Code No. 2059

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II-Semester **(Main)** Examination, May 2013

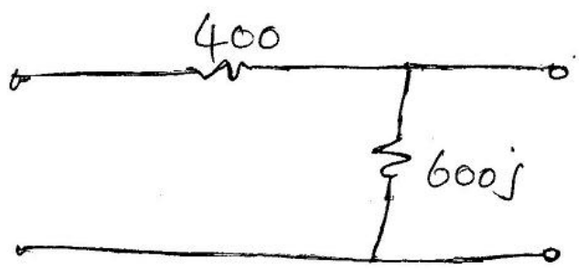
Subject : **Networks and Transmission Lines**

Time : 3 Hours Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

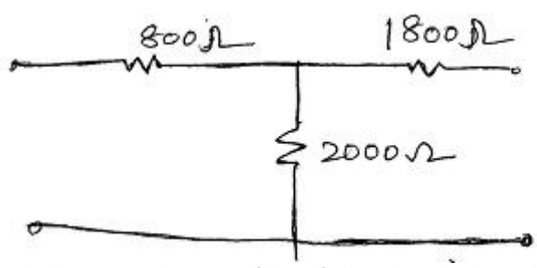
1. Draw the attenuation characteristics of a Band pass filters.
2. Define Insertion loss, insertion ratio of a network.
3. Define reflection coefficient, reflection loss of a Network.
4. Derive the relation between Neper and decibel.
5. Find the iterative impedances of the following Network



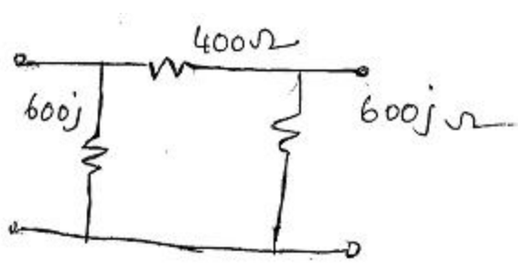
6. Define propagation constant and characteristic impedance of a Network.
7. Derive the condition for a filter to lie in pass band.
8. Design a symmetrical 'T' attenuator with an attenuator of 40 db and R_o=600Ω .
9. Define Skin depth
10. Design a constant 'K' high pass filter with a cut-off frequency 3KHZ and a nominal impedance of 600Ω.

PART – B (5x10=50 Marks)

11.(a) Find the iterative impedance of the following Network. Derive the formulae you use.



(b) Find the characteristic impedance of the following Network.



12. Design a composite low pass filters with a cutoff frequency 2KHZ and a nominal impedance of 600Ω with frequency of infinite attenuation is 2.1 KHZ.

13.(a) Find the second caver Network of the given function

$$z(s) = \frac{s^4 + 6s^3 + 4}{s^3 + 2s}$$

(b) Design a symmetrical 'T' attenuator with an attenuation of 60db and a terminating impedance of 600Ω.

14.(a) A 12 km line terminated by its characteristic impedance. At certain frequency the voltage at 1 km from the sending end is 10% below that at the sending end. Find the voltage across the load impedance in terms of percentage of sending end voltage.

(b) A transmission line 50 km long, gave the results of impedance measurement at 796 HZ

$Z_{oc}=328 \angle -29.2^{o}$ $Z_{sc}=1548 \angle 6.8^{o}$

Determine the line constants.

15. Design a m-derived High pass filter with a cutoff frequency of 5KHZ and a nominal impedance of 600Ω and frequency of infinite attenuation is 5.5KHZ. Derive the formulae you use.

16.(a) A Transmission line of 10 km long is terminated properly at the far end. At a frequency of 1000 HZ, the attenuation and phase constants of the line are .03 ne per/km .03 radius / km respectively. If the far end voltage at 1000 HZ is $4 \angle 0$ Calculate the sending end voltage of line.

(b) Derive the input impedance of a lossless transmission line.

17. Explain any three of the following:

(a) Single stub matching

(b) Quarter wave transformer

(c) Experimental determination of secondary constants of a transmission line

(d) Voltage and current distribution of a infinite Transmission line at a point 'X-km' from source.

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