Ref No:

SRI KRISHNA INSTITUTE OF TECHNOLOGY, BANGALORE

COURSE PLAN

Academic Year 2019-20

Program:	B E – Electronics and Communication Engineering
Semester :	3
Course Code:	18EC32
Course Title:	Network Theory
Credit / L-T-P:	4 / 4-0-0
Total Contact Hours:	50
Course Plan Author:	M.NAGARAJA

Academic Evaluation and Monitoring Cell

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EC
Prepared by

Checked by

Approved

–

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Note : Remove "Table of Content" before including in CP Book

Each Course Plan shall be printed and made into a book with cover page

Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

18EC32 : Network Theory

A. COURSE INFORMATION

1. Course Overview

Degree:	B.E	Program:	ECE
Year / Semester :	3rd	Academic Year:	2019-20
Course Title:	Network Theory	Course Code:	18EC32
Credit / L-T-P:	50-10-0	SEE Duration:	180 Minutes
Total Contact Hours:	60	SEE Marks:	75 Marks
CIA Marks:	60	Assignment	1 / Module
Course Plan Author:	M.Nagaraja	Sign	Dt:
Checked By:		Sign	Dt:

2. Course Content

Module	Module Content	Teaching Hours	Module Concepts	Blooms Level
1	Practical sources,source transformation,network reduction using star-delta transformations,loop and node analysis with linearly dependent and independent sources for DC and AC networks,concepts of super node and super mesh	13	Transformations loop and node analysis	L4
2	Superposition,Reciprocity, Millman's theorems, Thevini's and Norton's Theorems ,Maximum power transfer theorem	15	Network Theorems	L4
3	Behavior of circuit elements under switching condition and their representation,evaluation of initial and final conditions in RL,RC and RLC circuits for AC and DC excitations Solutions of networks ,step,ramp and impulse response, waveform synthesis	10	Circuit Switching s-domain analysis	L4
4	Series and parallel resonance, frequency response of series and parallel circuits , q-factor ,bandwidth	10	Resonance	L3
5	Definition of Z,Y,h and Transmission parameters, modeling with these parameters,relationship between parameters sets	12	Network Modeling	l4
6				

3. Course Material

Modules	Details	Chapters in Book	Availablity
A	**Text books (Title, Authors, Edition, Publisher, Year.)**		**-**
1,2,3,4,5	Text books – M.E Van Valkenberg " Network analysis"		In Lib
	Roy choudhury – "Networks and systems"		In Lib
B	**Reference books (Title, Authors, Edition, Publisher, Year.)**	**-**	**-**
1	Reference books – Hayt,kemmerly and durbin" Engineering circuit analysis"		
	J.David Irwin " Basic Engineering circuit Analysis"		In dept
	Charles k Alxander and Mathew sadiku "Fundamentals of Electric circuits		
C	**Concept Videos or Simulation for Understanding**	**-**	**-**
	https://www.youtube.com/watch?v=b_ct7xMtKMI Network Theory		
	https://www.youtube.com/watch?v=qFcuovfgPTc Network Introduction		
	https://www.youtube.com/watch?v=LiaQjqYa8R0 Resonance		
	https://www.youtube.com/watch?v=pn777Ya0OHk 2 port Network		
	https://www.youtube.com/watch?v=gk7HNFBXi_c Initial conditions		
D	**Software Tools for Design**		
	PSPICE, SPICE, ORCAD		
E	**Recent Developments for Research**	**-**	**-**
	The topics of recent developments in Network theory include the compound matrices in network theory; the synthesis of linear three-terminal networks composed of two kinds of elements; the flow-graph and signal flow-graph analysis of linear systems; the non-linear circuit theory by the methods of classical dynamics; and the search for a complete set of basic elements for the synthesis of non-linear electrical systems		
F	**Others (Web, Video, Simulation, Notes etc.)**	**-**	**-**
1	Network theory conceps Materials Gate https://testbook.com/blog/basic-network-theory-concepts-gate-study-material-pdf/		
2	**Network Theory** Made Easy **study material** for GATE, IES, PSUs exam preparation in the form of handwritten notes. *https://easyengineering.net/network-theory-made-easy/*		

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

EC

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Students must have learnt the following Courses / Topics with described Content . . .

Modules	Course Code	Course Name	Topic / Description	Sem	Remarks	Blooms Level
1	ELE15	Basic Electrical	Network Laws	1		L2
2	ELE15	Basic Electrical	Electric Motors	1		L2
3	ELE15	Basic Electrical	Network Elements	1		L2
4						
5						

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.

Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

Modules	Topic / Description	Area	Remarks	Blooms Level
1	Network reduction techniques	Electrical		L2
2	Network Theorems	Network Analysis		L3
3	Initial Conditions	Network Analysis		L3
4	Laplace Transformation	Network Analysis		L2
5	2 port network and Resonance	Filter		L3

B. OBE PARAMETERS

1. Course Outcomes

Module	CO#	Cos **At the end of the course, student should be able to . . .**	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
1	18EC32.1	Reduce the circuit complexity and apply Kirchhoff's laws to solve the network.	13	Transformation loop and node analysis	Lecture	CIA Assignment	L4 Analyze
2	18EC32.2	Solve network problems by using principle of theorems	15	Network Theorems	Lecture	CIA Assignment	L4 Analyze

3	. 18EC32.3	Calculate current and voltages of a network to understand switching analysis of networks by solving integro- diffrential equations	05	Circuit switching	Lecture	CIA Slip Test Assignment	L4 Analyze
4	. 18EC32.4	Apply Laplace transform to solve network problems	05	S-domain analysis	Lecture / PPT	Assignment CIA	L4 Analyze
5	. 18EC32.5	Evaluate RLC elements in Resonant circuits.	10	Resonance	Lecture	CIA Assignment	L4 Analyze
5	18EC32.6	Apply two port network parameters to solve given network.	12	Network Modeling	Lecture and Tutorial	Assignment	L4 Analyze
	-	**Total**	**60**	-	-	-	-

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

2. Course Applications

SNo	Application Area	CO	Level
1	Protection of power systems	CO1	L4
2	Audio power amplifiers,Transmission line drive calculation	CO2	L4
3	Multistage wide band amplifiers,Power flow algorithms	CO3	L4
4	Linear dynamical systems	CO4	L4
5	Tuning radio and audio receivers,	CO5	L2
6	Reciprocal networks	CO6	L2
7		CO7	L3
8		CO8	L2
9		CO9	L2
10		CO10	L4

Note: Write 1 or 2 applications per CO.

3. Mapping and Justification

CO – PO Mapping with mapping Level along with justification for each CO-PO pair.
To attain competency required (as defined in POs) in a specified area and the knowledge & ability required to accomplish it.

Modules	Mapping		Mapping Level	Justification	Level
	CO	**PO**	-	-	-
1	CO1	PO1	L3	Students will be able to learn and apply all the basic equations of maths, physics and its importance in network analysis	L3
1	CO1	PO2		Students will be able to analyze, evaluate and design	

			L4	solutions to solve complex engineering problems for that , economically feasible and socially acceptable	L4
1	CO1	PO5	L4	Offer engineering solutions by usage of modern tools to meet needs of people.	L4
1	CO2	PO1	L3	Students will be able to learn and apply all the basic equations of maths, physics and its importance in network analysis	L3
1	CO2	PO2	L4	Students will be able to analyze, evaluate and design solutions to solve complex engineering problems for that , economically feasible and socially acceptable	L4
1	CO2	PO5	L4	Offer engineering solutions by usage of modern tools to meet needs of people.	L4
2	CO3	PO1	L3	Students will be able to learn and apply all the basic equations of maths, physics and its importance in network analysis	L3
2	CO3	PO2	L4	Students will be able to analyze, evaluate and design solutions to solve complex engineering problems for that , economically feasible and socially acceptable	L4
2	CO3	PO5	L4	Offer engineering solutions by usage of modern tools to meet needs of people.	L4
3	CO4	PO1	L3	Students will be able to learn and apply all the basic equations of maths, physics and its importance in network analysis	L3
3	CO4	PO2	L4	Students will be able to analyze, evaluate and design solutions to solve complex engineering problems for that , economically feasible and socially acceptable	L4
3	CO4	PO5	L4	Offer engineering solutions by usage of modern tools to meet needs of people.	L4
4	CO5	PO1	L3	Students will be able to learn and apply all the basic equations of maths, physics and its importance in network analysis	L3
4	CO5	PO2	L3	Students will be able to analyze, evaluate and design solutions to solve complex engineering problems for that , economically feasible and socially acceptable	L3
4	CO5	PO5	L3	Offer engineering solutions by usage of modern tools to meet needs of people.	L3
5	CO6	PO1	L3	Students will be able to learn and apply all the basic equations of maths, physics and its importance in network analysis	L3
5	CO6	PO2	L4	Students will be able to analyze, evaluate and design solutions to solve complex engineering problems for that , economically feasible and socially acceptable	L4
5	CO6	PO5	L4	Offer engineering solutions by usage of modern tools to	L4

				meet needs of people.	

Note: Write justification for each CO-PO mapping.

