Code No. 11384

FACULTY OF ENGINEERING

B.E (ECE) II-Semester (CBCS) (Suppl.) Examination, November / December 2018

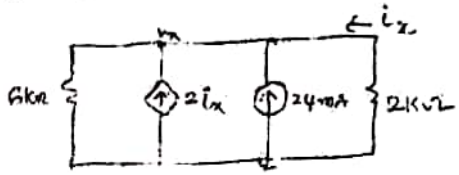
Subject : Basic Circuit analysis

Time : 3 Hours **Max Marks : 70**

Note: Answer all questions of Part – A & Any five questions from Part – B.

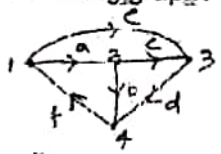
Part – A (20 Marks)

1 Find V_x and I_x is the following Circuit?



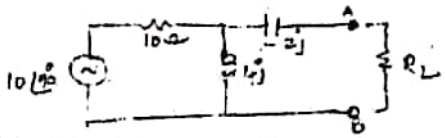
2 Find the voltage between AB Terminals V_{AB} in the following circuit?

3 Find the incidence matrix of the following graph?

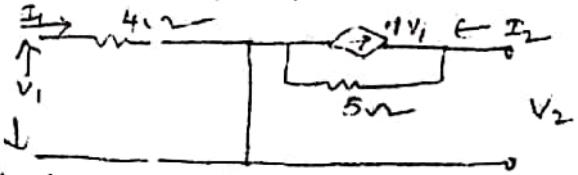


4 Explain briefly about power triangle?

5 In the following circuit find the condition for maximum power transfer when the load is resistive

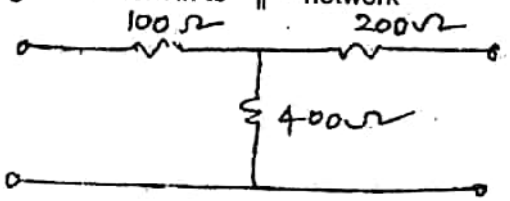


6 Find 'h' Parameters of the following Two port network?



7 Derive the condition for symmetry in terms of 'Z' parameters?

8 Convert the following 'T' Network in to π - network



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4/12/19

Code No: 2533/CBCS

FACULTY OF ENGINEERING

B.E.(ECE) III-Semester (CBCS)(Backlog) Examination, December 2019

Subject: Network Analysis & Synthesis

TIME: 3 Hours **Max. Marks : 70**

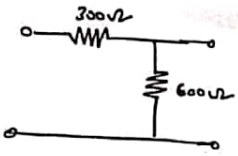
Note : Answer all questions from Part - A & any five questions from Part - B

PART - A (10 X 2 = 20 Marks)

1. Define the parameters of Symmetrical Network.
2. Explain the concept of Image impedance of a two port network.
3. Justify that m=0.6 for m-derived terminating half sections.
4. Design a Constant - k Low Pass T filter having a cut-off frequency of 4KHz and nominal characteristic impedance of 500Ω.
5. What are the applications of Equalizers.
6. Design a Lattice attenuator, if $Z_0 = 200\Omega$ and attenuation is 20 dB.
7. Obtain the pole zero plot of) $= \frac{s^2+4}{(s+2)(s^2+9)}$
8. What are the four possible ways of defining a Transfer Functions.
9. Mention any four properties of Hurwitz polynomial.
10. Explain the concept of removing a pole at infinity.

PART - B (5 X 10 = 50 Marks)

11.a) For a given L section find image and iterative impedances



b) Derive the expression for characteristic impedance of a symmetrical - π network in terms of open and short circuit impedances.

12. a) Derive the conditions of Pass and Stop bands for a filter.
    b) Design m-derived T - type LPF to work into load of 500Ω and cut-off frequency of 4KHz and peak attenuation at 4.5KHz.

