VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD

## B.E. (ECE) II Year I-Semester Backlog Examinations, December-2017

Basic Circuit Analysis
Time: $\mathbf{3}$ hours
Note: Answer ALL questions in Part-A and any FIVE from Part-B
Part-A (10×2 $=20$ 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?

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

11. a) Give the statement of Superposition theorem and write its importance.
b) Find $i$ and $\mathrm{V}_{\mathrm{x}}$ in the following circuit using nodal analysis.

12. a) Bring out integro-differential equations for second order series and parallel 4 circuits.
b) A d.c voltage of 100 V is applied to a coil having $\mathrm{R}=10 \Omega$ and $\mathrm{L}=10 \mathrm{H}$, with switch 6 closed at $t=0$. Find the current through the inductor for $t \geq 0$.
13. a) In the following circuit, find real power, imaginary power and complex power.

b) Find current I in the circuit shown bellow.

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

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:
a) Transient and steady response of series RL circuit. 5
b) Magnetic coupling circuits.
c) Impedance and admittance functions.
