



**COLLEGE OF ENGINEERING, SCIENCE AND TECHNOLOGY
SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING**

BACHELOR OF ENGINEERING PROGRAMME, YEAR 2 (BENG 2)

EEE681 ELECTROTECHNOLOGY

FINAL EXAMINATION (SEMESTER 1, 2015)

DATE/TIME/ROOM – Refer to Timetable

INSTRUCTIONS TO CANDIDATES

1. You are allowed 10 minutes extra time during which you are not to write.
2. Begin each answer on a fresh new page and use both sides of the sheets.
3. Write your identification number on the top of each attached sheet.
4. Insert all written foolscaps, graph paper, drawing paper etc. in their correct sequence and secure with string provided.
5. For all sheets of paper in which rough work has been done, cross it through and you must attach to your answer script.
6. Write clearly the number(s) of the question(s) attempted on the top of each sheet.
7. *ANSWER ONLY TEN QUESTIONS.*

1. Determine the resistance between nodes A & B and current supplied by the 24 Volt supply shown in Fig. 1.

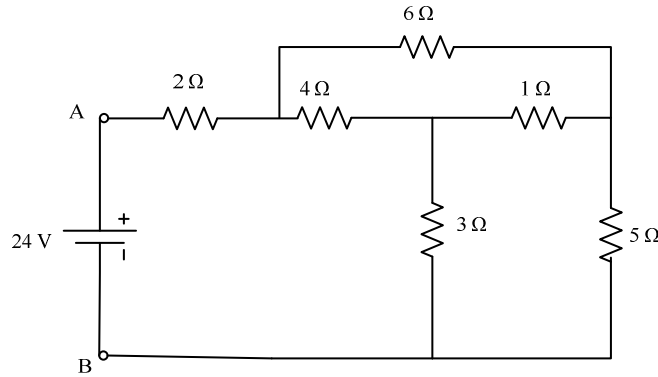


Fig. 1

2. Determine the current through all branches and power supplied by the voltage source shown in Fig. 2.

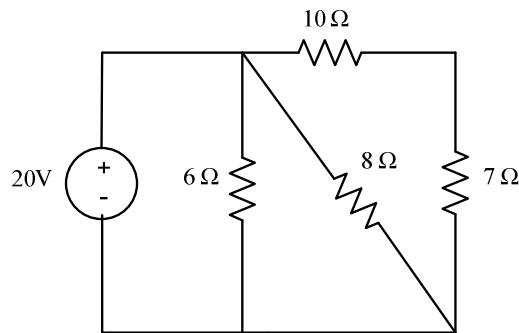


Fig.2

3. Determine the current through branch AB by Norton's theorem or Thevenin's theorem.

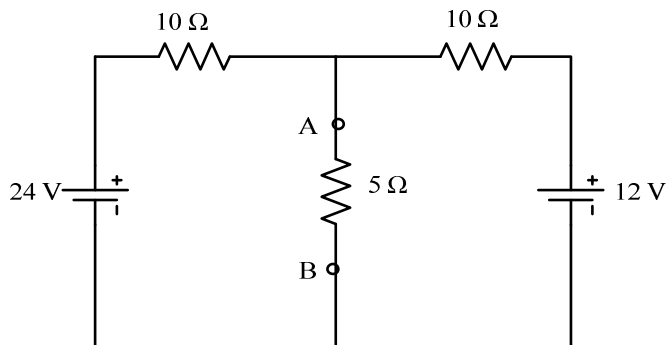
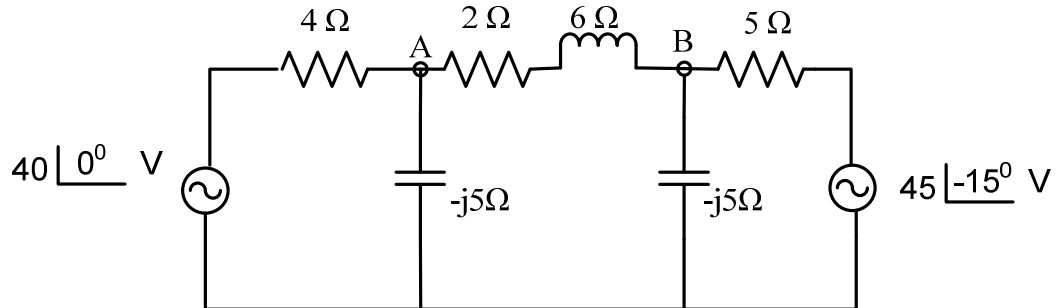
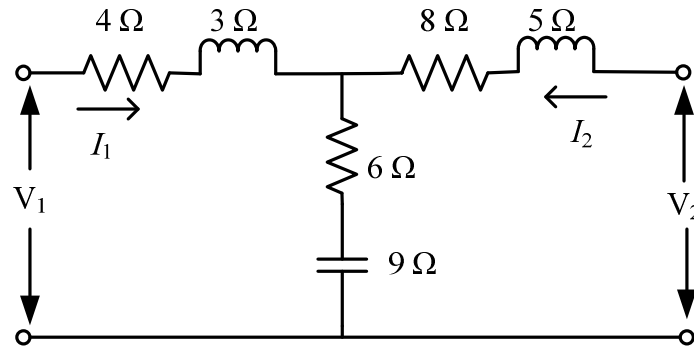


