Hall Ticket Number:

Code No. : 22314

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (E.C.E.) II Year II-Semester Main & Backlog Examinations, May-2017

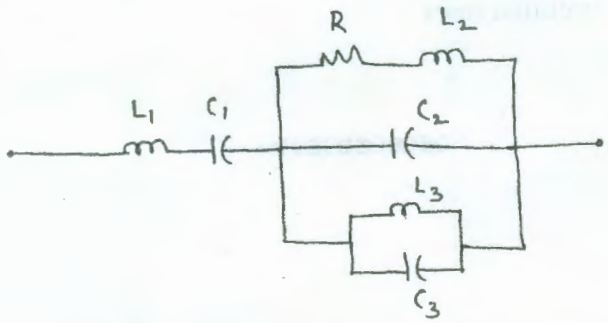
Networks and Transmission Lines

Time: 3 hours Max. Marks: 70

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. List out the functional classifications of networks.
2. The impedance of a series and shunt arms of L network are j300 ohms and –j700 ohms respectively. Calculate iterative impedances of the network.
3. What are the advantages of 'm' derived filters?
4. Determine the circuit elements of a prototype high pass T section filter having cut off frequency of 1000 Hz to work into a 600 ohm load resistance.
5. List out the classifications of attenuators.
6. For a given network, draw its inverse network.



7. Define primary constants and secondary constants of a transmission line.
8. Write the properties of transmission lines.
9. What are the drawbacks of Quarter wave transmission line impedance matching technique?
10. Distinguish between open and short circuit stubs.

Part-B (5 × 10 = 50 Marks)

11. a) Explain the electrical characteristics of a symmetrical network. [5]

    b) Derive characteristic impedance and propagation constant expressions for symmetrical π network. [5]

12. a) Explain constant-K bandpass filter and derive its design equations. [5]

    b) Design an m derived T section low pass filter having cut off frequency fc = 1000 Hz, design impedance R_k = 600 ohms and frequency of infinite attenuation f∞ = 1050 Hz. [5]

13. a) Synthesize the given driving point impedance function $Z_{RL}(s) = \frac{2(S+1)(S+3)}{(S+2)(S+6)}$ in Foster form I and II realizations. [5]

    b) Write the properties of Positive real function and Test whether the given function $F(s) = \frac{S+5}{S^3+3S^2+2S+1}$ is PRF or not. [5]

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14. a) Prove that for a transmission line $Z_o = \sqrt{Z_{SC} Z_{OC}}$. [6]

    b) Explain about loading of cables. [4]

15. A lossless transmission line whose characteristic impedance is 150 Ω and which is terminated by 150+j300Ω load. Using Smith Chart determine [10]

    a) Reflection Coefficient at distance of 0.3 λ from the load

    b) VSWR, R_{max} *and* R_{min} on the transmission line

    c) Impedance at a distance of 0.8 λ from the load

    d) Convert load impedance into admittance.

16. a) Design symmetrical lattice network for the following specifications Characteristic impedance $Z_0 = 600\Omega$ and propagation constant $\gamma = j\frac{\pi}{8}$ [5]

    b) Explain about composite filter with a neat block diagram. [5]

17. Write short notes on any ***two*** of the following:

    a) Hurwitz polynomials [5]

    b) Open and short circuited lines [5]

    c) Stub matching. [5]