Roll No. .....

24025

B. Tech 3rd Sem. (EEE) Examination – December , 2018

NETWORK THEORY

Paper : EE-203-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any ***five*** questions, ***one*** question from each Section. Question No. 1 is ***compulsory***.

1. Explain the following terms in network theory : $5 \times 4 = 20$

(i) Mesh analysis

(ii) KVL & KCL

(iii) Current division rule

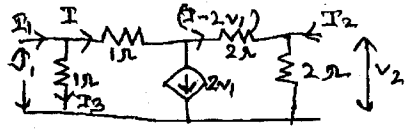
(iv) Laplace transform

(v) Transfer function

SECTION – A

2. (a) State and prove Theverin's theorem. 10

(b) Obtain Z parameter of the circuit shown : 10

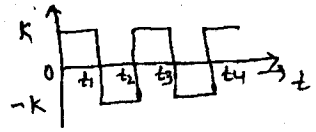


3. (a) Derive the condition for reciprocity & symmetry for ABCD parameter. 10

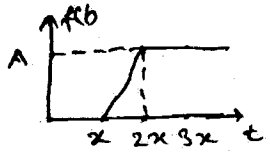
(b) Derive the relationship between Z & ABCD parameters. 10

SECTION – B

4. (a) What is the Laplace transform of waveform shown ? 10



(b) Synthesize the waveform : 10



5. (a) In a series LC circuit of 50 dc is applied at $t = 0$. Find the voltage across the capacitor at $t = \infty$. Assume zero initial condition in the circuit elements. 10

(b) Obtain the pole zero diagram of the given function and obtain the time domain response : 10

$$I(S) = \frac{2S}{(S+1)(S^2+2S+4)}$$

SECTION – C

6. (a) A function is given by : 10

$$Z(S) = \frac{S^3+5S^2+9S+3}{S^3+4S^2+7S+9}$$

Find the positive realness of the function.

(b) Test whether the following functions are Hurwitz or not : 10

$$S^4+3S^2+2$$

7. The driving point impedance of a network is given by : 20

$$Z(S) = \frac{8(S^2+1)(S^2+3)}{S(S^2+2)(S^2+4)}$$

Realise the network in Foster I, II.

SECTION – D

8. (a) Synthesize the following function using 1Ω termination $Z_{21}(S) = 1/S^3+3S^2+3S+2$. 10

(b) Explain tie-set, cut set in graph theory. 10

9. (a) Explain different properties of transfer function. 10

(b) Derive step & impulse response of a series RL circuit. 10