



FIJI NATIONAL UNIVERSITY

COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY
SCHOOL OF ELECTRICAL & ELECTRONIC

ENGINEERING

TRADE DIPLOMA IN ELECTRICAL ENGINEERING
STAGE 4

EEE535–Electro- Technology

Supplementary Examination

SEMESTER 1 - 2017.

Total marks-100%-----Duration: 2Hrs 10 Minutes

DAY/DATE: _____ TIME: _____ ROOM: As per timetable.

INSTRUCTIONS TO STUDENTS

1. *You are allowed 10 minutes Extra reading time during which you are NOT to write.*
2. *Begin each answer on a fresh page and use both sides of the sheet.*
3. *Write your candidate-number at the top of each attached sheet.*
4. *Insert all written sheets in their correct sequence and secure with string.*
5. *For all sheets of paper on which rough/draft work has been done, cross it though and you MUST ATTACH to your answer scripts.*
6. *Write clearly the number(s) of the question(s) attempted on the top of each sheet.*
7. *Answer all Questions*
8. *Show all workings where necessary.*
9. *Do not use programmable calculators, especially the ones that does the conversions of number systems.*
10. ***CHECK YOUR WORK BEFORE YOU LEAVE THE ROOM!***

Attempt all the questions

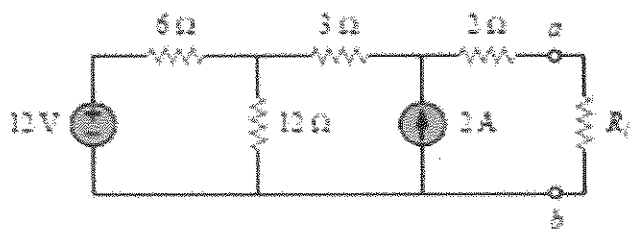
Question 1

State the following:

- a) Thevenin's Theorem. (3marks)
- b) Norton's Theorem. (3marks)
- c) Maximum power transfer theorem. (4marks)

Question 2

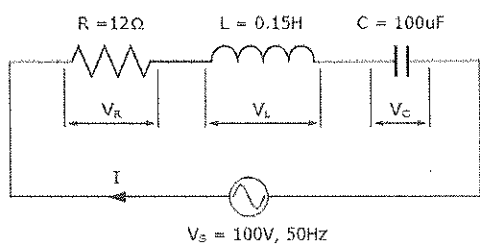
a) Reduce the circuit shown to its Thevenin and Norton equivalent circuits. (10 marks)



- b) Find the value of RL for maximum power transfer in the circuit (5 marks)
- c) Find the maximum power. (5 marks)

Question 3

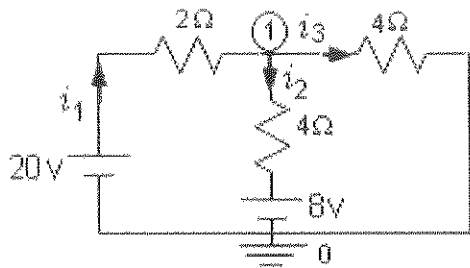
A series RLC circuit containing a resistance of 12Ω , an inductance of $0.15H$ and a capacitor of $100\mu F$ are connected in series across a $100V$, $50Hz$ supply. Calculate the total circuit impedance, the circuits current, power factor



(5 marks)

Question 4

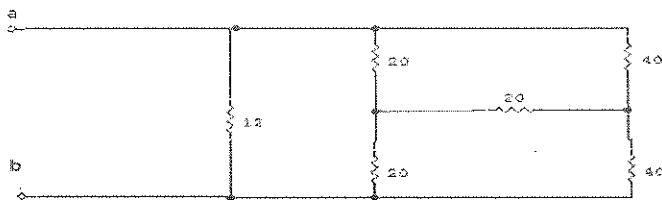
Use nodal analysis to find the voltage at each node of this circuit.



(10 marks)

Question 5

Execute $Y \rightarrow \Delta (R_{ab})$

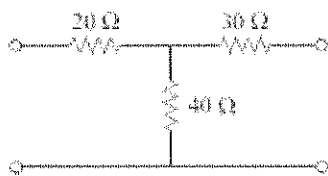


(10 marks)

Question 6

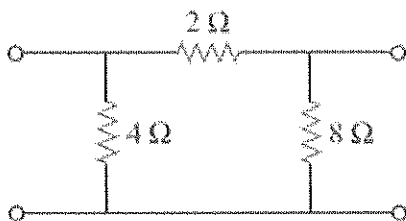
a) Given the following circuit. Determine the Z parameters

(10 marks)



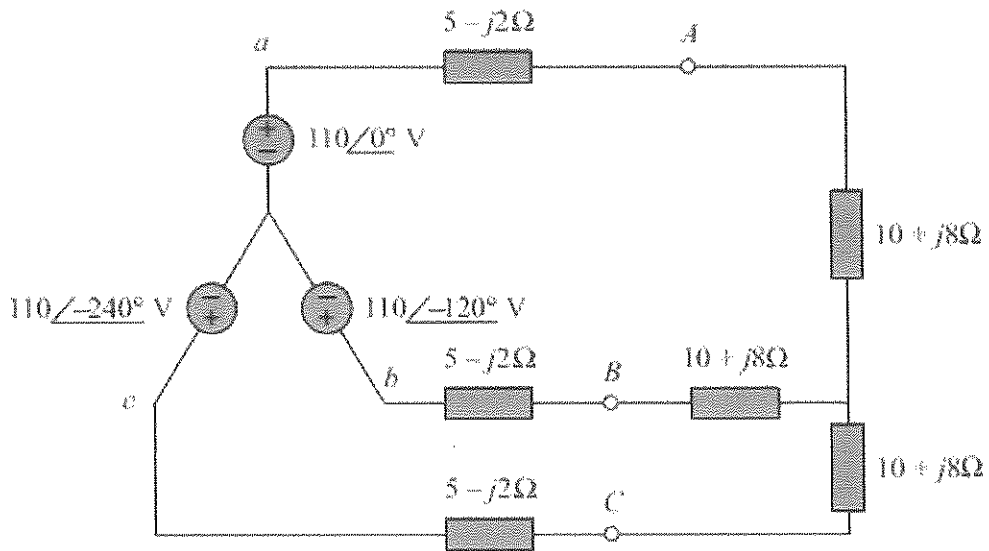
b) Obtain y parameters for the network shown

(10 marks)



Question 7

Calculate the line currents in the three wire Y-Y system in the figure shown below



(10marks)

Question 8

Determine the Laplace Transform of each of the following functions.

a) t^2

(1marks)

b) e^{at}

(2 marks)

c) $e^{at} \sin wt$

(2 marks)

Question 9

a) Find the inverse Laplace transform of $F(s) = \frac{1}{s + 2}$

(5 marks)

b) Find the Laplace transform of $\int_0^t \cos(at) dt$

(5marks)

-----THE END-----