



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

ENGINEERING

TRADE DIPLOMA IN ELECTRICAL ENGINEERING
STAGE 5

EEE571—ELECTRICAL POWER NETWORKS & THEOREMS

TRIMESTER 2 - 2016.

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

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

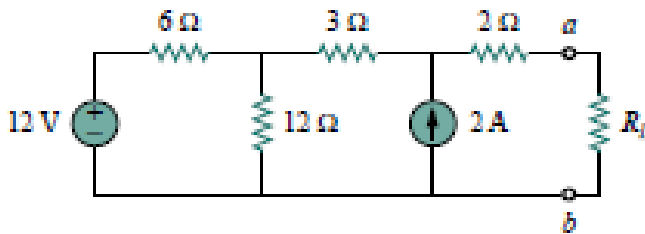
INSTRUCTIONS TO STUDENTS

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

a) Reduce the circuit shown to its Thevenin and Norton equivalent circuits. (15 marks)

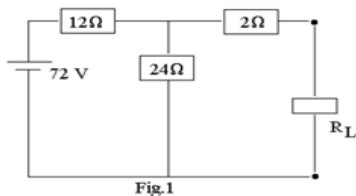


b) Find the value of R_L for maximum power transfer in the circuit (5 marks)

c) Find the maximum power. (5 marks)

Question 2

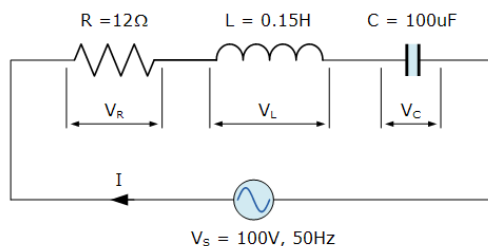
For the circuit shown in Fig. 1, find the value of R_L for maximum power transfer. What will be the value of maximum power?



(5 marks)

Question 3

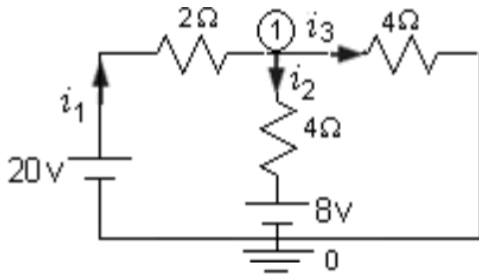
A series RLC circuit containing a resistance of 12Ω , an inductance of 0.15H and a capacitor of $100\mu\text{F}$ are connected in series across a 100V , 50Hz supply. Calculate the total circuit impedance, the circuit's current, power factor



(5 marks)

Question 4

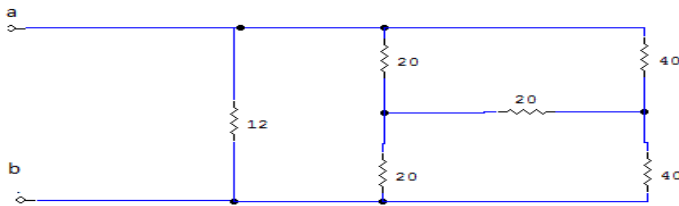
Use nodal analysis to find the voltage at each node of this circuit.



(10 marks)

Question 5

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

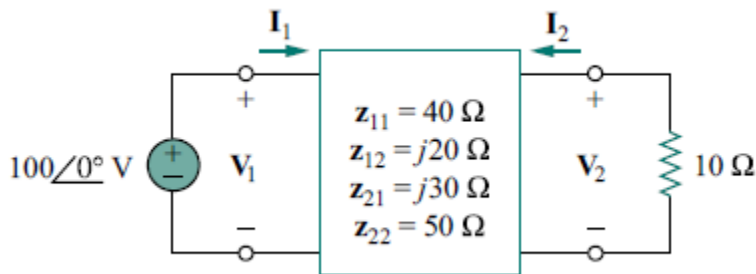


(10 marks)

Question 6

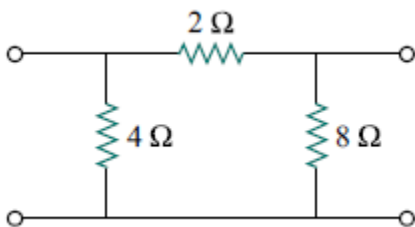
a) Given the following circuit. Determine the Z parameters

(10 marks)



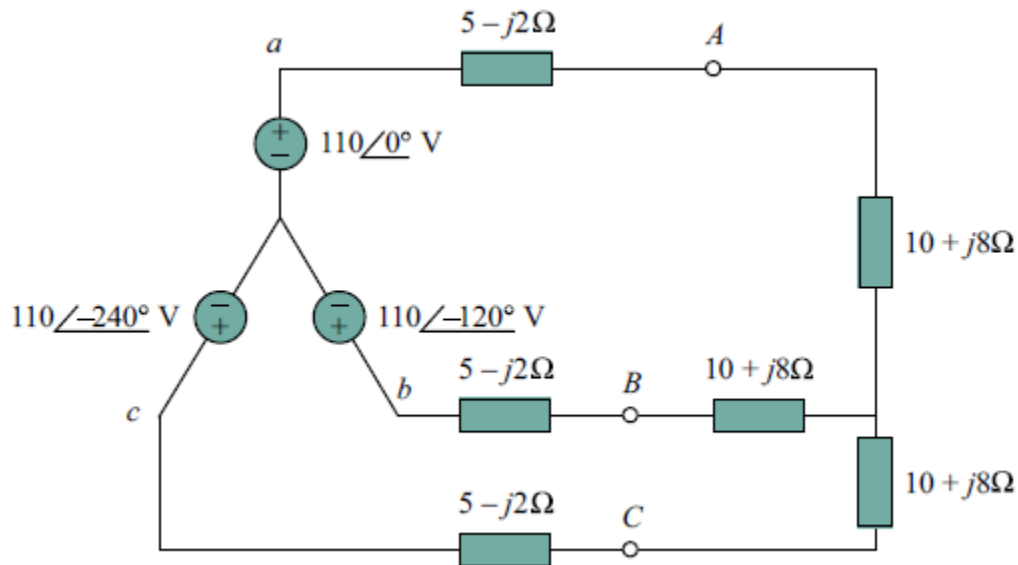
b) Obtain y parameters for the network shown

(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-----