4. Articulation Matrix

CO – PO Mapping with mapping level for each CO-PO pair, with course average attainment

	–	Course Outcomes	Program Outcomes											
Module	CO#	Cos **At the end of the course student should be able to . . .**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Level
1	C 18EC32.1	Reduce the circuit complexity and apply Kirchhoff's laws to solve the network.	3	3	–	–	2	–	--	–	–	–	–	–	L3
2	C 18EC32.2	Solve network problems by using principle of theorems	3	3	–	–	2	–	–	–	–	–	–	–	L4
3	C 18EC32.3	Calculate current and voltages of a network to understand switching analysis of networks by solving integro-diffrential equations	3	3	–	–	2	–	–	–	–	–	–	–	L4
4	C 18EC32.4	Apply Laplace transform to solve network problems	3	3	–	–	2	–	–	–	–	–	–	–	L4
5	C 18EC32.5	Evaluate RLC elements in Resonant circuits.	3	3	–	–	2	–	–	–	–	–	–	–	L3
5	C 18EC32.6	Apply two port network parameters to solve given network.	3	3	–	–	2	–	–	–	–	–	–	–	L4
	Average attainment (1, 2, or 3) ***PO, PSO*** *1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage; 6.The Engineer and Society; 7.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; S1.Software Engineering; S2.Data Base Management; S3.Web Design*													

5. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs

Module	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1	Basic Network Laws	Seminar	Sept 19	Faculty	

1	Basic Network reduction techniques	Seminar	Sept 19	Faculty	
1	Polar to rectangular and vice versa	Seminar	Oct 19	Faculty	
2	Solving simultaneous equations using Matrix Method	Seminar	Oct 19	Faculty	
5					

Note: Write Gap topics from A.4 and add others also.

6. Content Beyond Syllabus

Topics & contents required (from A.5) not addressed, but help students for Placement, GATE, Higher Education, Entrepreneurship, etc

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1	Network Simulation	Lab Practice	OCT 19	Faculty	
2	Filter Design	Seminar	OCT 19	Faculty	
3	Notch Filter Design	Seminar	OCT 19	Faculty	
4	H-parameter analysis	Seminar	OCT 19	Faculty	
5					
6					
7					
8					
9					
10					

Note: Anything not covered above is included here.

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation. Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

Module #	Title	Teaching Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Basic concepts	13	2	-	-	1	1	2	CO1	L4

2	Network Theorems	15	2	–	–	1	1	2	CO2	L4
3	Transient behavior and initial conditions Laplace transformation and applications	10	–	2	–	1	1	2	CO3 CO4	L4
4	Resonant circuits	10	–	2	–	1	1	2	CO5	L3, L4
5	Two port network parameters	12	–	–	4	1	1	2	CO6	L4
-	**Total**	**60**	**4**	**4**	**4**	**5**	**5**	**10**	**-**	**-**

Note: Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

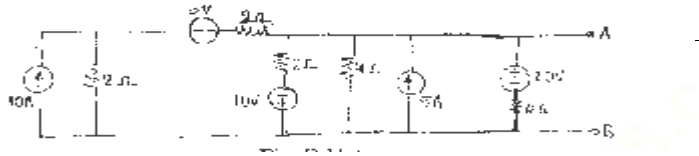
Evaluation	Weightage in Marks	CO	Levels
CIA Exam – 1	30	CO1, CO2, CO3, CO4	l3, l4
CIA Exam – 2	30	CO5, CO6, CO7, C08	L3, L4
CIA Exam – 3	30	CO9, CO10	L3, L4
Assignment – 1	05	CO1, CO2, CO3, CO4	L3, L4
Assignment – 2	05	CO5, CO6, CO7, CO8	L3, L4
Assignment – 3	05	CO9, CO10	L3, L4
Other Activities – define – Slip test		CO1 to Co9	L2, L3, L4 . ..
Final CIA Marks	**40**	**-**	**-**

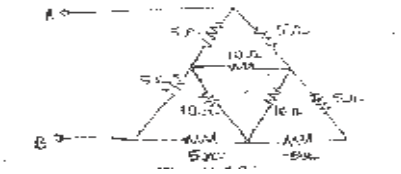
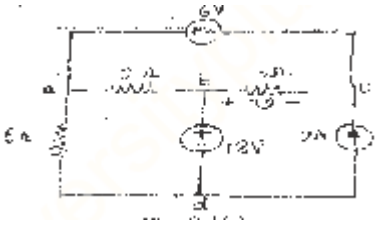
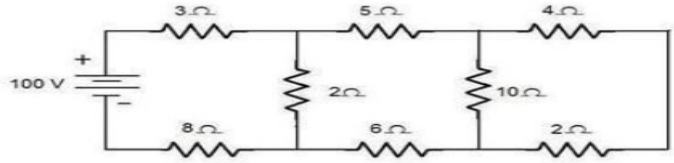
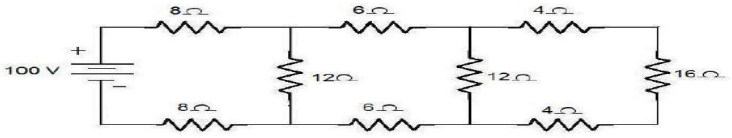
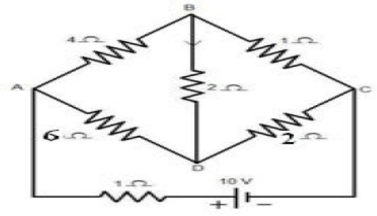
Note : Blooms Level in last column shall match with A.2 above.