13. Design a Composite High Pass Filter to operate into a load of 600Ω and having a cut-off frequency of 1.2KHz. the filter is to have one constant - k section with f_∞ = 1.1KHz and suitable termination half section.

14. a) An Attenuator is composed of Symmetrical T-section having a series arm of 175Ω and a shunt arm of 350Ω. Find the characteristic impedance and attenuation.
    b) Derive the necessary conditions for a bridge - T - equalizer with a neat circuit diagram.

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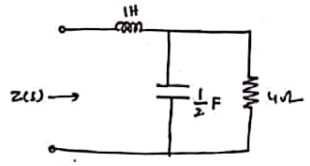
15. a) What are the restrictions on pole and zero locations for driving point functions And Transfer functions.
    b) Determine poles and zeros of the impedance function Z(S) in the network.



16. a) Obtain the Foster I form and Cauer I form of the RL impedance functions.

$$Z(S) = \frac{S(S+4)(S+8)}{(S+1)(S+6)}$$

b) Realize the network having impedance function.

$$Z(S) = \frac{6S^3+5.5S^2+6S+4}{2S^2+2S}$$

17. Answer any two of the following :
    a) Write the properties of LC and RC driving point Immitance functions.
    b) Explain about Asymmetrical L-Type attenuator.
    c) Derive an expression for the impulse response of an series RL circuit.

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Code No. 3022

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (New) (Main) Examination, December 2016

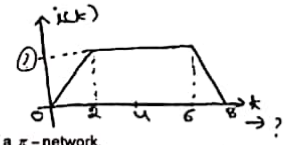
Subject: Basic Circuit Analysis

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

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

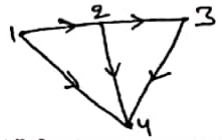
PART – A (25 Marks)

1 A current waveform is applied to a 2H inductor. Draw voltage waveform for the given figure. 5

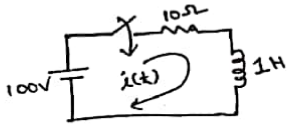


2 Find Y-parameters of a π – network. 5

3 The given figure shows a graph of the network. Show all the trees of this graph. 4



4 In the given network switch is closed at t=0 with zero initial current in the inductor, find $i(t) = \frac{di(t)}{dt}$ at $t=0^+$. 3



5 A series circuit consumes 2000 W at 0.5 leading power factor, when connected to 230 V, 50 Hz a.c supply. Calculate: 4
a) Current
b) Apparent power
c) Reactive power

6 A series RLC circuit has the following parameter values R=10Ω, L=0.01H, C=100 μF. Compute resonant frequency, bandwidth, lower and upper frequency of the bandwidth. 4

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Code No. 3022

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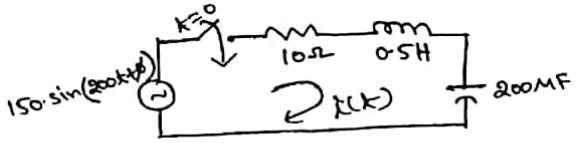
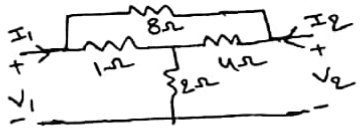
10 For the given network a sinusoidal voltage V = 150 sin(200t + ϕ) is applied at $\phi = 30^\circ$ determine current i(t). 1(



11 Find the equivalent T-network for the network shown below, 10



12 A coil having a resistance of 20Ω and inductance of 200μH is connected in parallel with a variable capacitor. This parallel combination is connected in series with a resistance of 8000Ω. A voltage of 230 V, 10^6 Hz is applied across the circuit find 10
a) The value of capacitance at resonance
b) Q factor of the circuit
c) Dynamic impedance of the circuit
d) Total circuit current.

