

Final Assessment Test – April 2026

Course: BAECE103 - Network Theory

Class NBR(s): 0795 / 0797 / 0799 / 0804 / 6705

Slot: A1+TA1+TAA1

Max. Marks: 100

Time: Three Hours

KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
DON'T WRITE ANYTHING ON THE QUESTION PAPER

COs	CO Statements
CO1	Compute DC circuit parameters using circuit laws and theorems
CO2	Determine the natural and step responses of RC, RL, and RLC circuits
CO3	Apply appropriate techniques and theorems for sinusoidal steady-state analysis
CO4	Apply the Laplace transform to circuits for steady-state and transient analysis
CO5	Compute two-port network parameters and network graph matrices for circuit analysis

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Find v_1 , v_2 and v_3 in the circuit shown in Figure 1 using Nodal analysis.

CO1 BL3

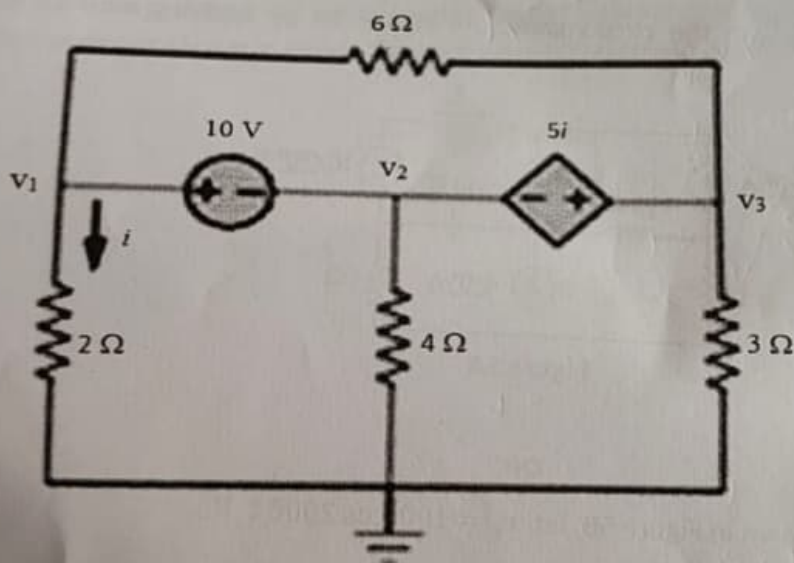


Figure 1

2. Apply Superposition principle to find v_0 in the circuit shown in Figure 2.

CO1 BL3

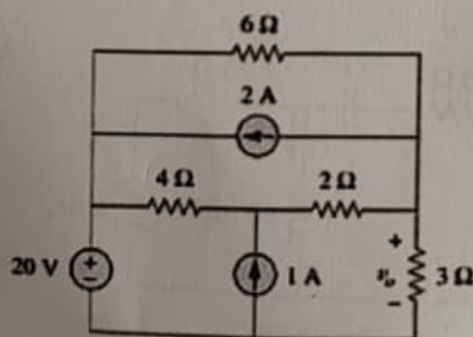


Figure 2

3. Find $i(t)$ in the circuit shown in Figure 3. For $t > 0$. Assume that the switch has been closed for a long time.

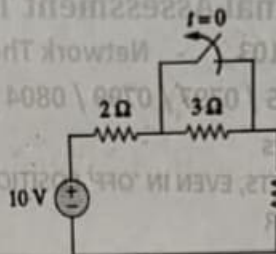


Figure 3

4. Find $v(t)$ for $t > 0$ in the RLC circuit shown in Figure 4. Assume that the switch has been closed for a long time.

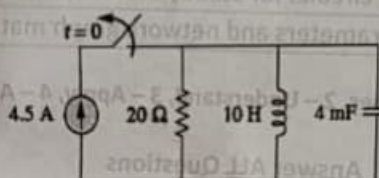


Figure 4

- 5.(a) Find the current I_0 in the circuit shown in Figure 5A by applying mesh analysis.

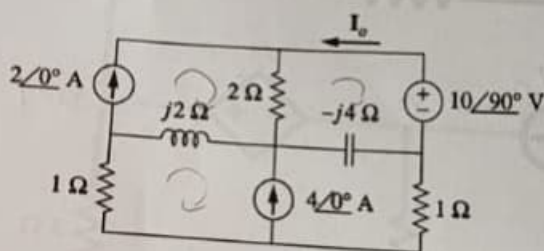


Figure 5A

OR

- 5.(b) For the circuit shown in Figure 5B, let $v_s = 100 \cos 2000t$ V. Determine:

- The apparent power supplied by the source v_s
- The power factor seen by the source v_s and state whether it is leading or lagging.