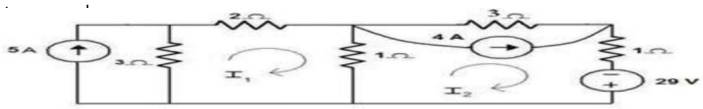
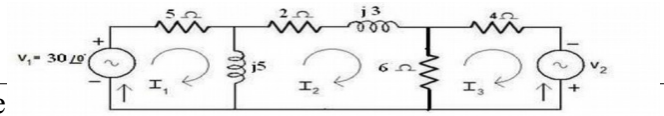
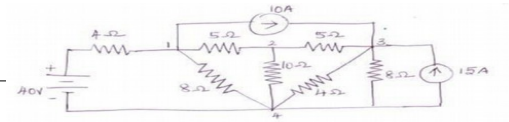
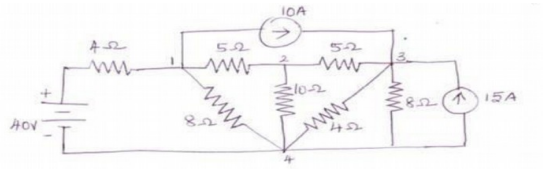
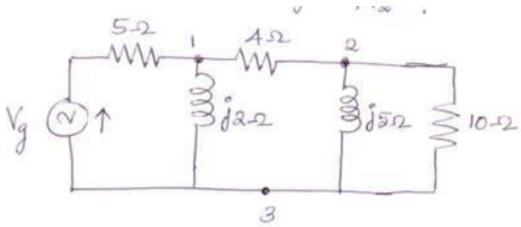
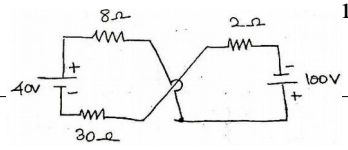
D1. TEACHING PLAN – 1

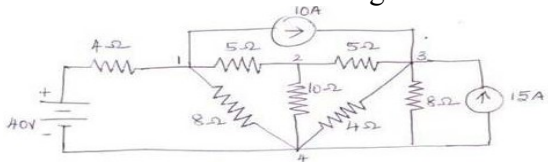
Module – 1

Title:	Basic concepts	Appr Time:	16 Hrs
a	***Course Outcomes***	–	**Blooms**
–	The student should be able to:	–	**Level**
1	Reduce the circuit complexity and apply Kirchhoff's laws to solve the network.	CO1	L4

b	***Course Schedule***	–	–
Class No	**Module Content Covered**	**CO**	**Level**
1	Introduction to Network analysis	CO1	L2
2	Practical sources	CO1	L3
3	Source Transformations and numericals	CO1	L4
4	Star delta and delta to star transformations and numericals	CO1	L4
5	Concept of KVL and Kcl and simple examples	CO1	L4
6	Numerical on loop analysis	CO1	L4
7	Numericals on loop analysis	CO1	L4
8	Numericals on node analysis	CO1	L4
9	Numericals on node analysis	CO1	L4
10	Concept of super mesh and super node analysis	CO1	L4
11	Numericals on super mesh analysis	CO1	L4
12	Numericals on super node analysis	CO1	L4
13	Class test		
14			
15			
16			
c	**Application Areas**	**CO**	**Level**
1	Protection of power systems	CO1	L4
2			
d	**Review Questions**	–	–
1	List the differences between linear and nonlinear circuits,Active and passive elements.	CO1	L1
2	Derive the expression for star to delta and delta to star transf	CO1	L3
3	 Convert the network into single wotlage source using source transformations	CO2	L2

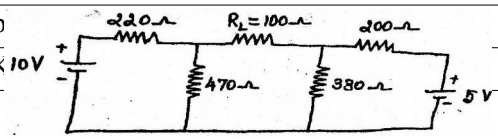
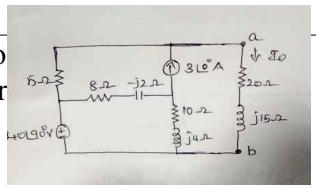
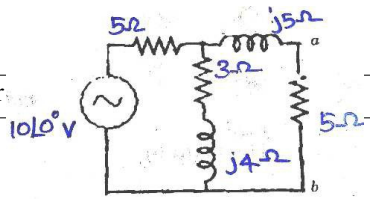
4	Draw the equivalent resistance at terminlas a and b in the networks. 	CO2	L4
5	Find voltage v across 3ohms using nodal analysis 	CO2	L2
6	Using source transformation find the power deliverd to the load by 50v source. 	CO2	L5
7	Find the current through each branch by network reduction technique. 	CO2	L2
8	Calculate a) the equivalent resistances across the terminals of the supply, b) total current supplied by the source and c) power delivered to 16 ohm resistor in the circuit shown in figure 	CO2	L3
9	In the circuit shown, determine the current through the 2 ohm resistor and the total current delivered by the battery. Use Kirchhoff's laws. 	CO2	L4

