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Roll No

EC - 505**B.E. V Semester**

Examination, December 2013

Communication Networks And Transmission Lines*Time : Three Hours**Maximum Marks : 70*

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- 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_0
 - ii) The current ratio $N = I_S/I_R$.

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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_{∞} 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 1 volt, 100Hz supplies power to 1000km long open wire line terminated in z_0 and having following parameters.

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

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

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- 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.
