Code No. : **6123**

FACULTY OF ENGINEERING
B.E. 2/4 (ECE) II Sem. (Main) Examination, June 2010
NETWORKS AND TRANSMISSION LINES

Time: 3 Hours] [Max. Marks : 75

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

PART – A **(25 Marks)**

1. State and explain reciprocity theorem. **3**

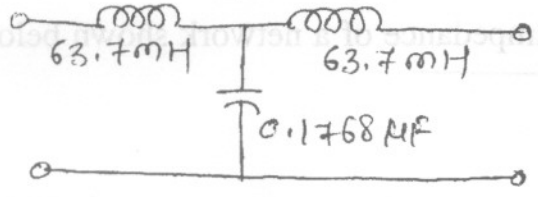
2. Express Y- Parameters in Z-parameters. **2**

3. Design a symmetrical T attenuator with $R_0 = 600\ \Omega$ and attenuation of 10 db. **3**

4. Define image parameters of a two port network. What is insertion loss ? **3**

5. List the advantages of m-derived filters. **2**

6. Find the cutoff frequency of the filter shown below : **2**



7. What is reflection co-efficient and VSWR for
   a) Open Circuit
   b) Short Circuit Lines ? **2**

8. What is the condition for a line to be distortion-less ? Define various types of distortions. **3**

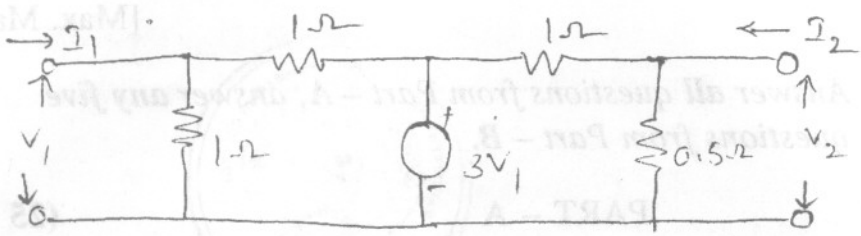
9. Define primary and secondary constants of a transmission lines. **3**

10. List the applications of Smith Chart. **2**

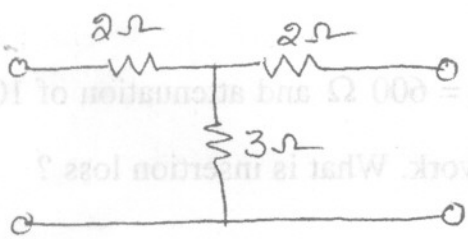
Code No. : 6123

PART – B (50 Marks)

11. a) Find the Z-parameters of resistive network shown below : 7

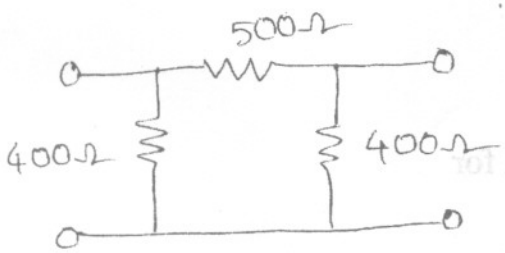


b) Find π-network for T network shown below : 3



12. a) Explain about Image impedances and Image Transfer constant for a two port Network. 5

b) Find the attenuation and characteristic impedance of a network shown below. 5



13. a) Design a composite T- section low-pass filter with f_c = 3.3 KHz, Z_0 = 600 Ω and f_∞ = 3.6 KHz. 7

b) What are the limitations of constant K-filters ? How are they avoided by using m-derived filters ? 3

14. Derive the formula of input impedance of a transmission line in terms of Z_0, I, γ and Z_R. Where these parameters have useful meaning, what are the applications of quarter waveline ? **10**

15. a) A transmission line of characteristic impedance of 100 Ω is terminated in a load $Z_L = (200 + j100)\ \Omega$. Design a single stub to match the line to the load using Smith chart. **6**

    b) Compare single stub matching with double stub matching. **4**

16. Derive the transmission line equations. State the condition for distortionless transmission line and verify its significance. **10**

17. a) Design L type matching section to match 400 Ω to 100 Ω impedance. **4**

    b) Give the units of all h-parameters. **3**

    c) Derive the relation between reflection coefficient and VSWR. **3**