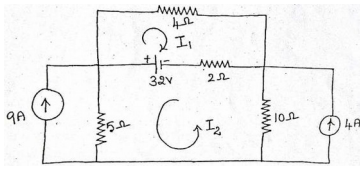
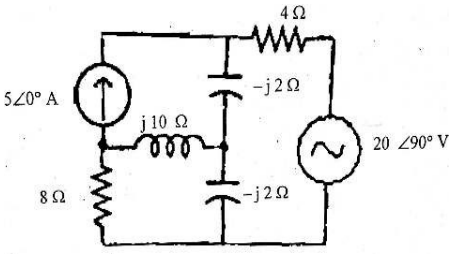
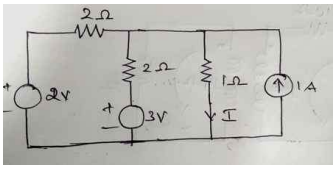
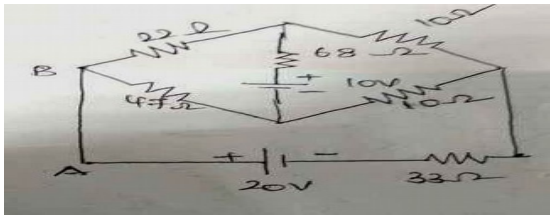
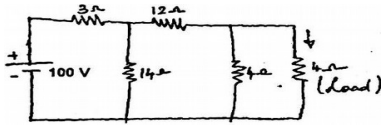
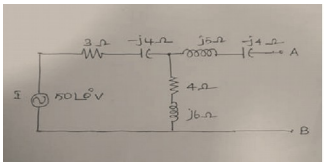
			
10	Determine the mesh currents I1 and I2 for the given circuit shown below 	CO1	L1
11	Determine the value of V2 such that the current through the impedance (2+j3) ohm is zero. 	CO1	L4
12	Use Nodal Voltage method and find the power dissipated in the 10 Ω resistance on the circuit shown in th fig 		
13	Given the nodes 1 and 2 in network of figure, Find the ratio of voltage V1 / V2 		
14	Given nodes 1 and 2 in the network. Find v1/v2 .		
15	List the advantages of super mesh analysis.		
16	List the advantages of super mesh analysis.		
17	Find the current I and voltage across 30 Ω of the circuit shown in fig. 		

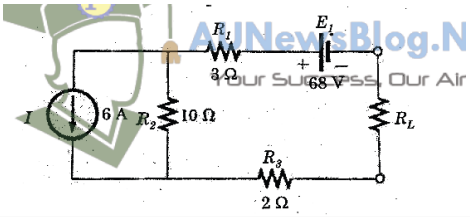
18	Use Nodal Voltage method and estimate the power dissipated in the 10 Ω resistance on the circuit shown in the fig. 		
e	**Experiences**	–	–
1		CO1	L2
2			
3			
4		CO3	L3
5			

Module – 2

Title:	Network Theorems	Appr Time:	10 Hrs
a	***Course Outcomes***	–	**Blooms**
–	The student should be able to:	–	**Level**
1	Solve network problems by using principle of theorems	CO3	L4
2		CO4	L3
b	***Course Schedule***	–	–
Class No	**Module Content Covered**	**CO**	**Level**
17	Thevinis theorem , norton's theorem		
18	Numericals on thevinin's and norton's theorem		
19	Numericals continued		
20	Superposition theorem		
21	Numericals on superpostion theorem		
22	Numericals continued		
23	Maximum power transfer theorem		
24	Numericals on maximum power transfer		
25	Reciprocity theorem		
26	Numericals on reciprocity theorem		
27	Millman's theorem		
28	Numericals on millman's theorem		
29	Numericals on theorems		
	Numericals		
30	Test		
c	**Application Areas**	**CO**	**Level**

1	Audio power amplifiers,Transmission line drive calculation	CO3	L3
2		CO4	L4
d	**Review Questions**	–	–
19	Explain the concep 	CO3	L1
20	State and explain K	CO4	L3
21	c	CO3	L2
22	Apply Norton theorem to determine current I_0 for the given circuit in fig. 		
23	What is the condition for maximum power 	CO4	L4
	Find the current through the branch a-b of the network shown in fig using Thevenin's theorem.		

