

Dr Isselmou Abd El Kader

CALCULATOR IS ALLOWED

HDD3020 Electric Circuits Analysis

MATERIALS ARE NOT ALLOWED

Exam : 09.04.2026

Max : 100 points

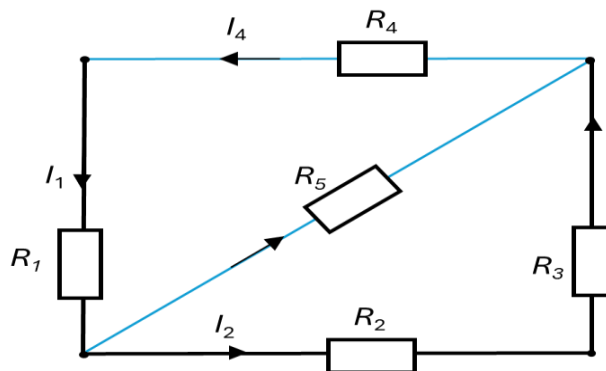
Exercise 1 (20 points)

Explain shortly following terms:

- Active Power
- Diode
- Thyristor
- Transformer

Exercise 2 (20 points)

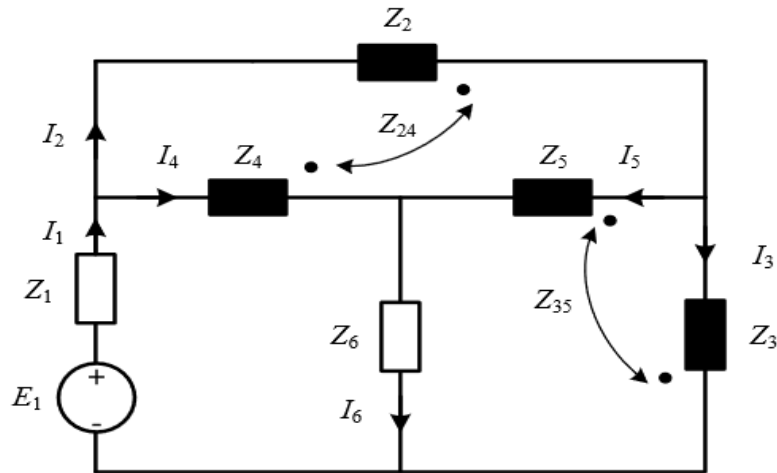
- Determine the inverse transform of the function $F(s)$, when $F(s) = \frac{1s}{s^2-2s+10}$. (Write the intermediate steps).
- Determine the inverse transform of the function $F(s)$, when $F(s) = \frac{3s}{s^2+s-2}$. (Write the intermediate steps).

Exercise 3 (20 points)Form a **C-matrix** from the circuit below:

Exercise 4 (20 points)

Form a **B** matrix from circuit below figure and determine the impedance coefficient matrix

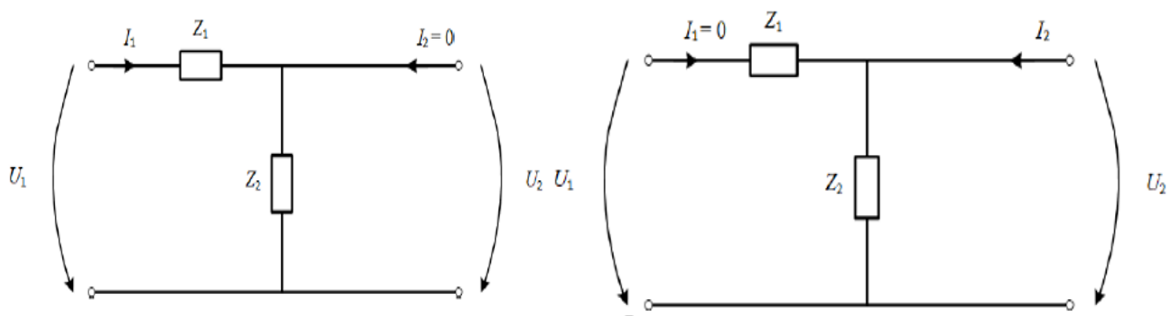
$$\mathbf{Z}_{sk} = \mathbf{B} \mathbf{Z} \mathbf{B}^T$$

**Exercise 5 (20 points)**

Consider the two-port network shown in the figure, which consists of a series impedance Z_1 and a shunt impedance Z_2 connected to a common reference (ground). Given that:

$$Z_1 = 1 \text{ and } Z_2 = 1$$

Determine the z-parameters (Z_{11} , Z_{12} and Z_{22}) of the matrix?



Good Luck
