Hall Ticket Number:

Code No.: 13404 O

## VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD B.E. (ECE) II Year I-Semester Backlog Examinations, December-2017

## **Basic Circuit Analysis**

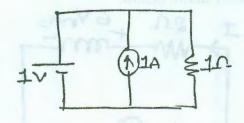
Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

## Part-A $(10 \times 2 = 20 \text{ Marks})$

- 1. Distinguish between independent and dependent sources.
- 2. Find power consumed by the resistor in the circuit shown below.



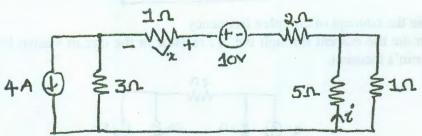
- 3. Give examples of first and second order circuits.
- 4. Define transient and steady state response.
- 5. What is power triangle? Explain.
- 6. State maximum power transfer theorem for circuits containing reactive elements.
- 7. Does a series RLC circuit works as voltage amplifier? If yes, prove it.
- 8. Define self inductance 'L', mutual inductance 'M' and coefficient of coupling, 'K,.
- 9. Differentiate between tie-set and cut-set matrix.
- 10. What are the properties of incidence matrix?

Part-B 
$$(5 \times 10 = 50 \text{ Marks})$$

11. a) Give the statement of Superposition theorem and write its importance.

3 7

b) Find i and  $V_x$  in the following circuit using nodal analysis.

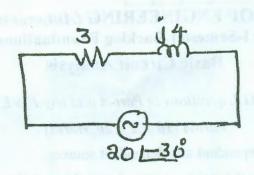


- 12. a) Bring out integro-differential equations for second order series and parallel circuits.
  - b) A d.c voltage of 100V is applied to a coil having  $R=10\Omega$  and L=10H, with switch closed at t=0. Find the current through the inductor for  $t \ge 0$ .
- 13. a) In the following circuit, find real power, imaginary power and complex power.

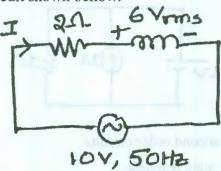
5

7

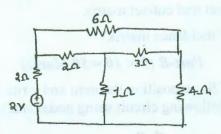
4



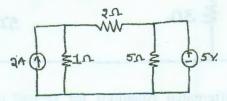
Find current I in the circuit shown bellow.



- 5 Find the bandwidth of series RLC circuit in terms of quality factor and resonant frequency. 5
  - Write the properties of resonance of parallel RLC circuit.
- Write tie-set schedule and calculate branch currents and branch voltages for the circuit shown below using tie-set analysis.



- 3 b) Explain the concept of complex frequency.
- 16. a) Determine the current through the  $5\Omega$  resistor in the circuit shown below using Thevenin's theorem.



- b) Find transient voltage response of series RC circuit having DC excitation.
- 17. Answer any two of the following:
  - 5 Transient and steady response of series RL circuit.
  - 5 Magnetic coupling circuits.
  - 5 Impedance and admittance functions.

\*\*\*\*