul parazit inductiv.



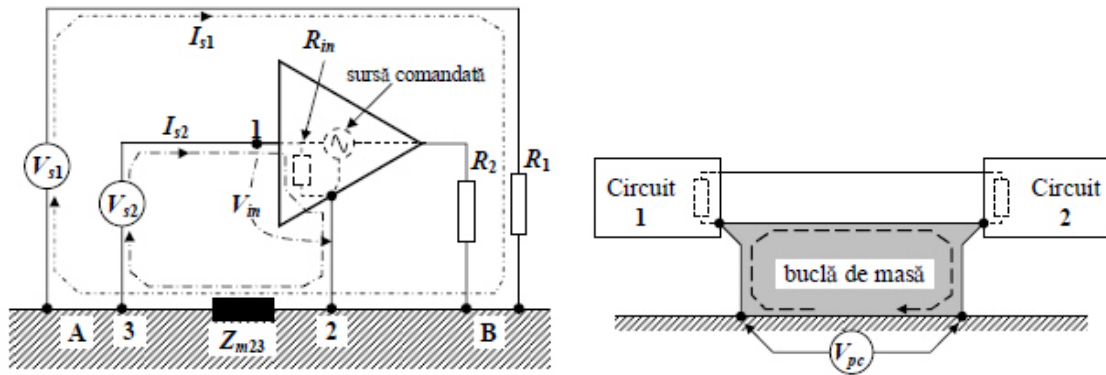
$$\underline{I}_e = I_i \frac{j\omega L_e}{R_e + j\omega L_e} = I_i \frac{\omega}{j\omega + R_e/L_e}$$



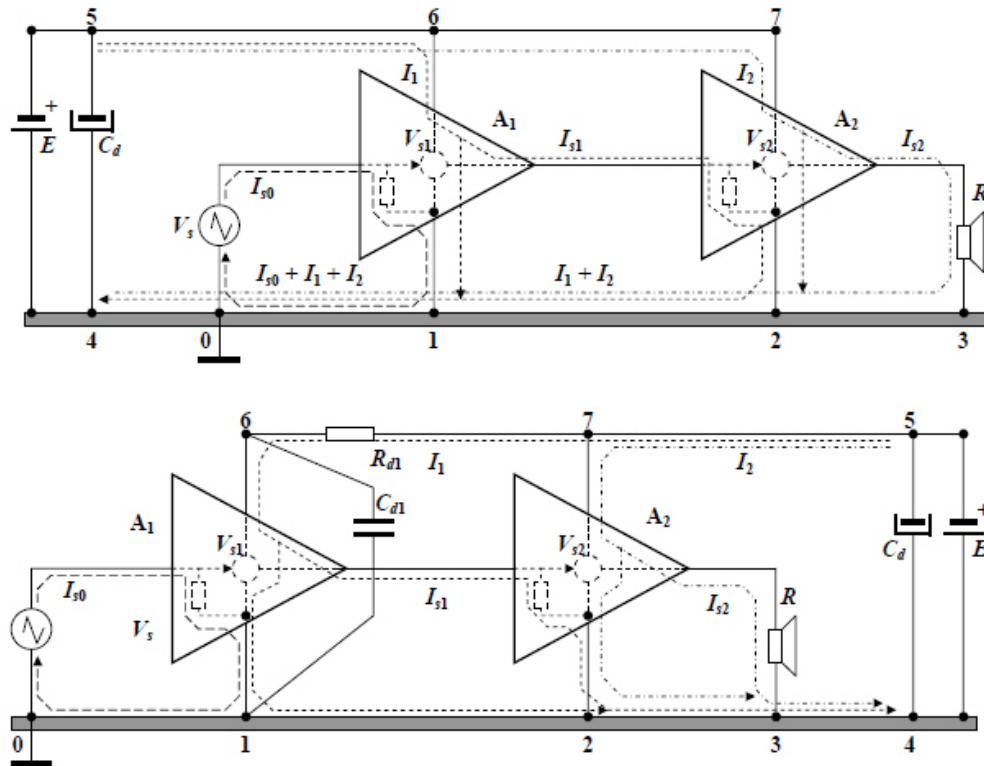
13. . Ecrane magnetice.