13 Explain the following:
a) Kirchhoff's laws 3
b) Magnetically coupled circuits 3
c) Impedance and admittance functions 4

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Code No. 2251

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I-Semester (Main) Examination, November / December 2012

Subject : Basics Circuits Analysis

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. State and explain Thevenin's theorem. (3)
2. Define the principle of Duality. (2)
3. Convert the figure shown in (a) into a single voltage source in series with a resistance. (3)

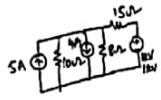

Fig. A

4. Define zero input response and zero state response. (2)
5. Give examples for first order and second order circuits.
6. Define the relation between self inductance L, mutual inductance m and coefficient of coupling. (3)
7. Draw and explain power Triangle for inductive load. (2)
8. Define reciprocity theorem and explain. (3)
9. Draw the equivalent network of h-parameters. (2)
10. What are the properties of parallel resonance circuit? (3)

PART – B (5x10=50 Marks)

11.(a) Evaluate mesh currents in the circuits shown in figure (b) (7)

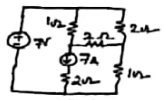

Fig. B

(b) Compute power absorbed by each element in ckt show in figure (c) (3)

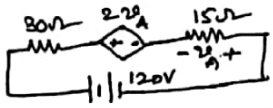

Figure C

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Code No. 2251

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12. Find the current ic (t) for t>0 in the circuit shown in figure (D). Assume steady state conditions before opening the switch at t=0. (10)

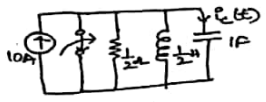

Figure D

13. In a series circuit of figure shown in (E), obtain the equation for voltage across the circuit. Find RMS value of the current and voltage across the circuit and average power delivered to the circuit. (10)
i(t) = 5+10 sin(1000t+45°)+100 sin (3000t+60°). v(t) = ?

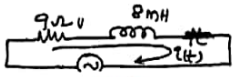

Figure E

14.(a) Prove that when networks are connected in cascade, the overall ABCD parameters are the matrix multiplication of individual ABCD parameters. (7)
(b) Define inverse h-parameters and draw the equivalent ckt. (3)

15.(a) What are the necessary conditions for driving point functions? (5)
(b) The Laplace transform of current I(s) in a network is given by
$I(s)\ \frac{3s}{(s+2)(s+3)}$ plot the poles and zeros in the s-plane and obtain the time domain response. (5)

16. For the network shown in figure (F), obtain the tie-set matrix and the network equilibrium equations using KVL. Calculate the loop currents and branch voltage. (10)

17. Write short notes on : (10)
(a) Magnetically coupled circuits
(b) Powers in a.c. circuit
(c) Transient and steady state response of a circuit.

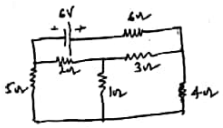

Figure F

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6/12/19

Code No.2904/AICTE

FACULTY OF ENGINEERING

ECE B.E. III Semester (Main)(AICTE) Examination, December 2019

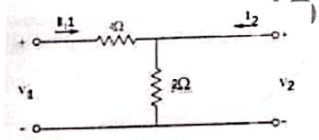
Subject: Network Theory

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A & any five questions from Part-B

PART – A (10 x 2 = 20 Marks)

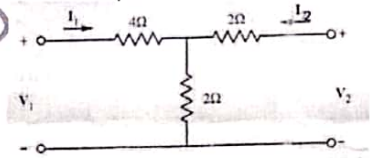
1 State Reciprocity Theorem.
2 Explain the reason for using Z-parameters for series-series interconnection of two port networks.
3 Define image and iterative impedance.
4 Find Iterative impedance of the network.



5 What are the advantages of a composite filter?
6 What is the criterion in choosing 'm' value in m-derived filter?
7 Design a symmetrical lattice attenuator with a Ro = 600Ω and attenuation of 60-dB
8 What are the applications of Equalizers?
9 Test Whether the polynomial $P(S) = 2s^4 + 5s^3 + 6s^2 + 2s + 1$ is Hurwitz.
10 List the properties of positive Real function.

