B.E./B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2012

ELECTRICAL AND ELECTRONICS ENGINEERING

II SEMESTER – (REGULATIONS 2008)

EE 9151 – ELECTRIC CIRCUIT ANALYSIS

Time:3 hrs Max Marks:100

Answer ALL Questions

Part A – (10×2=20)

1. State Kirchoff's laws
2. Define form factor
3. Mention the advantage of Laplace Transform
4. Define time constant
5. Distinguish between Real power and Reactive power
6. Draw impedance triangle and explain
7. State Millman's theorem
8. Write down the condition for which maximum power transfer occurs.
9. Define coefficient of coupling
10. What do you mean by balanced and unbalanced load?

Part B – (5×16=80)

11. What is the power loss in the 10 Ω resistor in the network, Figure 1? (16)

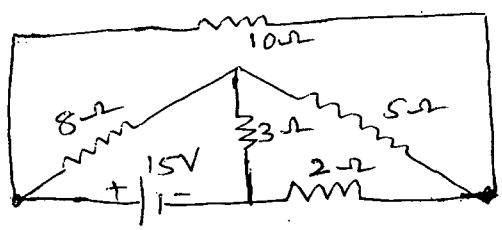

Fig-1

12. a. (i) Derive an expression for transient response of RL series circuit with DC excitation. (10)

(ii) Find the current in a series RL circuit having R=2 Ω and L=10H while a DC voltage of 100 V applied. What is the value of this current after 5 sec of switching on? (6)

OR

b. (i) Derive an expression for transient response of RC series circuit with DC excitation. (10)

(ii) A DC constant voltage source feeds a resistance of 2000 kΩ in series with a 5 μF capacitor. Find the time taken for the capacitor when the charge retained will be decayed to 50% of the initial value, the voltage source being short circuited. (6)

13. a. (i) A series RL circuit has R=25Ω and X_L=32Ω. It is connected in parallel to a capacitor of 100 μF and the combination is connected across a 200V, 50Hz supply. Find the current in each branch. Draw the vector diagram showing total current. (10)

(ii) Explain and draw power triangle for capacitive and inductive loads (6)

OR

b. (i) Derive the expressions for current, power factor and frequency for series RLC resonance circuit. (10)

(ii) What is the resonance frequency and Q factor of a series RLC circuit where R= 10 Ω, L=25 mH and C=100 μF. (6)

14. a.(i) State Superposition's theorem. (6)

(ii) Using above theorem, find current I in the circuit shown in Figure 2. (10)

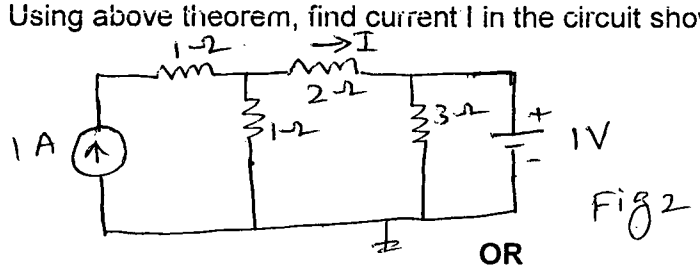

Fig 2

OR

b. (i) State Norton's theorem. (6)

(ii) Using above theorem, find power loss in 1 Ω resistor in the Figure 3. (10)

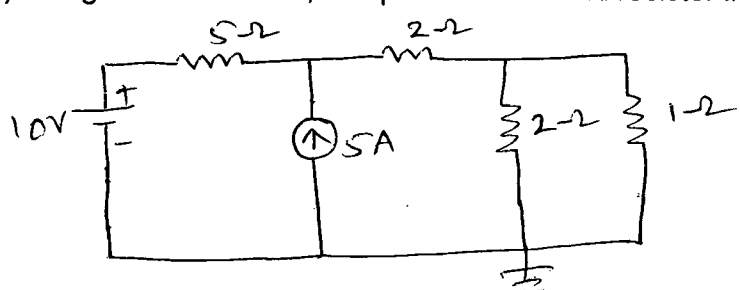

Fig. 3

15. a.Explain two wattmeter method for measurement of power. Derive the required equations. (16)

OR

b. Derive the relationship between line and phase voltages and currents in star connection. Draw the phasor diagram also. (16)