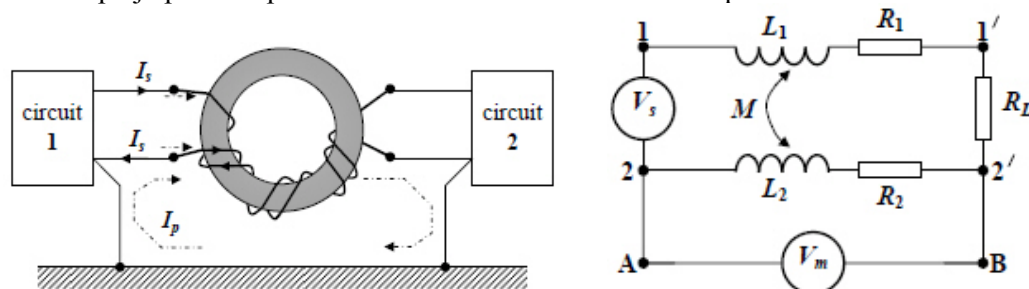
14. . Masa în electronică, tipuri de masă, cuplaje parazite prin masă. Cuplajul prin conductor comun și prin bucle de masa.



15. . Cuplajul parazit prin conductor comun de masă. Tratarea alimentării.



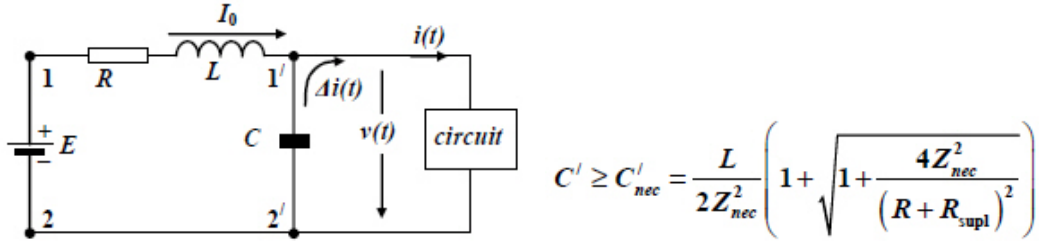
16. . Cuplaje parazite prin buclă de masă. Metode de întrerupere a buclei de masă.



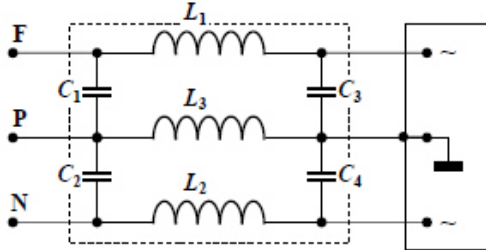
$$I_2 = I_{s1} \frac{j\omega}{j\omega + R/L} = I_{s1} \frac{j\omega}{j\omega + \omega_l}; \quad \omega_l = \frac{R}{L}$$

$$\Delta U_p = V_m \frac{1}{1 + j\omega L/R_2}$$

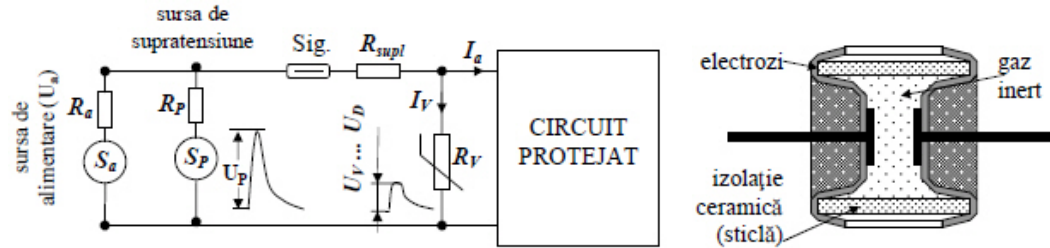
17. . Decuplarea alimentărilor în curent continuu. Calculul condensatorului de decuplare.



18. . Perturbații în căile de curent alternativ. Filtrele de rețea.

