

Code: R5 100406

R5

B.Tech I Year (R05) Supplementary Examinations, May 2012

## **NETWORK ANALYSIS**

(Common to ECE, EIE, BME and ECC)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions

All questions carry equal marks

\*\*\*\*

- 1 (a) Define and explain (i) Resistance (ii) Inductance (iii) Graph (iv) Basic cut set matrix.
  - (b) For a given network draw the graph and choose a possible tree. Construct the basic tie set schedule. Write the equations for the branch currents and in terms of link currents and write separately the independent equations.



- 2 (a) Define co-efficient of coupling and derive the expression for co-efficient of coupling.
  - (b) Two coils A and B are connected in series the coils have self inductances L<sub>A</sub> and L<sub>B</sub> with a mutual inductance M. What is the effective inductance of the series circuit?
- <sup>3</sup> For the circuit shown the switch is closed at t=0, find the values of  $i_1$ ,  $i_2$ ,  $\frac{di_1}{dt}$ ,  $\frac{di_2}{dt}$ ,  $\frac{d^2i_1}{dt^2}$  and  $\frac{d^2i_2}{dt^2}$  at t = 0<sup>+</sup>.



Contd. in Page 2





## Code: R5 100406

<sup>4</sup> Find the response of the network shown when the input voltage is (i) unit impulse function  $\delta(t)$ . (ii)  $\vartheta_i(t) = e^{-2t}$ 



- 5 (a) State and explain maximum power transfer theorem.
  - (b) Draw the dual network for the given circuit and also write down the procedure to obtain dual network.  $A_{1}^{R_{1}}$



- 6 (a) Define and obtain hybrid parameters by taking any one example.
  - (b) Obtain short circuit parameters for the given network.



- 7 What is an alternator? Briefly explain the design of alternator.
- 8 (a) Write short notes on constant K high pass filters.
  - (b) Design a low pass filter to have a cutoff at 796 Hz when terminated in a 600 Ω resistance in the T configuration.

\*\*\*\*

**R5**