Registration No. : | | | | | | | | | | |

Total number of printed pages – 3

B. Tech

BEES 2211

Third Semester (Back/Special) Examination – 2013

NETWORK THEORY

BRANCH : AEIE, CSE, EC, EEE, EIE, ELECTRICAL, ETC, IEE, IT

QUESTION CODE : D224

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which are compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

(a) What is meant by linear and nonlinear elements ?

(b) Explain how voltage source with a source resistance can be converted into an equivalent current source.

(c) In three-phase circuit, what do you mean by balanced load ?

(d) Mention the Properties of a parallel RLC circuit.

(e) Represent graphically for the expression $y = u(a - t)$.

(f) Give the limitations of using superposition theorem.

(g) Why transients occur in electric circuits ?

(h) What is Routh-Hurwitz stability criterion ?

(i) What is cut set matrix ? Explain in brief.

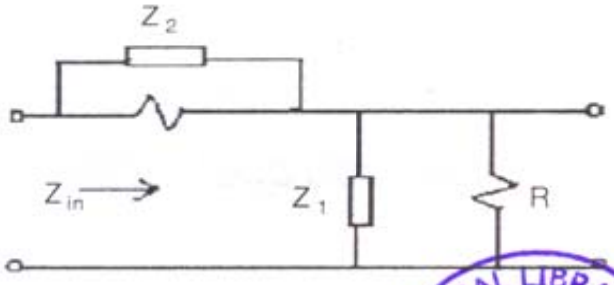
(j) Define Laplace transform. Find L.T.of $e^{-at}\sin(wt)$.

2. (a) Find the Z-parameter for the network. The network is a T– type network. Series branches are 5 kΩ and 3 kΩ. The shunt branch being 12 Ω. 5

P.T.O.

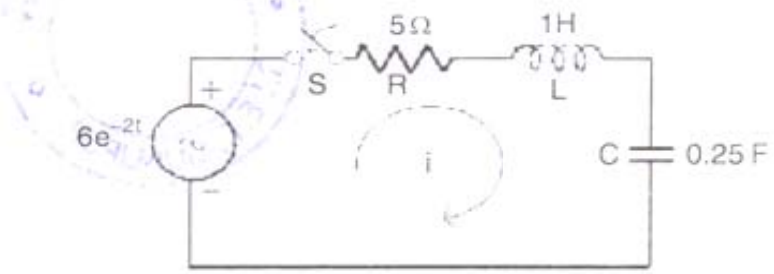
(b) Explain and derive the relationships for bandwidth and half power frequencies of RLC series circuit. 5

3. (a) Determine the conditions under which the input impedance of the network shown in figure will be equal to R. 5



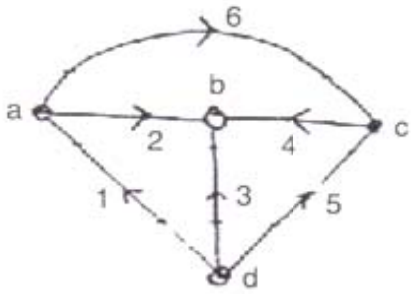
(b) Draw and explain the characteristics of ideal band-pass and band-stop filter. 5

4. In the circuit shown in figure, the switch is closed at time t=0. Obtain i(t). Assume zero current through inductor L and zero charge across C before closing the switch. 10

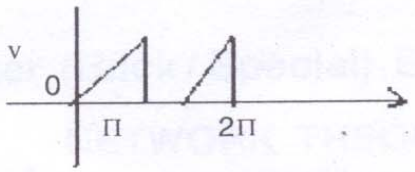


5. (a) A 2-port network has equations $V_1 = 4I_1 + I_2$ and $V_2 = 3I_1 + 3I_2$. Determine its ABCD parameters. 5

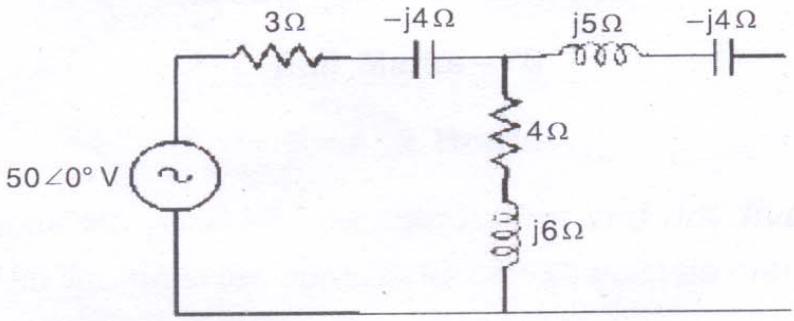
(b) For the graph shown in the figure, find the compete incidence matrix. 5



6. (a) Find the trigonometric Fourier series for the wave shown in figure and plot the spectrum. 5



(b) Determine the Thevenin's equivalent for the figure. 5



7. (a) What are ABCD parameters ? Prove that AD – BC = 1. 5

(b) Explain with example, odd symmetry and even symmetry of Periodic waveforms. 5

8. Write short notes on any two 5×2

(a) Network synthesis

(b) Laplace Transform

(c) Bandwidth and Q-factor

(d) Phase sequence.