

B. TECH. SEM - III (ELECTRONICS) 2014 COURSE) (CBCS) :
SUMMER - 2018
SUBJECT: CIRCUIT THEORY

Day: Friday
Date: 25/05/2018

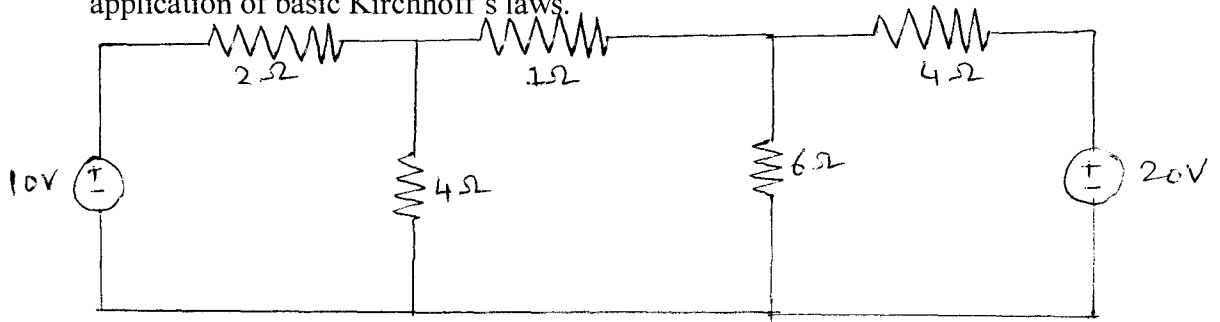
S-2018-2248

Time: 02.30 PM TO 05.30 PM
Max. Marks: 60

N.B:

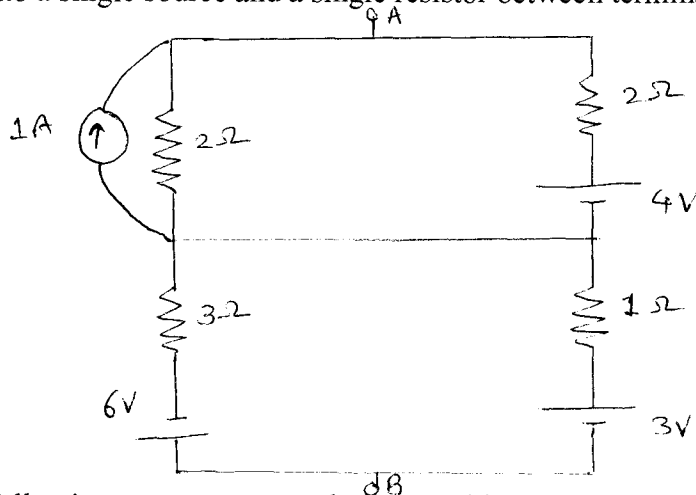
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Neat diagram must be drawn **WHEREVER** necessary.
- 5) Assume suitable data **WHEREVER** necessary.

- Q.1 a)** State and explain KVL and KCL (05)
b) Calculate the current passing through 6Ω resistance of a given network by application of basic Kirchhoff's laws. (05)



OR

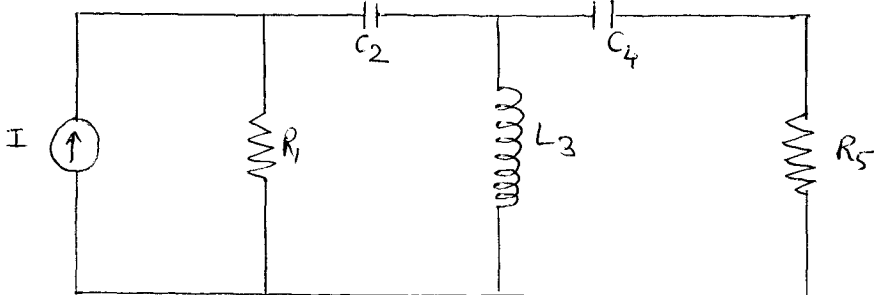
- Q.1** What is the importance of source transformation? Reduce the network shown in fig. into a single source and a single resistor between terminals A and B. (10)