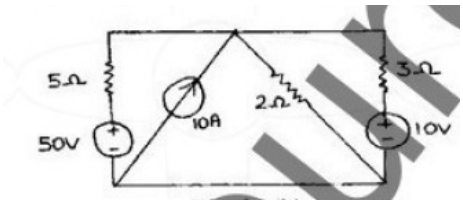
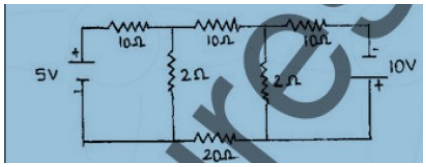
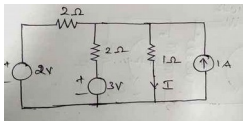
24	Estimate the current through 5 Ω resistor using superposition theorem, in the circuit shown in fig.  Use the superposition theorem to find the current through 4Ω resistor in the circuit shown in fig.  	CO4	L2
25	State and explain Superposition theorem?	CO3	L5
26	State and explain maximum power transfer theorem/	CO3	L2
27	State and explain milliman's theorem.	CO3	L3
28	Find Norton's equivalent for the following circuit.  		
29	Find the power delivered by the 20 V Source using superposition theorem.  		
30	state and explain Norton's theorem?	CO1	L2
31	Verify the reciprocity theorem for the network shown in fig .  		
32	Determine the Thevenin's equivalent across AB for the given circuit  		
33	Find the value R_L in the fig for maximum power to R_L and calculate	CO3	L3

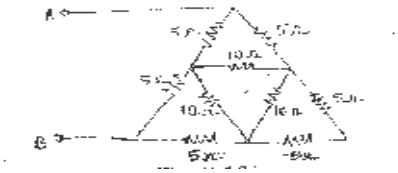
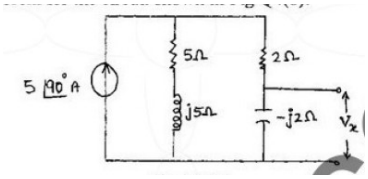
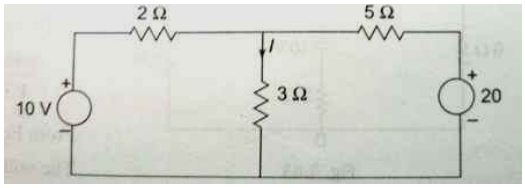
	the maximum power. 		
e			

E1. CIA EXAM – 1

a. Model Question Paper – 1

Crs Code:	CS501PC	Sem:	I	Marks:	30	Time:	75 minutes
Course:	Design and Analysis of Algorithms						

-	-	**Note: Answer any 3 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1	a	Derive star to delta and delta transformations.	20	CO1	L1
	b	Using source transformation find the 50v source shown in fig below. 			L2
	c	Find the voltage across 20ohm resistor shown in fig using mesh analysis. 		CO2	L3
	d				L1
2	a	Find Norton's equivalent for the following circuit. 	20		L2

	b	State and explain with neat figures thevinin's theorem.			L4
					L3
					L2
3	a	Define the following I) Linear and non linear devices ii) Passice and active elements iii) Unilateral and bi lateral networks	20	CO3	L1
	b	Find the equivalent resistance across A and B. 		CO4	L2
	c				L1
	d				L2
4	a	State and prove thevinin's theorem.	20		L2
	b	Find the current through 5 ohm resistor showm in fig and hence verify reciprocity theorem. 			L2
	c	Calculate the current I shown in figure using Milman's theorem 			L1
	d				L3

b. Assignment -1

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions

Crs Code:	CS501PC	Sem:	I	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	Design and Analysis of Algorithms						

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

SNo	USN	Assignment Description	Marks	CO	Level
1	1KT18EC001	Explain the concept of source transformation?	5	CO1	L2
2	1KT18EC003	State and explain Kirchhoff's laws?	5	CO2	L3
3	1KT18EC005	Using nodal analysis find all branch currents for the following circuit		CO2	L4
4	1KT18EC008	What is the condition for maximum power transfer to the load?	5	CO1	L3
5	1KT18EC009	Find Thevenin's equivalent for the following circuit.			
6	1KT18EC010	State and explain Superposition theorem?			
7	1KT18EC011	Verify Superposition theorem for 4Ω resistor for the following circuit.			
8	1KT18EC012	State and explain milliman's theorem.			
9	1KT18EC013	Find Norton's equivalent for the following circuit.			
10	1KT18EC014	Find branch currents for the following circuit.			
11	1KT18EC015	state and explain Norton's theorem?			
12	1KT18EC016	Verify the reciprocity theorem for the network shown in fig .			
13	1KT18EC017	Explain the concept of source transformation?			
14	1KT18EC018	State and explain Kirchhoff's laws?			
15	1KT18EC019	Using nodal analysis find all branch currents for the following circuit			
16	1KT18EC020	What is the condition for maximum power transfer to the load?			
17	1KT18EC021	Find Thevenin's equivalent for the following			

		circuit.			
18	1KT17EC001	State and explain Superposition theorem?			
19	DIP	Verify Superposition theorem for 4Ω resistor for the following circuit.			
20	1KT16EC030	State and explain milliman's theorem.			
21	DIP	Find Norton's equivalent for the following circuit.			
22	DIP	Find branch currents for the following circuit.			
23	DIP	state and explain Norton's theorem?			

