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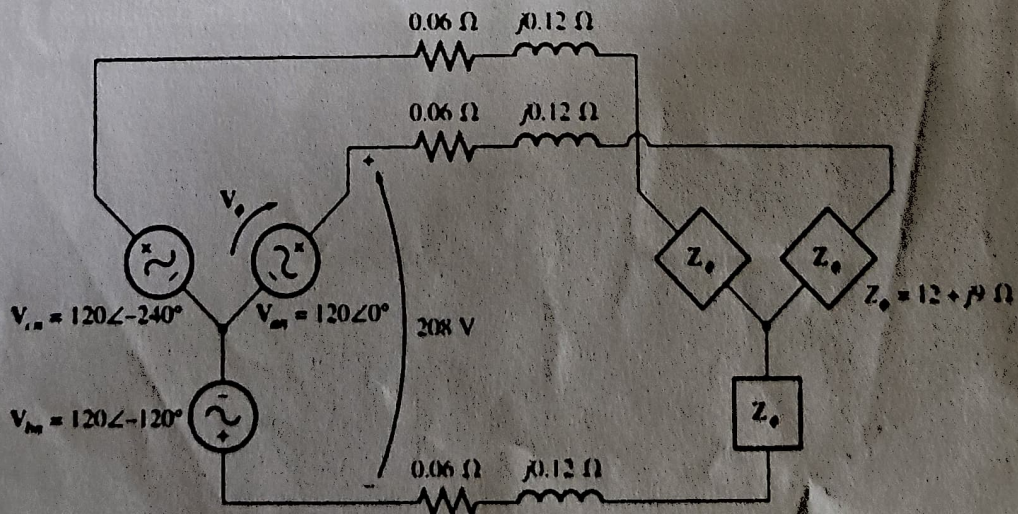
Vellore Institute of Technology
(Deemed to be University under section 3 of U.O. Act 1956)

Continuous Assessment Test – 2, October 2024

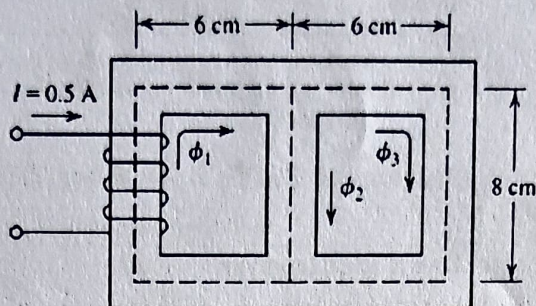
Programme	: B. Tech. CSE	Semester	: Fall 2024 - '25
Course	: Basic Electrical and Electronics Engineering	Code	: BEEE102L
Faculty	: D. R. Binu Ben Jose	Slot	: C1+TC1
	Common question across C1 slot	Class Number	: CH2024250103732
Time	: 90 minutes	Max. Marks	: 50

Answer ALL the Questions (5 x 10 = 50 Marks)

- The voltage across the load impedance $Z = 40 - j30 \Omega$ is $1200 \angle 30^\circ$ V at 50 Hz. (10)
 - Is the load inductive or capacitive? Justify and find the circuit elements in the load. (4)
 - Determine the power factor and the complex power delivered to the load. (3)
 - Compute real power, reactive power and apparent power supplied by the source. (3)
- A three-phase balanced system shown in figure has a load impedance of $Z = 12 + j9$ ohms per phase. (10)
 - Compute the RMS value of the line current and the phase voltages across the load. (5)
 - Draw the phasor diagram showing the line and phase voltages of the source. (5)



3. Calculate the flux in each limb of the core shown in figure. Given that the number of turns in the core is 500, cross sectional area of the core is $2\text{ cm} \times 2\text{ cm}$ and relative permeability of the core is 4000. Draw the electrical equivalent circuit of the magnetic circuit. (10)



4. a. A 10-turn circular coil has a radius of 5 cm. A flux density of 0.5 T is directed perpendicular to the plane of the coil. Evaluate the flux linking the coil and the flux linkages. (10)
(6)
- b. Suppose that the flux is reduced to zero at a uniform rate during an interval of 1 ms. Determine the voltage induced in the coil. (4)
5. a. Represent $(1011011.101)_2$ in base-10, base-8 and base-16 number system. (10)
(3)
- b. Convert and perform the signed binary arithmetic operation $(6.4)_8 + (D4.6)_{16}$. (3)
- c. Evaluate using $(+123)_{10} + (-68)_{10}$ using 2's complement 8-bit binary arithmetic. (4)