(37)

SE - Sem - III - CBGS - Electrical - EN

**QP Code : 30739**

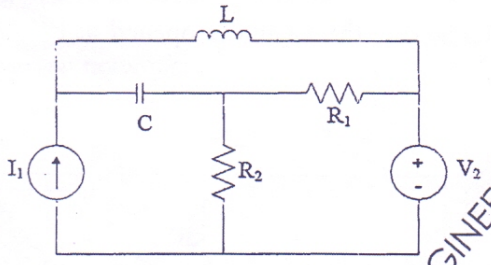
(3 Hours)

[Total marks: 80]

N.B:- (1) **Question 1 is compulsory**
(2) Solve any **three** questions from remaining **five** questions.
(3) Figures to the right indicate **full** marks.
(4) Assume suitable data if necessary.

Q1 Attempt the following 20

a) Draw the dual of following circuit.

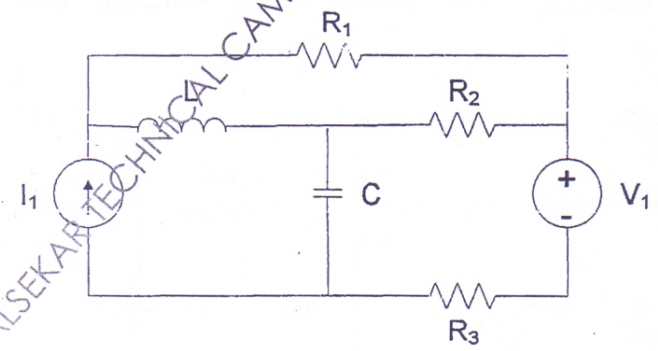



b) Find the condition of symmetry for Z- parameters.

c) Write the properties of positive real function.

d) State and explain Reciprocity theorem.

Q2 a) Write f-cutset, f-tieset and incidence matrix for the given network 10

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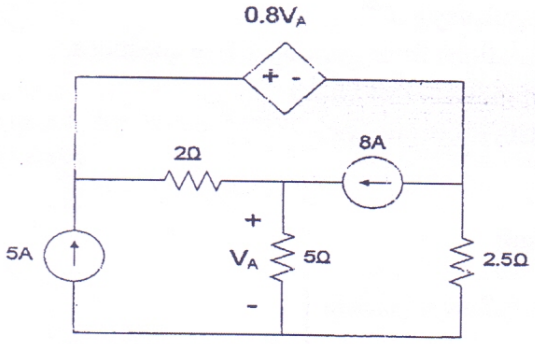
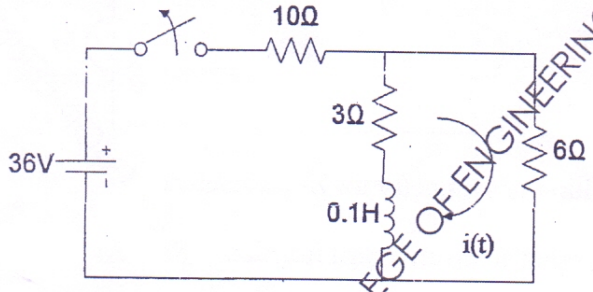
Q2 b) Use nodal analysis to find $V_A$ and the power dissipated in 2.5Ω resistor in given circuit. 10

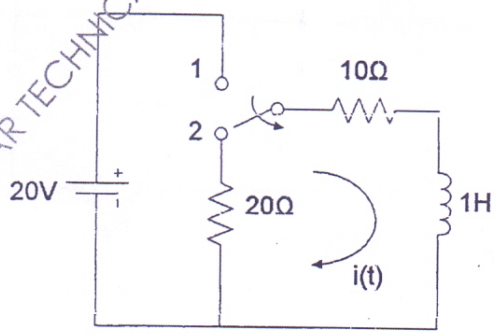



Q3a) In the network shown below, the switch is opened at t=0. Find i(t) using laplace transform. 06




Q3b) Explain Millman's Theorem. 04

Q3c) In the network shown in figure, the switch is changed from position 1 to 2 at t=0, steady state condition having reached before switching. Find the values of $i, \frac{di}{dt}, \frac{d^2i}{dt^2}$ at $t=0^+$. 10

