

II B. Tech I Semester Supplementary Examinations, May - 2018

NETWORK ANALYSIS

(Com to ECE, EIE and ECC)

Time: 3 hours

Max. Marks: 70

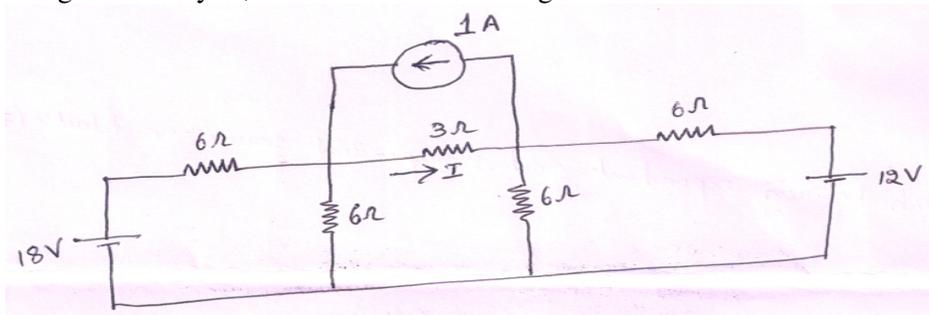
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**

PART -A

1. a) Explain the terms i) Resistivity and ii) Conductivity and give its units (2M)
- b) Define the following terms w.r.t network Graph theory: (3M)
 i) Connected graph ii) Tree iii) Links
- c) Explain the term Quality factor of a circuit in resonance (2M)
- d) State the Norton's Theorem (3M)
- e) What are the conditions to be fulfilled for reciprocity of a two port network (2M)
- f) Distinguish between Homogeneous and Non -Homogeneous equations (2M)

PART -B

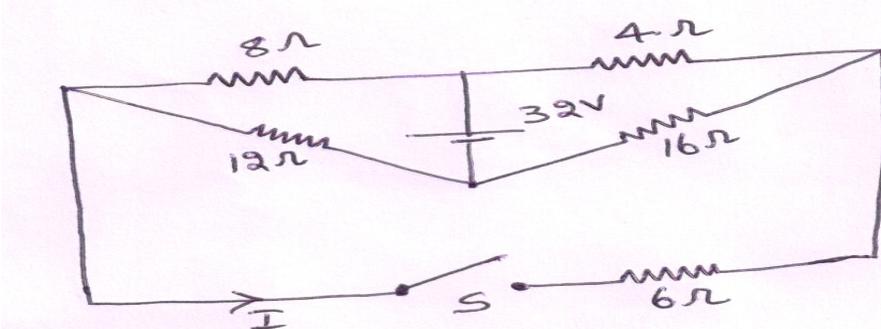
2. a) Explain the principle of Duality with an example (7M)
- b) Using node analysis, find I for the circuit diagram shown below: (7M)



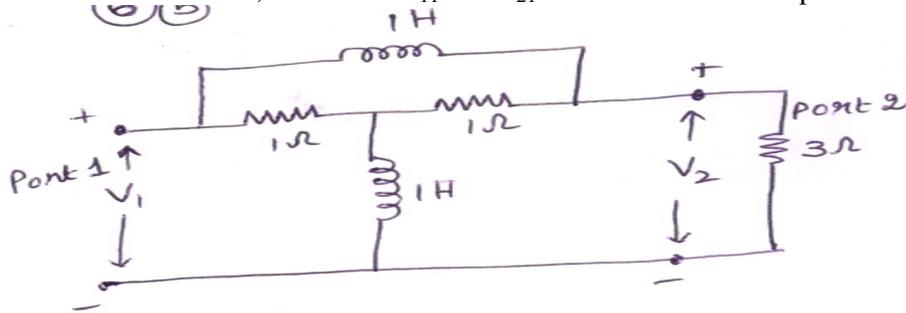
3. a) Prove that in a pure inductive circuit the active power supplied over a complete cycle averages out to Zero. (7M)
- b) A certain inductive coil takes 15A when the supply voltage is 230 V, 50 Hz. If the frequency is changed to 40 Hz, the current increases to 17.2 A. Calculate the resistance and the inductance of the coil. (7M)
4. a) Derive the equation for Equivalent inductance , when two inductors are coupled in series opposing and mutual inductance exists between them (6M)
- b) A coil of resistance 50Ω and inductance 9H is connected in series with a capacitor and is supplied at constant voltage and variable frequency source. If the maximum current is 1A at 75 Hz determine the frequencies when the current is 0.5A. (8M)



5. Use Thevenin's theorem to find the current I that will flow through the switch S in the circuit shown in figure, when S is closed. Specify the direction as well as the magnitude of I (14M)



6. a) Explain the interrelationships between Z-parameters in terms of ABCD - parameters for a two port network (7M)
 b) For the network shown, determine Y_{11} and Y_{21} with $3\ \Omega$ load across port 2. (7M)



7. a) Derive the step response of RL circuit in s-domain (5M)
 b) The network shown in figure, is initially under steady state condition. The switch is opened at $t=0$. Find the voltage across inductance as a function of t . (9M)

