Code No. 6059 / M

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II – Semester (Main) Examination, June 2014

Subject: Networks and Transmission Lines

Time: 3 Hours **Max.Marks: 75**

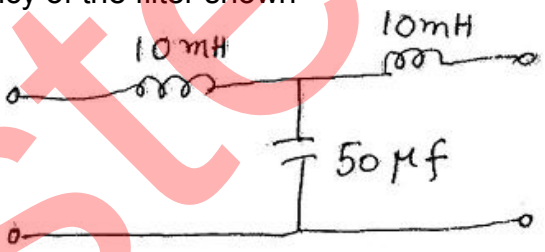
Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A

1 Find the characteristic impedance of the network shown below: (3)

2 Define image transfer constant and iterating transfer constant of a Network. (2)

3 Find the cutoff frequency of the filter shown (2)



4 What are advantages of 'm' – derived filter over constant K filter? (2)

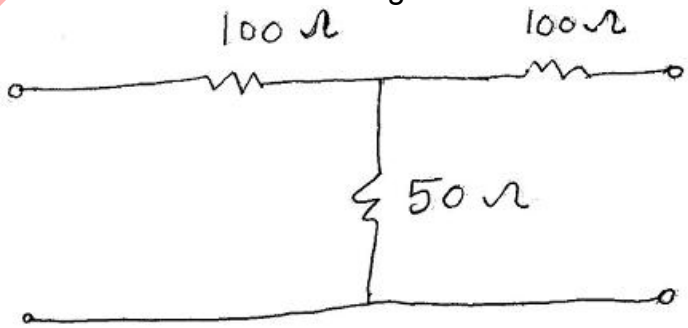
5 Derive the relation between nepers and decibels. (3)

6 Test whether the polynomial $P(S) = S^3+4S^2+5S+2$ is Hurwitz. (3)

7 Mention any two important functions of an equalizer. (2)

8 Show that 1/4 transformer acts like a impedance inverter. (3)

9 Find the attenuation in dB due to the following network. (3)

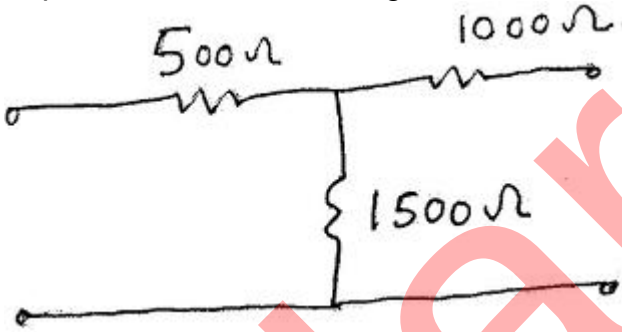


10 What are the applications of Smith chart? (3)

…2.

PART – B

11 (a) Find the image impedances of the following network. (5)



(b) Derive the expression for characteristic impedance of a symmetrical lattice network. (5)

12 (a) Design a composite High pass filter with a cut-off frequency of 15 KHz and a nominal impedance of 600Ω with frequency of infinite attenuation is 14 KHz. (6)

(b) Justify that m=0.6 for m-derived terminating half section. (4)

13 (a) the driving point impedance of a LC Network is given by $Z(S) = S^4+4S^2+3/S^3+2S$. Determine the second caver form of the network.

(b) Design a symmetrical T attenuator with an attenuation of 60 dB and a nominal impedance of 600Ω.

14 (a) A 12 Km line is terminated by its characteristic impedance. At a certain frequency the voltage at 1 Km from the sending end is 10% below that of input. Calculate VSWR.

(b) A transmission line 50 Km long gave the following results of impedances at 700 Hz, $Z_{OC} = 328 \angle -29.2^\circ$ and $Z_{SC} = 1543 \angle 6.3^\circ$ determining the line constants.

15 (a) Define reflection coefficient, VSWR. Derive the equation for input impedance of a loss-less transmission line.

(b) Explain briefly stub matching.

16 (a) A certain line has a characteristic impedance 600Ω determining the standing wave ratio when $Z_R = 650 – j\ 475$ ohms.

(b) What are applications of Smith chart? Explain.

17 (a) The VSWR measured on UHF transmission line working at a frequency of 300 MHz is found to be 'z' if the distance between load and voltage minimum is 8 metre. Calculate the value of load impedance.

(b) Explain with neat circuit diagram, how to measure the primary constants of a transmission line experimentally.

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