PART – B (5 x 10 = 50 Marks)

11. a) Determine the admittance parameters of the T network shown below



b) Define ABCD parameters of a Two Port network. Establish the relation between Admittance parameters and ABCD Parameters.

12. a) For L-network has series arm impedance-j500Ω and shunt arm impedance is j1000 Ω. Determine its iterative and image impedances
b) A symmetrical π network consists of a series arm of 300 Ω and two shunt arms of 600 Ω each. Determine characteristic impedance and propagation constant of Network.

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Code No.2904/AICTE

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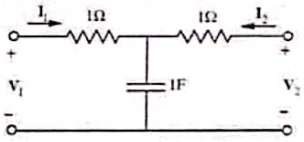
13. a) Design a constant 'K' T-section low pass filter having cutoff frequency of 2kHz and nominal characteristic impedance of 600 ohms.
b) i) What is a high pass filter? In what respects it is different from a low pass filter and derive the equations to find the inductances and capacitances of a constant K high pass filter.

14. a) Design an asymmetrical T-attenator so that it works between a source and load impedance of 250 ohms and 480 ohms respectively and provides an attenuation of 40dB.
b) In a symmetrical T-attenuator the series arm resistance is 1200 ohms calculate the load resistance if attenuation is 40 db.

15. a) Synthesis Y(S) = S(S+2)/(S+1)(S+2) is Foster Forms.
b) Synthesize the following LC impedance function using the cauer Form I

$$Z(s) = \frac{s(s^2+4)(s^2+6)}{(s^2+3)(s^2+5)}$$

16. a) Determine the transmission parameters in the S domain for the network shown.



b) Obtain the expressions for the image and iterative impedances of an asymmetrical Pi-network.

17. a) Answer any two of the following
i) Calculate the elements of a band elimination filter to suppress harmonic whistles between 8.5 KHz to 9.0 KHz. The filter has to work between terminal impedances of 2000Ω.
ii) The attenuation and characteristic impedance of a symmetrical lattice attenuator are 40 dB and 450 ohms . Design the network.
iii) Determine whether the following functions are positive real.
Z(s) = (s+3)/(s+2)

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Code No. : 5138/O

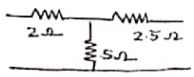
FACULTY OF ENGINEERING
B.E. 2/4 (ECE) II Semester (Old) Examination, May/June 2012
NETWORKS AND TRANSMISSION LINES

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. Define the 'h' parameters of a two port network. 2
2. Find the equivalent Π-network for the given T-network. 3

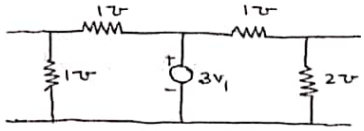


3. Define the reciprocity theorem. 2
4. Define the characteristic impedance of a transmission line. 2
5. A lossless transmission line with a characteristic impedance of 400Ω is terminated in a resistive load of 200Ω. Determine the percentage of reflected power. 3
6. Specify the reflection coefficient and SWR values for the following loads
   a) Short circuit b) Open circuit c) Matched load 3
7. What are the characteristics of a quarter wave transmission line ? 2
8. Determine the 'L' and 'C' values of a constant K low pass filter with a cutoff frequency of 2 kHz to be terminated in a resistive load of 600Ω. 3
9. Why composite filter is terminated in m derived half section ? Explain. 2
10. Given the normalized impedance as (r + j x), how do you determine the normalized admittance using Smith Chart. 3

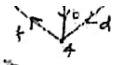
Code No. : 5138/O

PART – B (50 Marks)