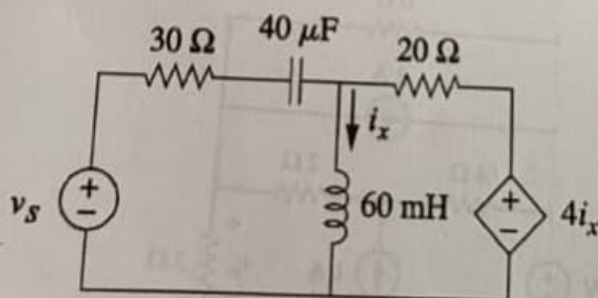


Figure 5B

6. Using Thevenin's theorem, calculate the voltage V_o for the circuit shown in Figure 6. CO3 BL3

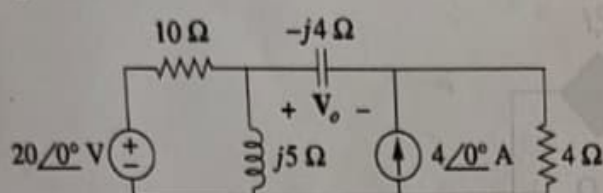


Figure 6

- 7.(a) Using Laplace transform, find i_1 and i_2 in the circuit in Figure 7A, when the dc voltage source is applied suddenly. Assume that the initial energy stored in the circuit is zero. CO4 BL3

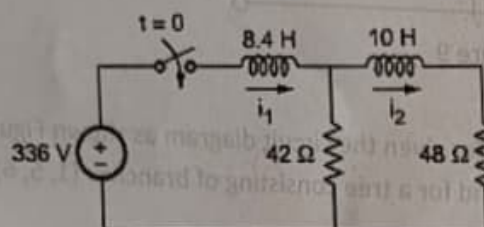


Figure 7A

OR

- 7.(b) Find the voltage across the series combination of inductor-capacitor (1F and 0.5 H) of circuit shown in Figure 7B using Fourier transform approach. CO4 BL3

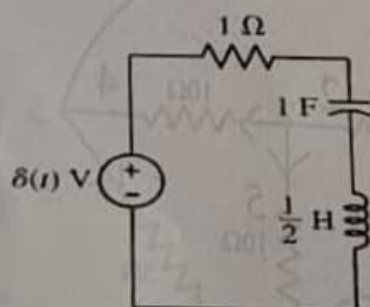


Figure 7B

8. Determine what type of filter shown in Figure 8. Calculate the corner frequency. CO4 BL3

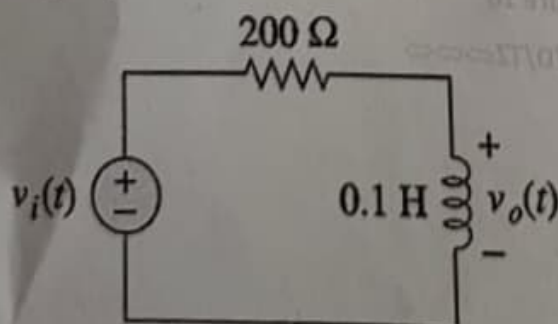


Figure 8

Determine the y -parameters for the two-port shown in Figure 9.

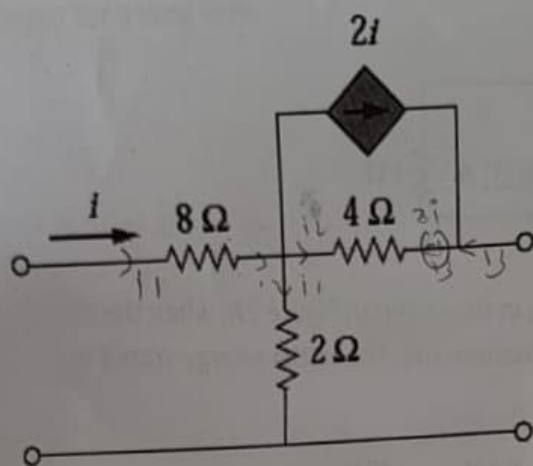


Figure 9

10. Construct a network graph for given the circuit diagram as shown Figure 10.
Find the incidence matrix and for a tree consisting of branches (1, 5, 6)

C05

- (i) draw tie set matrix
(ii) draw cut-set matrix.

[5]

[5]

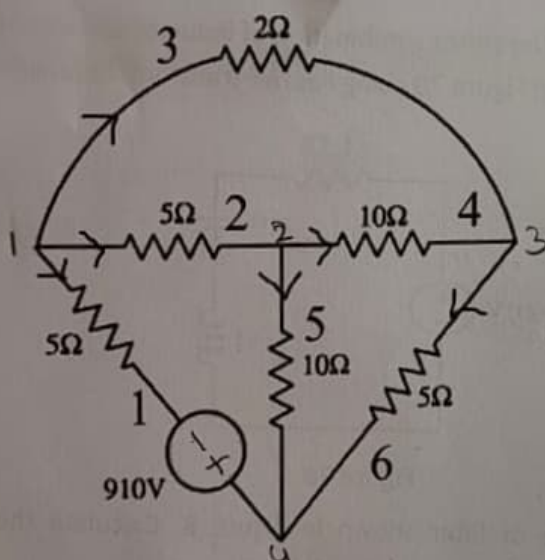


Figure 10

⇔⇔⇔ U/D/TZ ⇔⇔⇔