Hall Ticket Number:

Code No.: 21312 S

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. II Year (E.C.E.) I-Semester Supplementary Examinations, May/June-2017

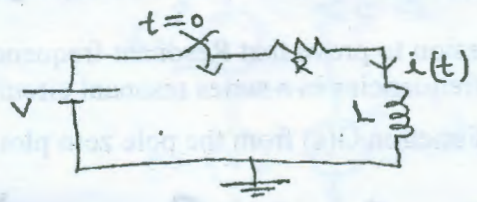
Basic Circuit Analysis

Time: 3 hours Max. Marks: 70

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

Part-A (10 X 2=20 Marks)

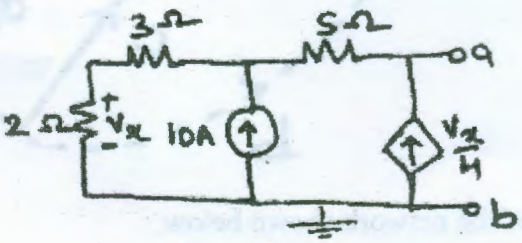
1. State and Explain the Volt-Ampere relationships for R, L and C components.
2. Distinguish between Independent and dependent sources.
3. State and explain Norton's theorem.
4. Find the expression for current i(t) in the circuit shown below for t > 0.



5. "The Current through an inductor cannot change instantaneously". Explain and justify the statement.
6. A coil with 1500 turns surrounds a magnetic circuit which has a reluctance of 6×10^{-6} AT/wb. Calculate the inductance of the coil.
7. Define power Factor.
8. Define Q-factor of a resonant circuit.
9. What is Duality? Sketch dual of simple RLC network.
10. State properties of Tieset analysis.

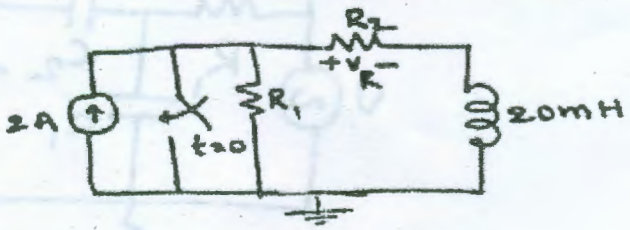
Part-B (5 × 10 = 50 Marks)

11. a) Obtain Thevinen's equivalent network across the terminals a and b for the network shown below. [6]



b) State and prove Reciprocity theorem using a simple network. [4]

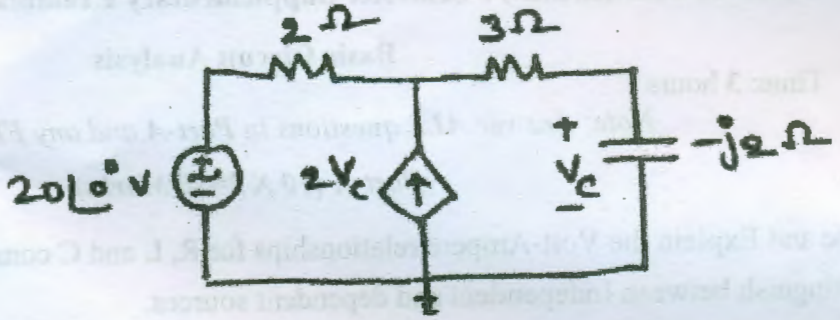
12. a) Select values of R_1 and R_2 in the circuit so that $V_R(0+) = 10$ V and $V_R(\text{lms}) = 5$ V. [7]



b) Illustrate the Steady state behaviour of Inductor and Capacitor. [3]