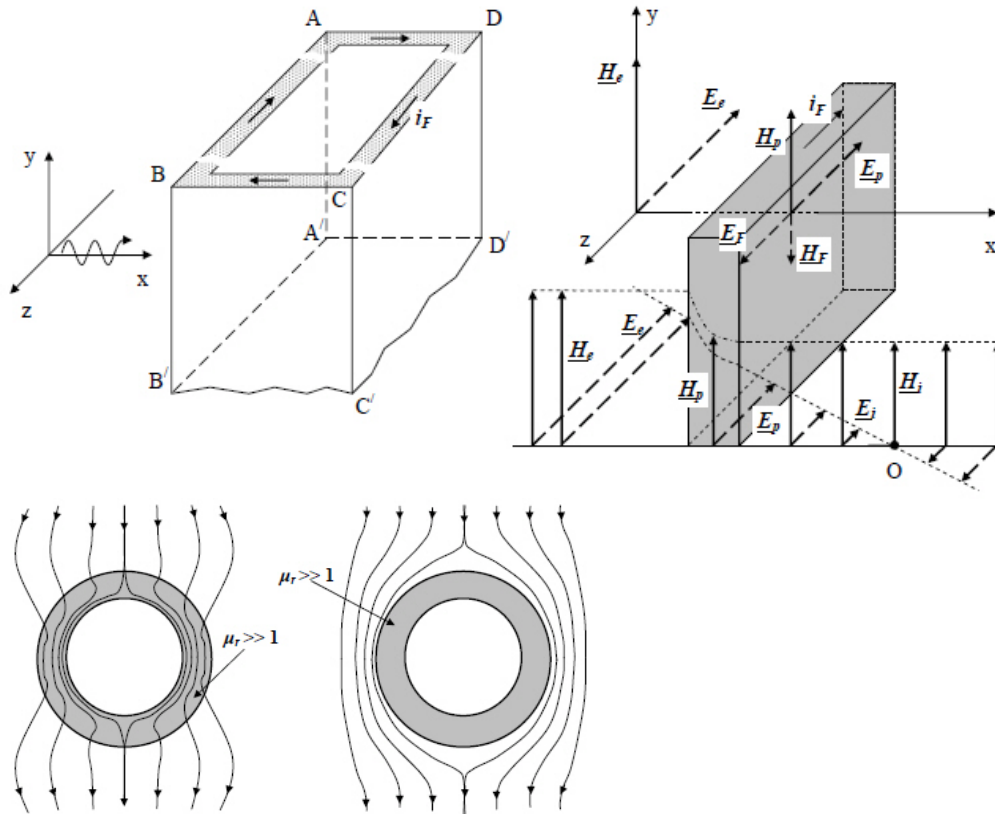


19. . Protecția liniilor de c.a. la supratensiuni. Varistoare, eclatori.

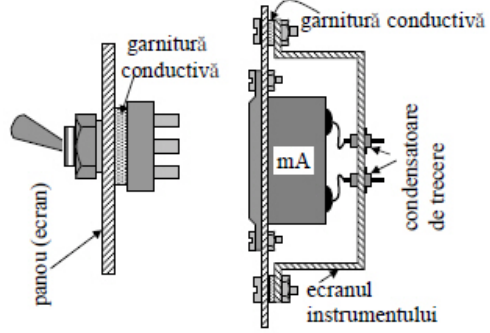




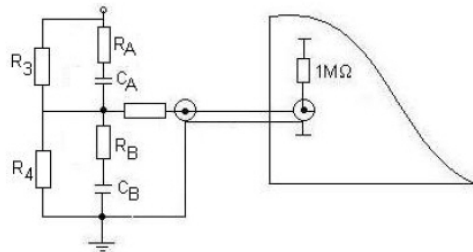
20. . Ecrane electromagnetice. Principiile funcționării ecranelor electromagnetice, materiale pentru ecrane, caracteristicile materialelor pentru ecrane magnetice.



21. . Ecrane electromagnetice. Efectele îmbinărilor și orificiilor.



22. . Măsurători de compatibilitate. Mijloace de măsurare pentru tensiuni.



23. . Măsurători de compatibilitate. Mijloace de măsurare pentru curenți.

$$R \ll 2\pi f L_s$$

24. . Măsurători de compatibilitate. Mijloace de măsurare pentru câmpuri electromagnetice.

