International University - VNUHCM
School of Electrical Engineering

Final Examination

Date: January 30, 2024; Duration: 120 minutes
Close book; **Offline,** One note (A4 size) is allowed**.**

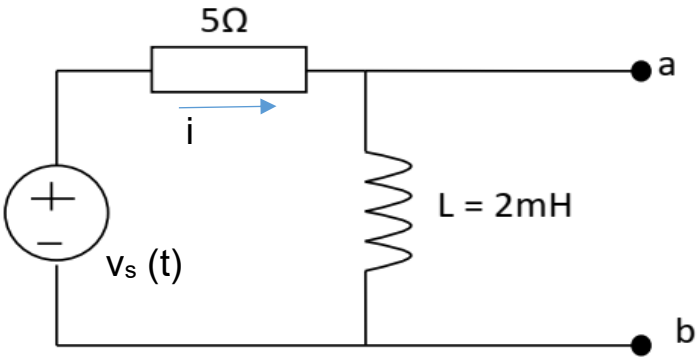
SUBJECT: Name of course (ID: EE051IU) Principles of Electrical Engineering I	
Approval by the School Signature Full name: Vo Tan Phuoc	Lecturer: Signature Full name: Tran Van Su
Proctor 1 Signature Full name:	Proctor 2 Signature Full name:
STUDENT INFO	
Student name: **Student ID:**	

INSTRUCTIONS: the total of point is 100 (equivalent to 40% of the course)

1. *Purpose:*
   - Test your knowledge in understanding the fundamentals of techniques of circuit analysis in AC; balanced three-phase circuits. (G1.3)
   - Test your knowledge in applying the techniques of circuit analysis to solve electrical engineering circuits (AC). (G2.1)
   - Test your knowledge in applying the techniques of circuit analysis to solve electrical engineering circuits balanced three-phase circuits. (G2.3)
   - Examine your skill in Designing, implementing real circuits. (G4.1)
2. *Requirement:*
   - Read carefully each question and answer it following the requirements.
   - Write the answers and draw models CLEAN and TIDY directly in the exam paper.

QUESTIONS

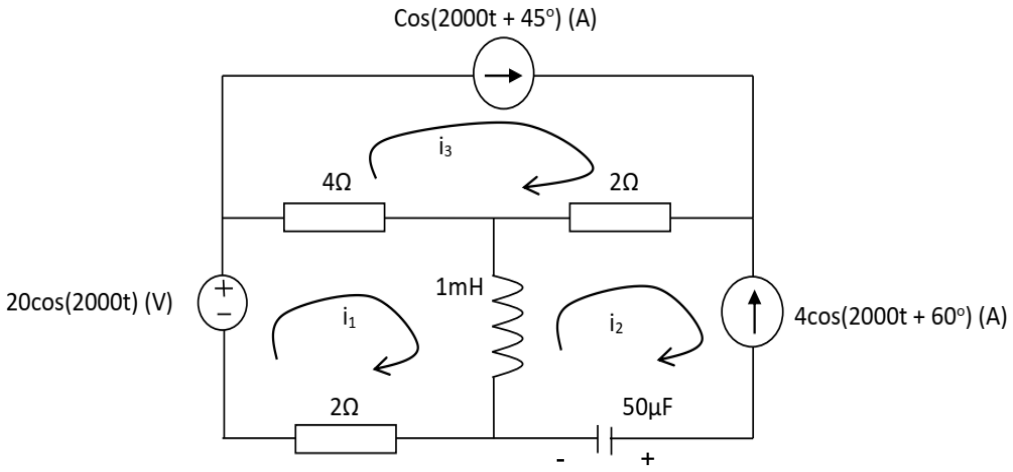
Question 1



The electric circuit is depicted in the figure with $v_s(t) = 20\cos(5000t)$ V

a. Show all the values of circuit elements in phasors.
b. Calculate i(t).
c. Compute and draw the Thevenin equivalent circuit in phasor for terminals a and b.
d. If a capacitor of 100μF is connected to terminal a and b, determine the voltage across the capacitor in time domain.

Question 2



The electric circuit is shown in the figure

a. Show the circuit in phasors.
b. Establish the mesh-current equations in phasor.
c. Determine I_1 in phasor and $i_1(t)$.
d. Determine voltage across the capacitor in frequency and time domains.

