Roll No .....

EC - 505

B.E. V Semester

Examination, December 2013

Communication Networks And Transmission Lines

Time : Three Hours

Maximum Marks : 70

Note: 1. Attempt one question from each unit.
2. Each question carry equal marks.

Unit - I

1. a) What are lattice and bridge T-network? Explain a symmetrical bridge T-network. Write different steps involved in reduction of complex network to T-section.

   b) Calculate the iterative and image impedance of a T-network with series and shunt arm impedance z_1 and z_2 (series) and z_3 (shunt), $z_1 = 30 + j7.5$, $z_2 = 50 + j10$ and $z_3 = -j3.229$.

OR

2. a) Distinguish between symmetrical and asymmetrical attenuator.

   b) Draw the circuit of a symmetrical T-attenuator. Derive design equation giving the series and shunt arm resistor in terms of

      i) Characteristic impedance R_O

      ii) The current ratio $N = I_S/I_R$.

Unit - II

3. a) Explain the designing of constant -k high pass filter.
   b) Explain M-derived band pass filter. Obtain the expression for $f\infty$ at infinite attenuation and constant M.

OR

4. a) Design a chebyshev filter.
   b) What is a low-pass constant -k filter? Draw the characteristics curves for a constant k low pass filter.

Unit - III

5. a) Discuss insertion loss synthesis co-efficient matching technique.
   b) Explain Bott-Duffin method.

OR

6. a) Find the Foster's first form the driving point impedance function

$$Z(s)=\frac{8(s^2+1)(s^2+9)}{s(s^2+4)}$$

   b) Explain Strum's theorem test.

Unit - IV

7. a) A generator of 1volt, 100Hz supplies power to 1000km long open wire line terminated in z_0 and having following parameters.

$R=10.4\Omega, L=0.0037\,H, G=0.8\mu\mho, C=0.00835mF.$

Calculate the phase velocity, characteristic impedance, propagation constant and power delivered at the receiving end.

   b) Define reflection coefficient and find out the expression for the same.

OR

8. a) Discuss how measurement of the input impedance can be used to locate a fault in a cable?
   b) Explain the working of a constant resistance equalizer with the aid of diagram.

Unit - V

9. What do you mean by SWR? A low loss line with $z_0=70\Omega$ is terminated in an impedance $z_R=115-j80\Omega$. The wavelength of the transmission is 2.5m using the given smith chart find the following:
   a) Standing wave ratio
   b) Maximum and minimum line impedance.
   c) Distance between the load and first voltage maxima.

OR

10. Write short notes on :
    a) Smith Chart
    b) Quarter wave transfer.

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