

SUBJECT: CIRCUIT THEORY

Day : Wednesday
Date : 15/05/2019

S-2019-2569

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

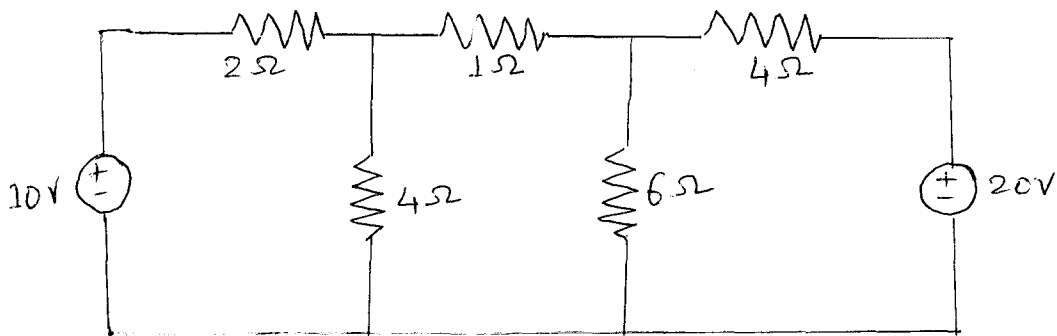
N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw the diagrams wherever necessary.
- 4) Assume suitable data, if necessary.

Q.1 Name the type of sources which supply energy to the networks. Define source transformation and source shifting with example of each. **(10)**

OR

Q.1 a) Calculate the current through 6Ω resistance of the given network by application of basic Kirchhoff's Laws. **(06)**

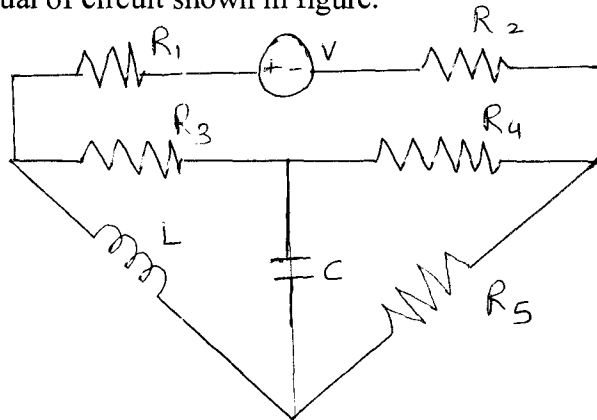


b) Explain Kirchhoff's Laws with example. **(04)**

Q.2 What are the network equilibrium equations used graph theory? Explain with circuit diagram. **(10)**

