Hall Ticket Number:

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VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. II Year (E.C.E.) II-Semester (Supplementary) Examinations, December-2016

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. Distinguish between Symmetrical and Asymmetrical networks.
2. Define image impedance and iterative impedance.
3. Design a constant k-type LPF for cut off frequency of 1 KHz with nominal impedance 600Ω.
4. Draw a general block diagram for Composite filter.
5. Design a symmetrical T- attenuator for Ro = 600 Ohms and attenuation of 20 dB.
6. Test whether the given polynomial $S^4 + 5S^3 + 8S^2 + 9S + 6$, is Hurwitz or not.
7. Define the primary constants of a transmission line.
8. Determine the VSWR of a transmission line when load is short circuit and under matched condition.
9. What are the differences between single and double stub matching?
10. How is VSWR related to Reflection Co-efficient?

Part-B (5 × 10 = 50 Marks)

11. a) Derive expressions for image and iterative impedances of a symmetrical T-network. [5]
    b) An impedance matching network is to operate between resistances 100 Ω and 500 Ω. having a image phase constant of 63.4^0. Compute the insertion loss and insertion ratio of the network. [5]
12. a) Find the circuit elements of a prototype high pass T-section filter having cut-off frequency of 1,000 Hz to work into a 600 Ohms load resistance. [6]
    b) What are the limitations of constant K filters? How to overcome by using m - derived sections? [4]
13. a) Design an asymmetrical L-attenuator to work into design impedance of 400 Ω and 300 Ω. [5]
    b) Derive an expression for input impedance of a line of finite length. [5]
14. a) Derive the condition for a distortion less transmission line and explain how loading of cables helps to achieve this condition. [6]
    b) Impedance measurements made on a ¼ Km length of a cable at 1.6 KHz under open and short circuit conditions have Zoc = $2460\angle -86.5^0$, Zsc = $21.5\angle 11^0$. Calculate Zo, α (alternnation constant) and β (Phase constant). [4]
15. a) A lossless transmission line whose characteristic impedance is 50 Ω and which is terminated by the load 100 + j150 Ω. Determine length of the short circuit stub to match the load using Smith chart. [6]
    b) Write applications of Smith Chart. [4]
16. a) Derive the expression for the characteristic impedance and propagation constant for asymmetrical π-network. [6]
    b) List out the merits and demerits of m-derived filters. [4]
17. Write short notes on any **two** of the following:
    a) Equalizers [5]
    b) Phase velocity and Group Velocity. [5]
    c) Properties of transmission lines at UHF. [5]

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