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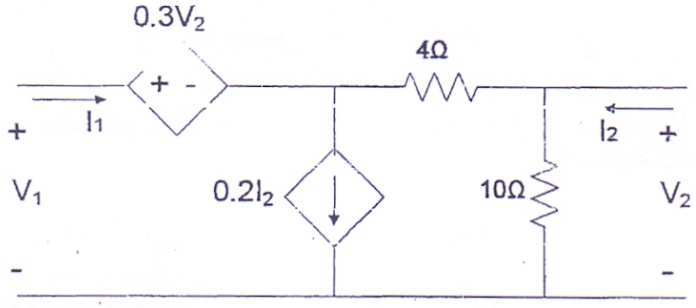
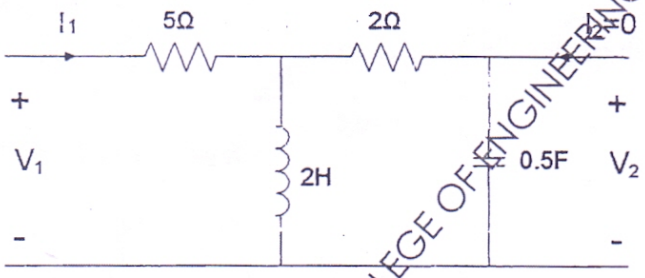
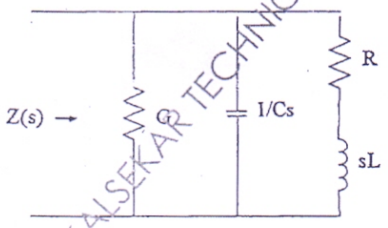
Q4 a) Find $h_{12}$, $Z_{12}$, $Y_{12}$ and $h_{22}$ for the given two port network. 10

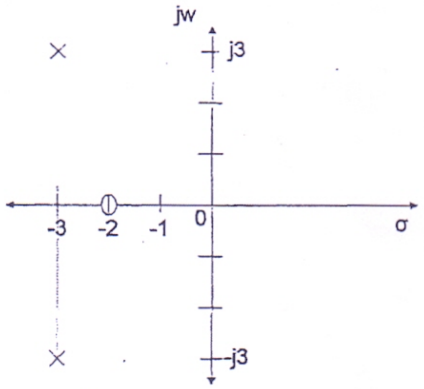



Q4 b) Determine the driving point impedance $\frac{V_1}{I_1}$, transfer impedance $\frac{V_2}{I_1}$ andvoltage transfer ratio $\frac{V_2}{V_1}$ in the given network. 10




Q5 a) A network and pole zero diagram for a driving point impedance Z(s) are shown in figures. Calculate the values of the parameters R, L, G and C if Z(j0)=1. 10

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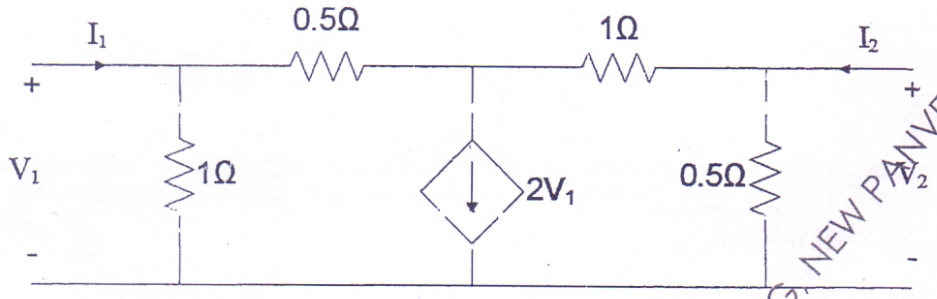
Q5 b) Realize Cauer I and Cauer II forms of following impedance function. 10

$$Z(s) = \frac{10s^4 + 12s^2 + 1}{2s^3 + 2s}$$

Q6 a) Determine Y parameters for given circuit. Express Z parameter in terms of Y parameter and find values. 10




Q6 b) Calculate mesh currents in given circuit 10