

**FACULTY OF ENGINEERING**

**B.E. 2/4 (ECE) II – Semester (Main) Examination, May/ June 2017**

**Sub: Networks and Transmission Lines**

**Time: 3 Hours**

**Max.Marks: 75**

**Note: Answer all questions from Part – A and any five questions from Part – B.**

**PART – A (25 Marks)**

- 1 Define iterative and Image impedances of a asymmetrical network. (2)
- 2 What are passive four terminal networks? Give the properties of the network. (3)
- 3 What are the limitations of constant  $-k$  filters. How are the limitations overcome? (3)
- 4 Draw and bring out the characteristic of Notch filter. (2)
- 5 What are the properties of Positive Real Function? (3)
- 6 What are Inverse networks? Give example. (2)
- 7 What type of distortions exist in transmission lines. (3)
- 8 Write on important specifications of telephone cable. (2)
- 9 Why is a one fourth wavelength TL act as a impedance inverter. (3)
- 10 Define phase and group velocity. (2)

**PART – B (5x10 = 50 marks)**

- 11 a) Differentiate symmetrical and asymmetrical networks and explain the propagation and impedance parameters. (5)  
b) Find the Open and Short circuit impedances of a T network. Prove the product of  $Z_{oc}$  and  $Z_{sc}$  is equal to  $Z_0^2$ . (5)
- 12 a) Derive the relation for conversion of T- $\pi$  network (4)  
b) Given  $Z_{oc} = 800$  ohms and  $Z_{sc} = 600$  ohms for a T network, find the parameters  $R_1$  and  $R_2$  Draw the circuit. (6)
- 13 a) What is the optimum value of 'm' in m-derived filters. How is the value decided (4)  
b) Design a low pass composite filter with  $f_c = 2000$  hz,  $f_a = 2050$  hz and  $R_k = 500$  ohms (6)
- 14 a) List the electrical characteristics of attenuators. Explain the difference between Decibel and Neper. (5)  
b) Why are matching networks required? Draw and Explain the design criterion of 'L' matching network. (5)
- 15 a) What are Primary and Secondary parameters of a Transmission line. Obtain attenuation and phase constants in terms of Primary and Secondary parameters. (5)  
b) Derive the condition for distortion -less transmission line. (5)
- 16 a) Briefly explain the characteristics of  $1/8$  and  $1/2$  wavelength Transmission lines. (4)  
b) For a low loss line with  $Z_0 = 70$  ohms,  $Z_r = 115 - j80$ . Find the following: (6)  
i) Standing wave ratio  
ii) Maximum and minimum Line impedance.
- 17 Write notes on the following: (10)  
a) Campbell formula  
b) Single and Double stub matching

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