D2. TEACHING PLAN - 2

Module - 3

Title:	Transient behaior and initial conditions	Appr Time:	16 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Calculate current and voltages of a network to understand switching analysis of networks by solving integro- diffrential equations	CO3	L2
2	Apply Laplace transform to solve network problems	CO4	L3
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	Introduction to transient behavior and initial condition.	CO3	L4
2	Behavior of circuit elements under switching condition and their representation.	CO3	L4
3	Continuation of representations	CO3	L4
4	Evaluation of initial and final conditions in RL , RC and RLC circuits.	CO3	L4
5	Numericals	CO3	L4
6	Numericals	CO3	L4
7	Solution of network for step response	CO4	L4
8	Solution of network for ramp and impulse response	CO4	L4
9	Waveform synthesis	CO4	L4
10	Numericals and test		
11			
12			
13			
14			
15			

16			
c		**CO**	**Level**
1	Multistage wide band amplifiers,Power flow algorithms	CO1	L3
2		CO2	L4
d		-	-
1	Refer the circuit shown in fig .Find Vc(0+).Assume that the switch was closed state for a long time	CO1	L1
2	Refer the circuit shown . Find iL(0+) and Vc(0+). The circuit is in steady state with the switch in closed condition.	CO1	L3
3	In the network shown in fig the switch is moved from position 1 to 2 at t=0.The steady state has been reached before switching. Calculate I,di/dt and d2i/dt2 at t = 0+	CO2	L2
4	In the given network , the switch K is opened at t=0.solve for the values of v,dv/dt and d2v/dt2 if I=2A ,R=200Ω and L=1H	CO2	L4
5	In the circuit shown in fig a steady state is reached with switch k open.At t=0, the switch is closed. For element values given determine the values of v0(0-) and v0(0+)	CO2	L2
6	In the network of the fig th switch k is opened at t=0 after the network has attained steady state with the switch closed a) find the expression for vK at t=0+ b) If the parameters are adjusted	CO2	L5
7	Find the laplace transform of x(t) shown in fig	CO2	L2
8	Find the Laplace transform of x(t)=sin(2wot)u(t)	CO2	L3
9	Find the convolution of h(t)=e-t and f(t)=e-2t	CO2	L4
10	Find the initial value of	CO1	L1
11	Verify final value theorem	CO1	L4
e	**Experiences**	-	-
1		CO1	L2
2			
3			
4		CO3	L3
5			

Module – 4

Title:	Divide and Conquer	Appr Time:	16 Hrs
a	***Course Outcomes***	–	**Blooms**
–	The student should be able to:	–	**Level**
1	Evaluate RLC elements in Resonant circuits.	CO7	L2
2		CO8	L3
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	Introduction to concept of resonance		
2	Series resonance		
3	Related derivations		
4	Parallel resonance		
5	Related derivations		
6	q- factor,bandwidth		
7	Numericals		
8	Numericals		
9	Numericals		
10	test		
c		**CO**	**Level**
1	Tuning radio and audio receivers,	CO8	L3
2		CO7	L4
d		–	–
1	Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit.	CO7	L1
2	Obtain the expression for resonant frequency, bandwidth and Q-factor for Series R-L-C circuit	CO7	L3
3	Show that the resonant frequency circuit f r2 =f 1 f 2 where f 1 and f 2 are the half power frequencies and f r is the resonant frequency.	CO8	L2
4	Write the comparison between series resonance and parallel resonance?	CO7	L4
5	In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance?	CO8	L2
6	A series RLC circuit has R=10Ω, L=0.5H and C=40μF. The applied	CO8	L5

	voltage is 100V. Find (a) Resonant frequency & Quality factor of a coil (b) Bandwidth (c) Upper and lower Half power frequencies (d) Current at resonance & current at half power points (e) Voltage across inductance & voltage across capacitance at resonance.		
7	In a parallel resonance circuit (Tank circuit) R=2Ω, L=1mH and C=10μF, Find the Resonant frequency, Dynamic impedance and Bandwidth.		L2
8	Obtain the expression for resonant frequency for parallel RL-RC circuit.		L3
9	In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance?		L4
10	In a two branch RL-RC rallel resonant circuit L=0.4H and c=40Mf. Obtain resonant frequency for the following values of Rl and Rc.		L1
11	A parallel RLC circuit has a quality factor of 100at unity power factor and operates at 1 khz and dissipates 1 warr when driven by 1A at 1khz . Find bandwidth , R,L,C.		L4
e	**Experiences**	-	-
1		CO7	L2
2			
3			
4		CO8	L3
5			

E2. CIA EXAM – 2

a. Model Question Paper – 2

Crs Code:	CS501PC	Sem:	I	Marks:	30	Time:	75 minutes
Course:	Design and Analysis of Algorithms						