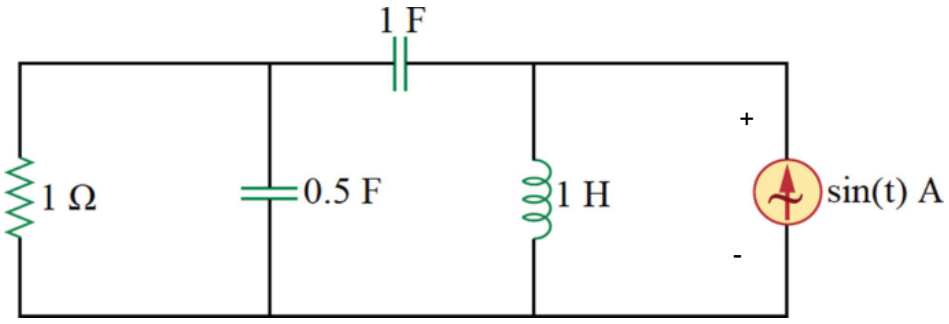
Question 3

The electric circuit is described below with four circuit elements and one current source sin(t) (A) with the voltage polarity given.

a. Use source transformation method to determine voltage across 1 Ω resistor in phasor and time domain.

b. What is the average power dissipated in 1 Ω.

c. What is the complex power S of the current source (sint) in the circuit.



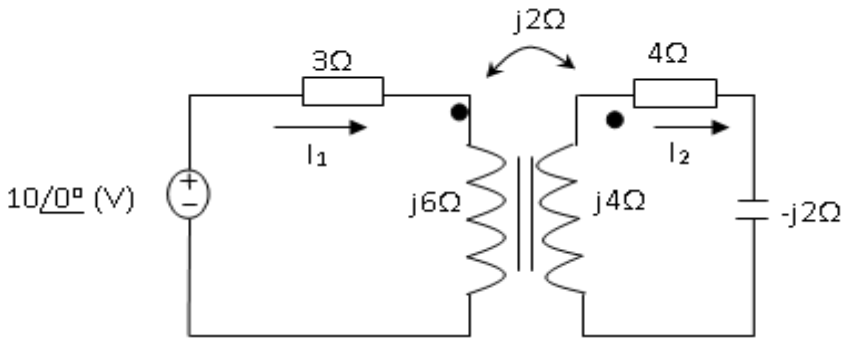
Question 4 (20 Marks)

A linear transformer is depicted in the figure

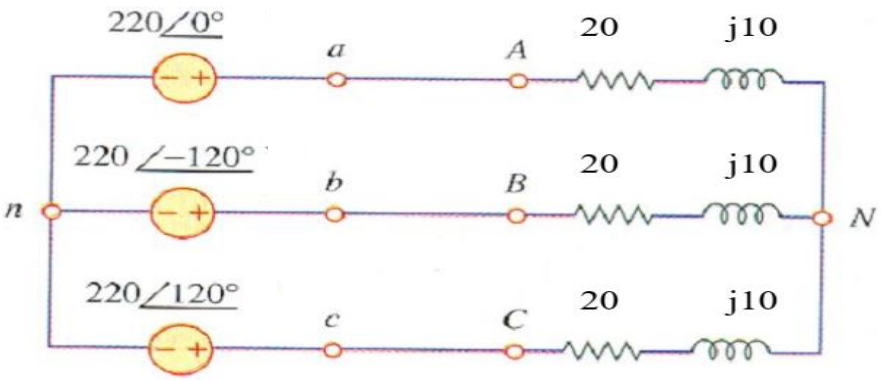
a. Calculate the reflected impedance from secondary circuit to the primary winding. (10 Marks)

b. What is the complex power of the voltage source. (5 Marks)

c. What is the voltage for secondary coil. (5 Marks)



Question 5 (20 Marks)



A three-phase circuit is described in the figure with voltage sources are 220 V_{rms}. Find

a. I_{aA}, I_{bB} and I_{cC}. (5 Marks)

b. V_{AN}, V_{BN} and V_{CN}. (5 Marks)

c. V_{AB}, V_{BC} and V_{CA}. (5 Marks)

d. Total average power of the three-phase load. (5 Marks)

- END OF QUESTIONS –