Fig. 3

4. Consider the circuit shown in the figure, determine the voltage drop V_{AB} .



5. A coil having an inductance of 50 mH and resistance of 10 ohm is connected in series with a 25 microfarad capacitor across a 200V ac supply. Calculate (a) resonant frequency of the circuit (b) current flowing at resonance (c) value of the quality factor.
6. Prove that the power in a balanced three phase circuit can be measured from the readings of two wattmeter. Draw the relevant circuit diagram and also derive the expression for the determination of power factor.
7. Discuss any four terms associated with circuit analysis
- Norton's Theorem
 - Thevenin's Theorem
 - Superposition Theorem
 - Maximum Power Transfer Theorem
 - Mesh Current Analysis
8. A balanced star connected load of $(3 + j 4) \Omega$ per phase is connected to a balanced star connected three-phase 440 V supply. Find line current, power factor, active power, reactive power and total volt ampere.
9. Phase voltages and current of a star connected inductive load is 150 V and 25 A. Power factor of the load is 0.707 (lagging). Assuming that the system is three wire and power is measured using two wattmeter methods. Find the readings of the wattmeter.
10. Consider the circuit , determine
- Impedance parameter
 - Admittance parameter
 - Hybrid parameter
 - Transmission parameter



11. The unbalanced three-phase load voltages of a star connected circuit are $V_{an} = 312.53 \angle 8.69^\circ \text{ V}$, $V_{bn} = 157.4 \angle -103.81^\circ \text{ V}$ and $V_{cn} = 250.1 \angle 98.64^\circ \text{ V}$. Obtain the zero sequence and positive sequence components.

12. Determine the resistance between nodes A & B by using star delta transformation method given in Fig. 12 (a) & Fig. 12 (b).

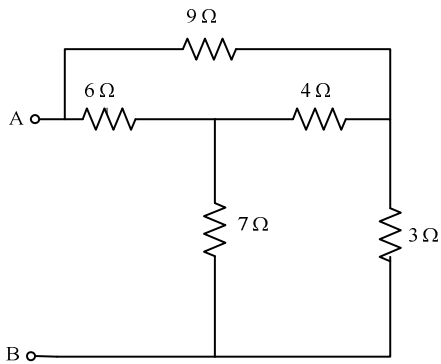


Fig. 12(a)

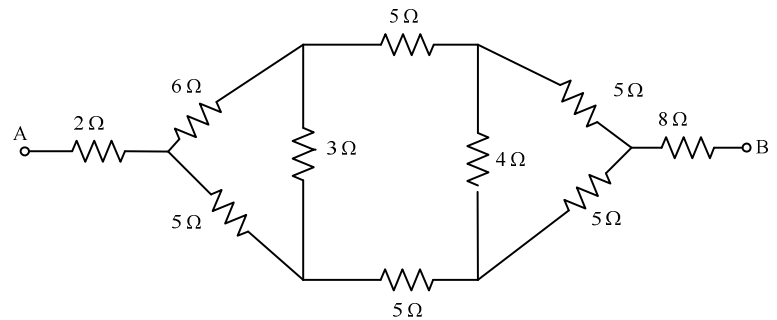


Fig. 12(b)

[THE END]