- Q.2** Define following terms w.r.t. graph theory with example: (10)
- | | | |
|----------------------|----------------------|--------------------|
| i) Planar graph | ii) Non-planar graph | iii) Subgraph |
| iv) Path | v) Connected graph | vi) Rank of graph |
| vii) Loop or Circuit | viii) Tree | ix) Co-tree |
| | | x) Twigs and Links |

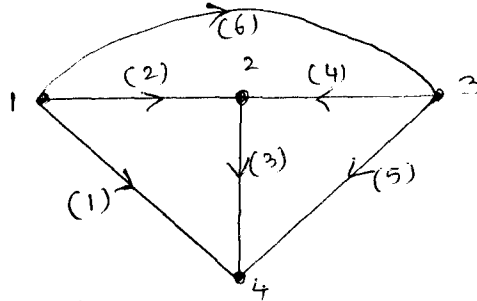
OR

- Q.2 a)** Draw the dual of the network shown in fig. (05)



P.T.O.

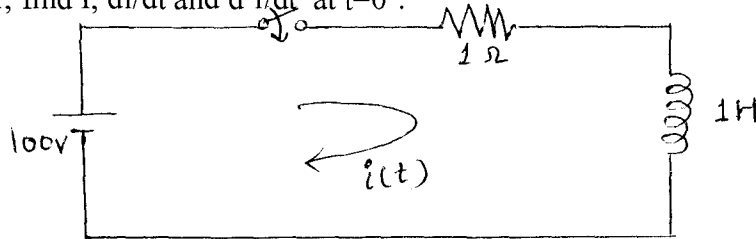
- b) Obtain tree and Tiesets from the given graph and write Tieset matrix. (05)



- Q.3 Why initial conditions needs to be defined while solving transient analysis circuits? Also write initial conditions for resistor, capacitor and inductor (10)

OR

- Q.3 In a given network of fig., the switch is closed at $t=0$ with zero current in the inductor, find I , di/dt and d^2i/dt^2 at $t=0^+$. (10)



- Q.4 a) Compare series and parallel resonant circuit. (05)
 b) A coil having an inductance of LH and a resistance of 12Ω is connected in parallel with a variable capacitor. At $\omega = 2.3 \times 10^6$ rads/s, resonance is achieved and at this instant, capacitance $C = 0.021 \mu F$. find the inductance of a coil. (05)

OR

- Q.4 Derive an expression for parallel Resonance circuit. What is dynamic impedance of a parallel circuit? (10)

- Q.5 Define following parameters with respect to: (10)
 i) Symmetrical Network: a) Characteristics Impedance
 b) Propagation Constant
 ii) Asymmetrical Network: a) Interative Impedance b) Image transfer Constant
 c) Image Impedance

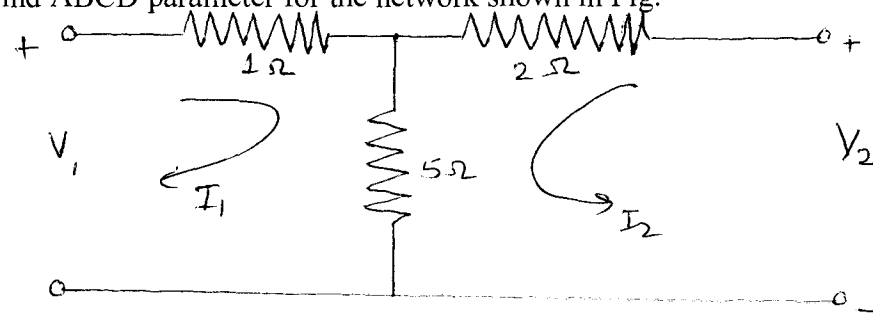
OR

- Q.5 Draw T- Network of constant K Low pass filter and explain following terms: (10)
 i) Nominal Impedance ii) Cut off frequency
 iii) Attenuation constant iv) Phase constant
 v) Characteristic Impedance

- Q.6 Explain interrelationship for Z-parameter in terms (10)
 i) Y- parameter ii) ABCD Parameter

OR

- Q.6 a) Derive and explain parallel connection for two port network. (05)
 b) Find ABCD parameter for the network shown in Fig. (05)



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