11. Define the 'y' parameters of a two port network. Determine 'y' parameters for the network shown below. 10

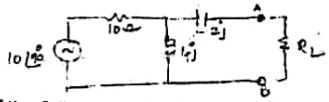


12. Draw the equivalent circuit of a transmission line and derive expressions for the characteristic impedance and propagation constant in terms of the primary constants of the line. 10
13. a) What is an attenuator ? Derive the necessary equations for the design of a symmetrical Π attenuator. 5
    b) Design a symmetrical Π attenuator to provide a design impedance of 400Ω and an attenuation of 20 dB. 5
14. What is a composite filter ? What are the various sections of a composite filter and briefly explain the importance of each Section. 10
15. A load $Z_L = (100 - j\,50)\,\Omega$ is connected to a transmission line whose characteristic impedance is 50 Ω. Using Smith Chart calculate the point nearest to the load at which a quarter wave transformer may be inserted to provide correct matching. Also determine the characteristic impedance of the quarter wave transformer that provides correct matching. 10
16. Define the image and iterative impedances of a network. Derive expressions for the image and iterative impedances for asymmetrical T-network. 10
17. Write short notes on the following : 10
    a) Double stub matching
    b) Notch filter.

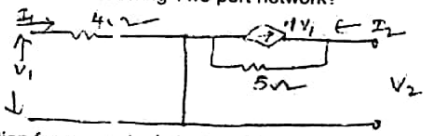


4 Explain briefly about power triangle?

5 In the following circuit find the condition for maximum power transfer when the load is resistive

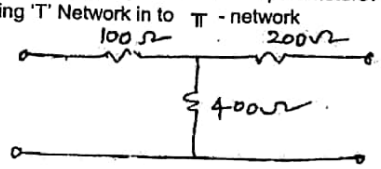


6 Find 'h' Parameters of the following Two port network?



7 Derive the condition for symmetry in terms of 'Z' parameters?

8 Convert the following 'T' Network in to π - network



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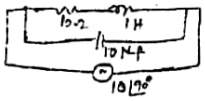
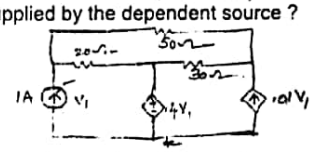
9 Find the resonant frequency of the following circuit?



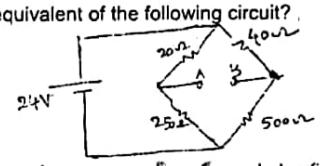
10 Explain briefly about zero state response?

PART B (50 Marks)

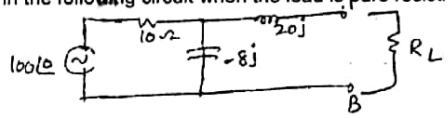
11 a) Find V_1 and power supplied by the dependent source ?



b) Find the Thevenin's equivalent of the following circuit?

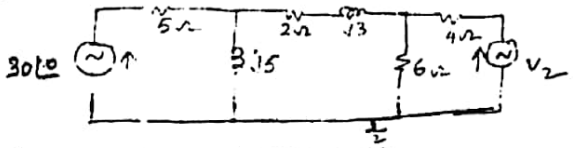


12 a) Find the condition for maximum power transfer and also find maximum power delivered to the load in the following circuit when the load is pure resistive?

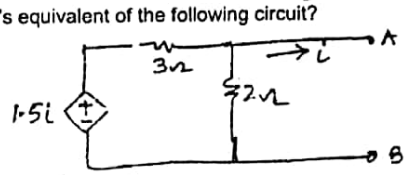


b) Prove that maximum energy stored in capacitor is CV^2

13 a) For the circuit determine the value of V_2 Such That current in the (2+j3) Ω impedance is zero



b) Find the Norton's equivalent of the following circuit? (5)



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Code No. 5063 / N / S

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (New) (Suppl.) Examination, June 2016

Subject: Basic Circuit Analysis

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

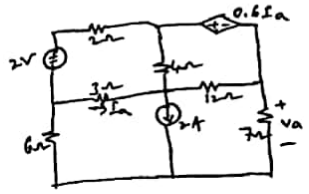
Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 Distinguish between independent and dependent sources. 3
2 State and explain Tellegen's theorem. 2
3 Define zero input response and zero state response. 3
4 What is damping in RLC circuits? Explain. 2
5 What is power triangle? Explain. 3
6 What is power factor? What is its value for R, L and C components? 2
7 What are practical and ideal transformers? 3
8 Draw equivalent network of Y-parameters. 2
9 Calculate Q, fo and bandwidth for parallel resonant circuit if R = 2Ω, L = 1H and C = 1 mF. 3
10 Define bandwidth and quality factor and relate them. 2

