

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
 ORGANISATION OF ISLAMIC COOPERATION (OIC)
 DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

Mid-Semester Examination
 Course No.: EEE 4281
 Course Title: Basic Electrical Engineering

Summer Semester, A. Y. 2021-2022
 Time: 90 Minutes
 Full Marks: 75

There are 3 (three) questions. Answer all 3 (three) questions. The symbols have their usual meanings. Programmable calculators are not allowed. Marks of each question and corresponding COs and POs are written in the brackets.

1. a) State the theorem of superposition for DC circuit analysis. Clarify the reason(s) for implementing this theorem. Describe the steps to obtain the total response of a linear circuit using the superposition theorem. 12
(CO1, PO1)
- b) Determine the unknown currents from the circuit shown in Figure 1 using the superposition principle. 13
(CO1, PO1)

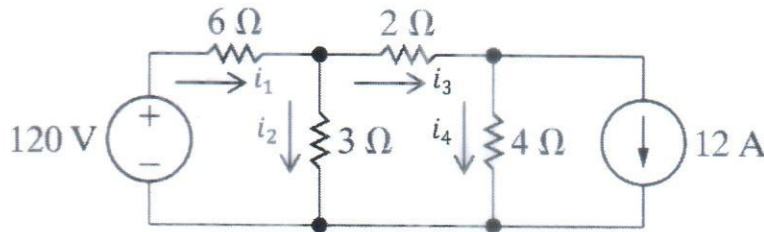


Figure: 1

2. a) State Faraday's law of electromagnetic induction and discuss the relevance of Lenz's law to this phenomenon. Also, deduce an equivalent electrical circuit from the given magnetic system as shown in Figure 2(a). (all the dimensions are in centimeters) 12
(CO3, PO3)

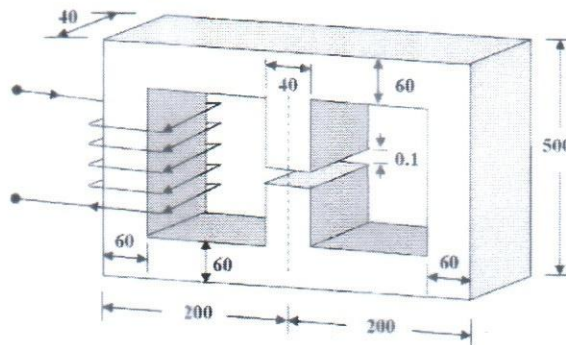


Figure: 2(a)

- b) Find the current in the phasor domain (I) from Figure 2(b). 13
(CO2, PO2)

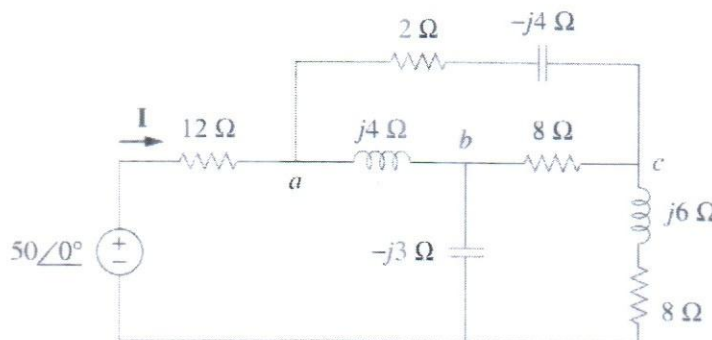


Figure: 2(b)

3. a) An academic building of IUT has recently started the renovation by rewiring the electrical lines and requested your expert opinion regarding the choice of poly-phase electrical connection. State your preferred opinion and justify your answer. **12**
(CO4, PO4)
- b) For the circuit shown in Figure 3, determine the line voltage, line current, phase voltage, and phase current of the source and load, respectively. (all the symbols have their usual meaning) **13**
(CO4, PO4)

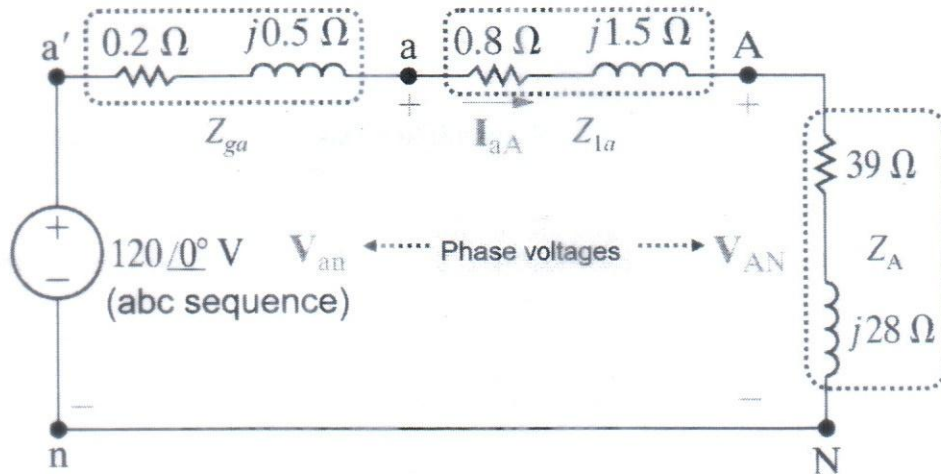


Figure: 3