**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination - June 2011**

**Subject Title: NETWORK ANALYSIS AND SYNTHESIS Time: 3 hours**

**Subject Code: EE295 Maximum Marks: 100**

#### **Answer ALL questions**

**PART – A (10 x 1 = 10 MARKS)**

1. The inverse transform of 1/S is \_\_\_\_\_\_\_.

2. The driving point impedance is defined as the ratio of \_\_\_\_\_\_\_.

3. The function is said to be having simple poles and zeros only if \_\_\_\_\_\_\_are not repeated.

4. The time constant of a series R-L circuit is \_\_\_\_\_\_\_.

5. The number of branches in a tree is \_\_\_\_\_\_\_ than the number of branches in a graph.

6. The cut set schedule gives the relation between \_\_\_\_\_\_\_.

7. Hybrid parameters find extensive use in \_\_\_\_\_\_\_ circuits.

8. The attenuation of a wave filter can be expressed in \_\_\_\_\_\_\_.

9. The roots of the odd and even parts of a Hurwitz polynomial P(s) lie on the \_\_\_\_\_\_\_.

10. In the first Foster form, the presence of first element capacitor Co indicates pole at \_\_\_\_\_\_\_.

**PART – B (5 x 3 = 15 MARKS)**

11. Write the steps to obtain residues by pole-zero plots.

12. Compare time domain and frequency domain analysis.

13. Define (a) Tree (b) Links (c) Co-tree of the graph.

14. Discuss the classification of filters.

15. Write any three properties of Hurwitz polynomials.

**PART – C (5 x 15 = 75 MARKS)**

16. a. Describe the restrictions on location of poles and zeros in driving point functions. (8)

b. Verify whether the following expression for driving point impedance is suitable for representing a passive one port network. Z(s) =  . (7)

(OR)

17. Describe in detail the steps to derive time domain response from pole-zero plots.

18. Explain in detail about Amplitude and Phase Characteristics from pole zero plot with example.

(OR)

19. a. Discuss about sinusoidal response of R-L circuit. (8)

b. Explain about Complex Loci for a RC circuit in detail. (7)

20. a. For the given graph in figure, write the tie set schedule and obtain the relation between branch currents and link currents. (8)

a

b

c

d

1

2

3

b. Discuss about duality and construction of a dual network in detail. (7)

(OR)

[P.T.O]

21. a. For the given graph in figure, write the cut set schedule and obtain the relation between tree branch voltages and branch voltages. (8)

1

2

3

4

a

b

c

d

e

b. Describe the formulation of equilibrium equation based on loop. (7)

22. a. Find the Z parameters for the circuit shown in Figure. (8)

a1

a2

b1

b2

v1

v2

I1

I2

1Ω

2Ω

2Ω

4Ω

b. The impedance parameters of a two port network are Z11= 6Ω; Z22= 4Ω; Z12= Z21= 3Ω. Compute the Y parameters. (7)

(OR)

23. a. Derive equations for ZOT, ZOC, ZSC and propagation constant of a T-Network filter. (8)

b. Design a m-derived high pass filter with a cut off frequency of 10 kHz; design impedance of 500Ω and m = 0.4 (7)

24. a. Check whether the given polynomial is Hurwitz or not.

P(s) = 2s5 + 3s4 + 6s3 + 5s2 + 3s + 4 (8)

b. Find the first foster form of the driving point function of Z(s) = . (7)

(OR)

25. a. Check whether the function F(s) = is positive real function or not. (8)

b. Find the first Cauer form of the function Z(S) = (7)