PART – B (5x10 = 50 Marks)

11 Find power supplied by independent voltage source and calculate V_a and I_a in the circuit shown using mesh analysis. 10



12 Find $V_c(t)$ for the circuit shown below for $t \geq 0$. 10

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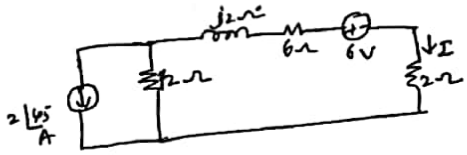
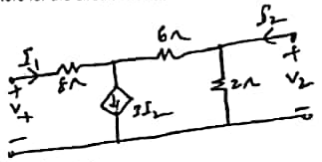
13 Find current in 2Ω resistor using Thevenin's theorem. 10



14 a) Find h-parameters for the circuit shown. 7

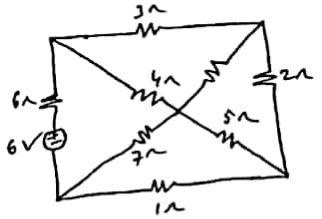


b) State and explain reciprocity theorem. 3

15 a) Find bandwidth of series RLC circuit in terms of quality factor and resonant frequency. 6

b) Explain how to obtain natural response from pole-zero plot. 4

16 Write cut-set schedule and solve for branch voltages and branch currents. 10



17 Write short notes on:
a) Power in AC circuit
b) Interconnection of two port networks.
c) Pole-zero constellation.

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Code No: 11408/CBCS

FACULTY OF ENGINEERING

B.E.(ECE) III Semester (CBCS) (Main & Backlog) Examination, Dec. 2018/Jan. 2019

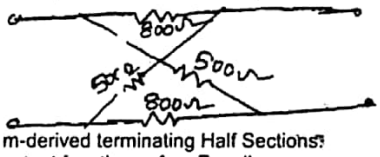
Subject: Network Analysis & Synthesis

Time: 3 Hours **Max. Marks: 70**

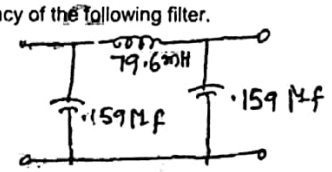
Note: Answer all questions from Part A & any five questions from Part B

PART – A (10x2=20Marks)

1. Define Image Transfer Constant and Propagation Constant of a network.
2. Find the Characteristics Impedance of the following Network.



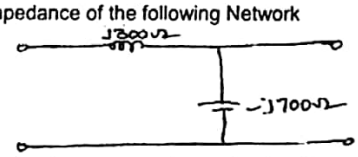
3. Justify that m-0.6 for m-derived terminating Half Sections.
4. Mention any Two important functions of an Equalizers.
5. Design a symmetrical π Attenuator having an attenuation of 60dB and a nominal impedance of 600Ω
6. Test Whether the following polynomial is Hurwitz or not $s^4+s^3+3s^2+2s+12$.
7. Test Whether the following system is stable or Not using RH Criteria $s^5+4s^4+6s^3+3s^2+6s+5$
8. Mention the Properties of Positive Real Functions.
9. Find the cutoff Frequency of the following filter.



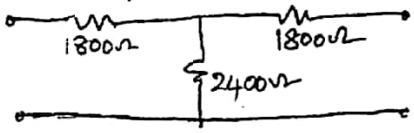
10. Derive the condition for a filter to lie in Pass Band.

PART – B (5x10=50 Marks)

11.(a) Find the Image Impedance of the following Network



(b) Find the Characteristics Impedance of the following Network. Derive the formulae you use.