Contd...2

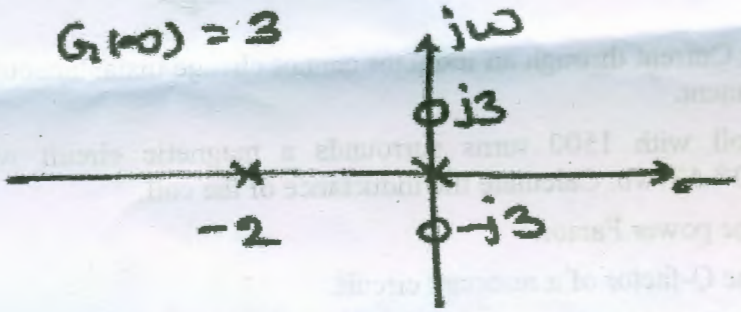
13. a) Determine Average power supplied by dependent source in the circuit. [5]



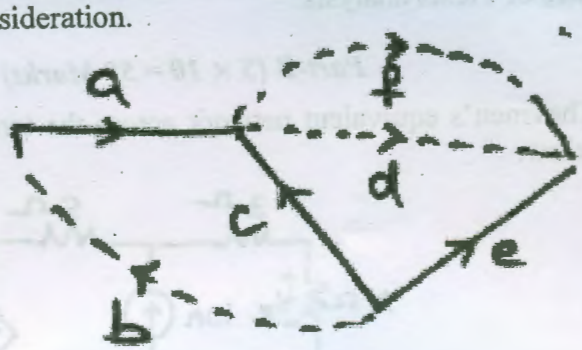
b) Find complex voltage across series combination of a 500 Ω resistor and a 900 mH inductor if complex current $8e^{j3000t}$ mA flows through two elements in series. [5]

14. a) Derive an expression to prove that Resonant frequency is equal to geometric mean of two half power frequencies in a series resonant circuit. [6]

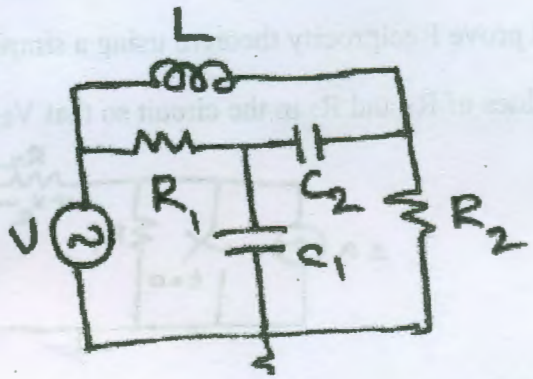
b) Obtain transfer Function G(s) from the pole zero plot. [4]



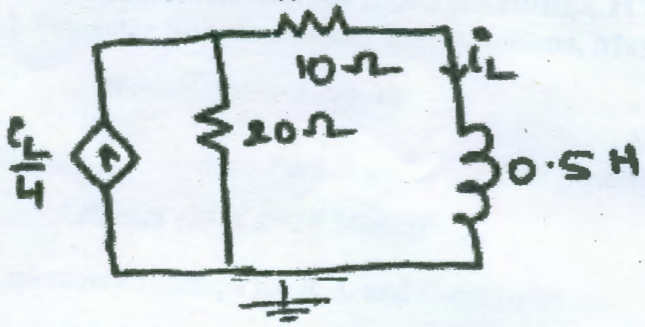
15. a) Obtain Fundamental Tie-Set matrix of the network graph shown below taking tree branches a,c,e into consideration. [5]



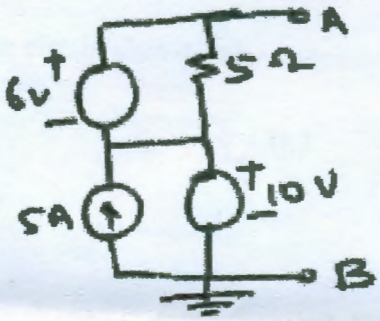
b) Obtain dual of the network shown below. [5]



16. a) If $I_L(0) = 10$ A in the circuit shown, Find $I_L(t)$ for $t > 0$. [5]



b) Determine voltage across terminals AB in the circuit shown below: [5]



17. Write short notes on any **two** of the following:

a) Reactive power [5]

b) Co-efficient of Coupling [5]

c) ZIR and ZSR. [5]

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