



**B.E.(Full Time) DEGREE END SEMESTER EXAMINATIONS, APR/MAY2012**  
**ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH**  
**SECOND SEMESTER**  
**EC182 – CIRCUIT ANALYSIS**  
**(REGULATIONS 2004)**

**Time: 3 Hours**

**Max.Marks: 100**

**Answer ALL questions**  
**PART-A**

**(10X2=20 Marks)**

1. If 20 ohm and 10 ohm resistances are connected in parallel calculate the value of the equivalent resistance.
2. Distinguish between mesh current method and node voltage method.
3. Draw the Norton's equivalent circuit.
4. What is the condition for maximum power transfer?
5. What is sinusoidal time variation?
6. Define power factor.
7. Write the formula for Q factor.
8. Define unit step function.
9. Write the dual quantity of resistance and mesh current.
10. Define tree of a connected graph.

**PART-B**

**(5X16=80 Marks)**

- 11.(i) Prove Kirchoff's current law using one battery and four resistors. (8)
  - (ii) Give the importance of voltage source, KVL and Ohm's law. (8)
  - 12.(a) State and prove the following theorems.
    - (i) Superposition theorem (8)
    - (ii) Millman's theorem (8)
- OR**
- 12.(b)(i) With suitable illustration explain the features of compensation theorem. (8)
  - (ii) Describe how duality theorem is useful for circuit analysis. (8)
  - 13.(a)(i) List the various steps of general method of determining the steady state response using phasors. (8)
  - (ii) Draw the phasor diagrams for the series RLC circuit at three different frequencies. (8)
- OR**
- 13.(b)(i) Compare average power and apparent power. (8)
  - (ii) Compare instantaneous power and complex power. (8)

14.(a)With mathematical substantiation describe the step voltage step current responses of RL circuit. (16)

**OR**

14.(b)Describe the step voltage response of the following circuits.

(i)RC circuit (8)

(ii)RLC circuit (8)

15.(a)(i)Write the procedure to be followed in finding the dual of a network. (8)

(ii)Explain the properties of incidence matrix. (8)

**OR**

15.(b)(i)Write the fundamental features of cut-set matrix. (8)

(ii)Discuss the relationship between link currents and tie-set schedules. (8)

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