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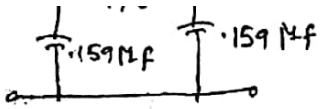
Code No: 11408/CBCS

12 (a) Design a m-Derived High Pass Filter(T-Section) having a cutoff frequency of 4KHz and Frequency of Infinite attenuation 3KHz and a nominal Impedance of 500Ω.
(b) Design a Band Pass Filter with a Cut off Frequencies of 10KHz, 12 KHz and a Nominal Impedance of 600Ω

13 (a) Design a Composite High Pass Filter(π Section) having a Cutoff Frequency of 6 KHz Frequency of Infinite Attenuation is 5KHz, and a Nominal impedance of 600Ω.
(b) Find the Frequency at which Proto type T-section Low Pass Filter h... Frequency of f_c have an Attenuation of 15dB.

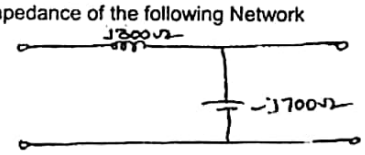
14 (a) Design a Symmetrical Bridge T Attenuator having an Attenuation o... Nominal Impedance of 600Ω. Derive the Formulae you use.
(b) Design a Full Series Equalizer for a Design Resistance of 600Ω and an attenuation



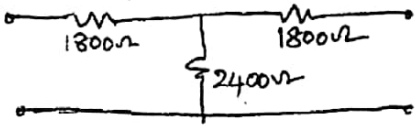
10. Derive the condition for a filter to lie in Pass Band.

PART – B (5x10=50 Marks)

11.(a) Find the Image Impedance of the following Network



(b) Find the Characteristics Impedance of the following Network. Derive the formulae you use.



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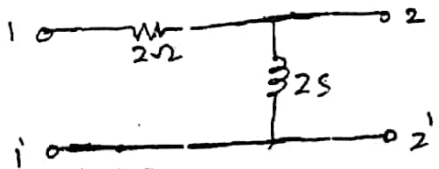
Code No: 11408/CBCS

12 (a) Design a m-Derived High Pass Filter(T-Section) having a cutoff frequency of 4KHz and Frequency of Infinite attenuation 3KHz and a nominal Impedance of 500Ω.
(b) Design a Band Pass Filter with a Cut off Frequencies of 10KHz, 12 KHz and a Nominal Impedance of 600Ω

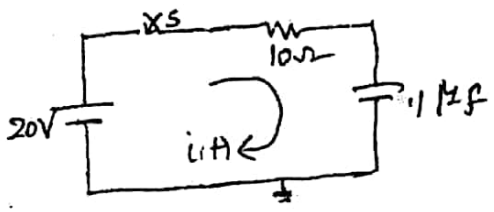
13 (a) Design a Composite High Pass Filter(ρ Section) having a Cutoff Frequency of 6 KHz Frequency of Infinite Attenuation is 5KHz, and a Nominal impedance of 600Ω.
(b) Find the Frequency at which Proto type T-section Low Pass Filter having a Cut off Frequency of f_c have an Attenuation of 15dB.

14 (a) Design a Symmetrical Bridge T Attenuator having an Attenuation of 60dB, and a Nominal Impedance of 600Ω. Derive the Formulae you use.
(b) Design a Full Series Equalizer for a Design Resistance of 600Ω and an attenuation of 12dB at 800Hz.

15 (a) For the Network shown Find the Driving Point Impedance, Transfer Impedance Z_{21}



(b) Find the Current i(t) in the following Circuit Using Laplace Transformations Switch closed at t=0, Assume all the initial conditions are zero.



16 (a) The Driving Point Impedance of LC Network is given by $Z(s)=s^4+4s^2+3/s^3+2s$ Synthesize using second Cauer Method.
(b) The Driving Point Impedance of RL Network is given by
$Z(s)=5(s+1)(s+4)/(s+3)(s+5)$
Synthesize using Foster First Method.