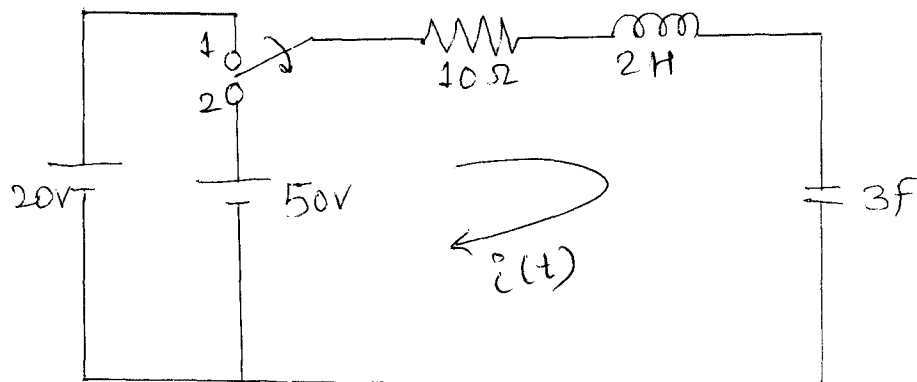
OR

Q.2 a) Draw the dual of circuit shown in figure. **(06)**



b) What are the steps involved in constructing the dual of a network? **(04)**

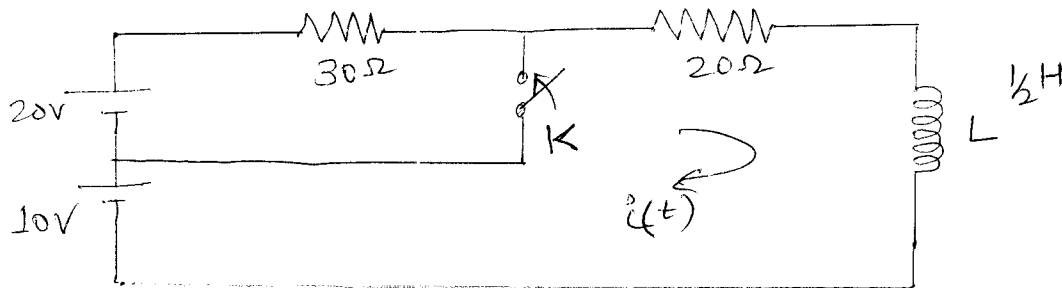
Q.3 In the circuit shown in figure; the switch is moved from position 1 to 2 at $t = 0$. The switch is in position 1 for long time. Determine the expression for current $i(t)$ **(10)**



P.T.O.

OR

- Q.3** In the network shown in fig. a steady state is reached when the switch K is open. At $t = 0$, the switch 'k' is closed. Find the current $i(t)$ for $t > 0$. (10)



- Q.4** Define the following parameters w.r.t. series resonance: (10)

- i) Power factor ii) Current iii) Voltage iv) Phasor diagram

OR

- Q.4** What is circuit magnification factor of series RLC circuit? Explain it in detail. (10)

- Q.5** Define the following terms w.r.t. low pass filters (10)

- i) Nominal Impedance ii) Cut-off frequency iii) Attenuation constant
iv) Phase constant v) Characteristics impedance

OR

- Q.5** a) What is band pass filter? Draw its T- network and π -network. Write the formula of L_1 , C_1 , & L_2 , C_2 . (05)

- b) How the disadvantages of constant - k filters are overcome in m-derived filters. (05)

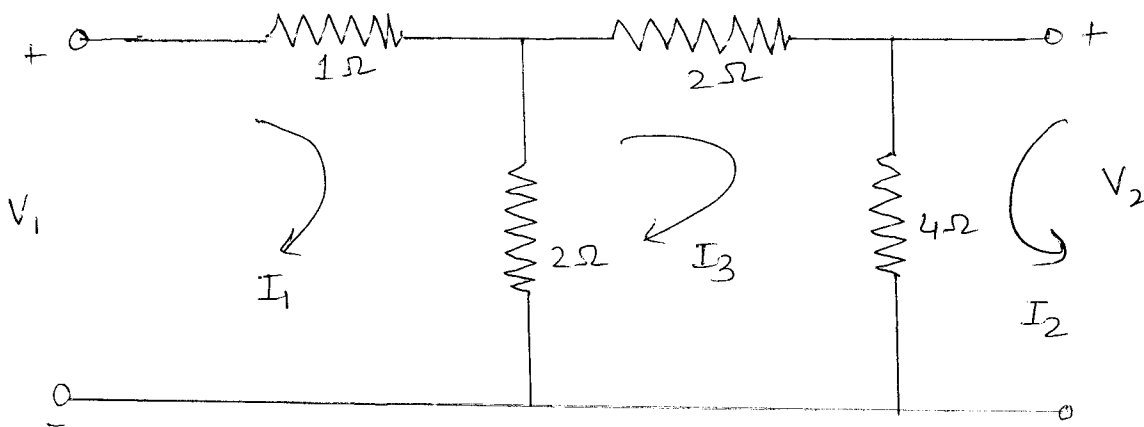
- Q.6** a) Explain parallel connections of two-port Network with suitable diagram (05)

- b) What are the conditions for reciprocity & symmetry for the following networks? (05)

- i) Z - parameter ii) Y - parameter
iii) ABCD-parameter iv) Hybrid-parameter

OR

- Q.6** Determine hybrid parameters for the networks shown in figure. Determine whether the Network is reciprocal or not. (10)



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