24025

B.Tech. 3rd Semester AEIE F-Scheme Examination,

December–2014

NETWORK THEORY

Paper–EE–203–F

Time allowed : 3 hours] *[Maximum marks : 100*

*Note : Attempt **five** questions in total selecting **one** questions from each section. **Question No. 1 is compulsory.***

1. (i) Define signal ? Draw the waveform of $F(t) = [u(t) - u(t-1)]$

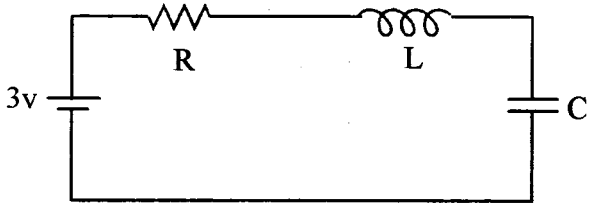
(ii) Explain the condition of Hurwitz.

(iii) What are the properties of RC driving point immittance ?

(iv) Derive the expression for synthesis of Y_{21} and Z_{21} with 1 ohm termination. 20

Section–A

2. (a) In series RLC ckt. Having data is R = 1/16 ohm, L = i/16 H, C = 4F determine V (0+) dV (0+)/dt and d^2V (0+)/dt^2 (14)



(b) Derive the expression for transient response in AC for RL series. (6)

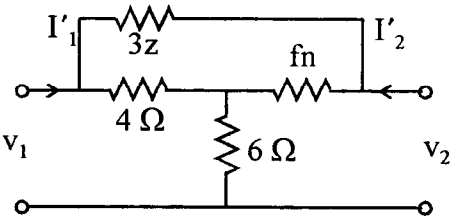
3. (a) Explain the concept of complex frequency. (10)

(b) Explain the initial value theorem. (10)

Section–B

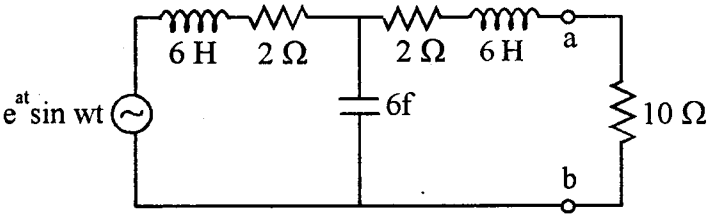
4. (a) The two port network A and B are connected in parallel if the input voltage is 2V and current is 2A, 3A gets the output as 10V, 5A, 1A, calculate the parameter. (10)

(b) Find the Y-parameter of the ckt. Given below.



(10)

5. (a) Apply Norton's theorem using Laplace transform for the ckt. Given below across a and b. (10)



(b) Explain the parallel-series connection of two port network. (10)

Section–C

6. (a) Check wether the given function are p.r.f or not

$$f(1) = (s^3 + 5s^2 + 9s + 3) / (s^3 + 4s^2 + 7s + 9)$$

(8)

(b) Check wether the given polynomial are Hurwitz or not.

$$P(s) = s^4 + s^3 + 2s^2 + 3s + 2$$

$$z(s) = \frac{(s^2 + 4s + 1)}{4s^2 + 5s + 1}$$ (12)

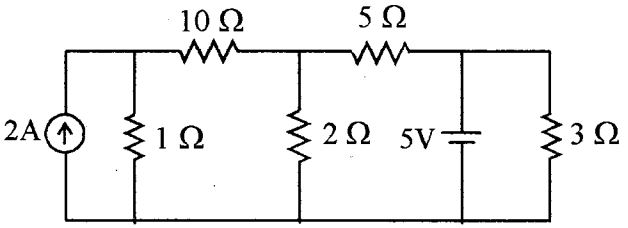
7. Realize

(i) Cauer – II

(ii) Foster – II (20)

Section–D

8. Draw the oriented graph of the network as shown in figure. Determine the fundamental loop cutset matrix.



(20)

9. Synthesise the Z_{21} and Y_{21} as shown in the polynomial given below :

$$Z'_{21} = \frac{1}{s^4 + 3s^3 + 2s^2 + 6s + 5}$$

$$Y'_{21} = \frac{1}{s^3 + 3s^2 + 2s + 6}$$ 20