17 Answer any Two of the following
a) Properties of Positive Real Functions
b) Derive the Characteristic Impedance of a Lattice Network
c) Find the Laplace Transform of the following Waveform.

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Code No. 442/CBCS

FACULTY OF ENGINEERING

B.E. (ECE) III-Semester (CBCS)(Main) Examination, December, 2017

Subject : Network Analysis & Synthesis

Time : 3 hours **Max. Marks : 70**

Note : Answer all questions from Part-A and any Five Questions from part-B

PART – A (20 Marks)

1. Define image parameters and find image parameters in terms of short circuit and open-circuit parameters.
2. For a two port network, Z-parameters are Z_{11}=50 Ω , Z_{12} =Z_{21}=25 Ω and Z_{22} = 30Ω. Compute ABCD parameters of network.
3. Differentiate Active and Passive filter?
4. Design a m-derived low pass filter having a cut-off frequency of 1KHz, design impedance of 400 ohms, and resonant frequency 1100Hz. Obtain T-section filters.
5. The expression of N in a full series equalizer considering Z_1 as inductor and Z_2 as capacitor is?
6. Derive an expression for design impedance.
7. State two properties of the R-L driving point Impedance function.
8. What is the relationship between the transfer function and impulse response? Elaborate.
9. What is positive real functions? Write the properties of positive real functions.
10. Write the properties of RC and RL immittances.

PART – B (50 Marks)

11. a) Find the Z-Parameter of the circuit shown in figure 1.

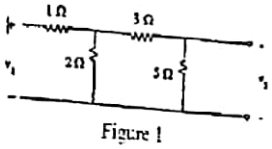

Figure 1

b) Prove that in a parallel –parallel interconnected two networks $[Y_A]$ and $[Y_B]$ respectively, the overall Y-matrix is given as $[Y]=[Y_A]+[Y_B]$.

12. a) Design a prototype band pass filter section having cut-off frequencies of 2000Hz and 5000Hz and nominal characteristic impedance of 600Ω .

b) Explain nominal characteristic impedance R_0 of a band –stop filter or band-reject filter. Derive design parameters R_1 , R_2 , C_1 and C_2 of a band-reject filter in terms of corner frequencies.

Code No. 442 / CBCS

13. a) An π attenuator has been shown in figure 2, find Y parameter and draw the equivalent Y-parameter circuit.

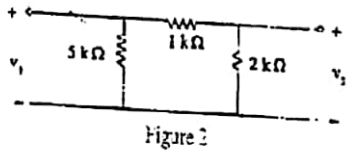

Figure 2

b) Explain the theory of P-type and L-type attenuator?

14. a) What do you mean by simple pole/zero, repeated pole/zero, complex conjugate pole/zero? Find the pole = 200 location of the current transfer ratio I_2/I_1 in the s-domain for the circuit shown in figure 3:

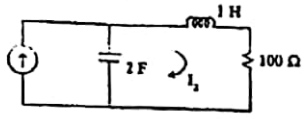

Figure 3

b) The unit-step response of a linear system is $r(t) = (2e^{-2t} - 1)u(t)$
   i) Find the response r(t) to the input f(t) = t u(t).
   ii) Sketch the response.

15. a) Test whether the polynomial P(s) is Hurwitz or not.
   i) $s^5 + 3s^2 + 2s$ ii) $s^4 + 5s^3 + 5s^2 + 4s + 10$

b) Find the Cauer forms of the RL impedance functions.
   $Z(s) = 2(s+1)(s+3) / (s+2)(s+6)$

16. a) Derive the Relation between Z and Transmission parameters?

b) Discuss about the effect of Resistance on filter operation?

17. a) Write about Restriction on location of poles and zeros in driving point function?

b) The impedance function of a network is given by
   $Z(s) = 6s^3+5s^2+6s+4/2s^3+2s$. Realise the network?

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