-	-	**Note: Answer any 2 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1	a	In the given network , the switch K is opened at t=0.solve for the values of v,dv/dt and d2v/dt2 if I=2A ,R=200Ω and L=1H	20	CO5	L1
	b	In the circuit shown in fig a steady state is reached with switch k open.At t=0, the switch is closed. For element values given determine the values of v0(0-) and v0(0+)			L2
				CO6	L3
					L1

2	a	Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit.	20	CO7	L2
	b	A parallel RLC circuit has a quality factor of 100at unity power factor and operates at 1 khz and dissipates 1 warr when driven by 1A at 1khz . Find bandwidth , R,L,C.			L4
	c				L3
	d				L2
3	a	Refer the circuit shown in fig .Find Vc(0+).Assume that the switch was closed state for a long time	20	CO8	L1
	b	Refer the circuit shown . Find iL(0+) and Vc(0+). The circuit is in steady state with the switch in closed condition.		CO8	L2
	c				L1
	d				L2
4	a	A series RLC circuit has R=10Ω, L=0.5H and C=40μF. The applied voltage is 100V. Find (a) Resonant frequency & Quality factor of a coil (b) Bandwidth (c) Upper and lower Half power frequencies (d) Current at resonance & current at half power points (e) Voltage across inductance & voltage across capacitance at resonance.	20		L2
	b	In a parallel resonance circuit (Tank circuit) R=2Ω, L=1mH and C=10μF, Find the Resonant frequency, Dynamic impedance and Bandwidth.			L2
	c				L1
	d				L3

b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	CS501PC	Sem:	I	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	Design and Analysis of Algorithms						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1	1KT18EC001	Refer the circuit shown in fig .Find Vc(0+).Assume that the switch was closed state for a long time	5	CO8	L2

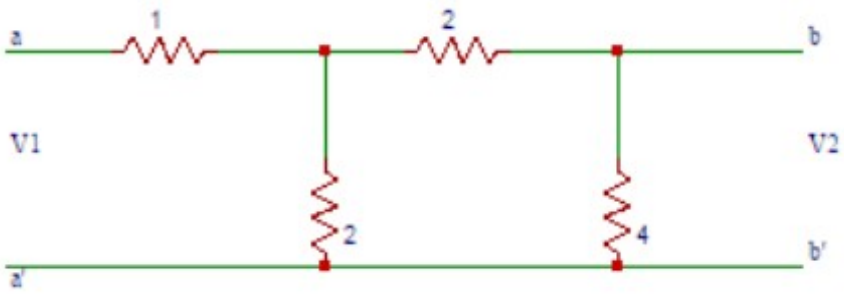
2	1KT18EC003	Refer the circuit shown . Find iL(0+) and Vc(0+). The circuit is in steady state with the switch in closed condition.	5	CO9	L3
3	1KT18EC005	In the network shown in fig the switch is moved from position 1 to 2 at t=0.The steady state has been reached before switching. Calculate I,di/dt and d2i/dt2 at t = 0+		CO10	L4
4	1KT18EC008	In the given network , the switch K is opened at t=0.solve for the values of v,dv/dt and d2v/dt2 if I=2A ,R=200Ω and L=1H	5	CO9	L3
5	1KT18EC009	In the circuit shown in fig a steady state is reached with switch k open.At t=0, the switch is closed. For element values given determine the values of v0(0-) and v0(0+)			
6	1KT18EC010	In the network of the fig th switch k is opened at t=0 after the network has attained steady state with the switch closed a) find the expression for vK at t=0+ b) If the parameters are adjusted			
7	1KT18EC011	Find the laplace transform of x(t) shown in fig			
8	1KT18EC012	Find the Laplace transform of x(t)=sin(2wot)u(t)			
9	1KT18EC013	Find the convolution of h(t)=e-t and f(t)=e-2t			
10	1KT18EC014	Find the initial value of			
11	1KT18EC015	Verify final value theorem			
12	1KT18EC016	Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit.			
13	1KT18EC017	Obtain the expression for resonant frequency, bandwidth and Q-factor for Series R-L-C circuit			
14	1KT18EC018	Show that the resonant frequency circuit f r2 =f 1 f 2 where f 1 and f 2 are the half power frequencies and f r is the resonant frequency.			
15	1KT18EC019	Write the comparison between series resonance and parallel resonance?			
16	1KT18EC020	In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance?			

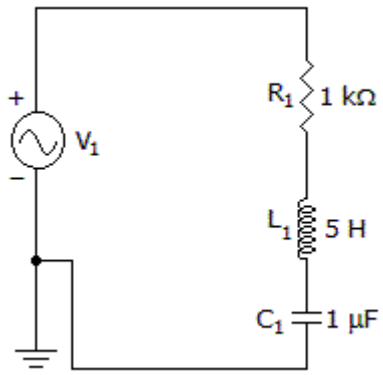
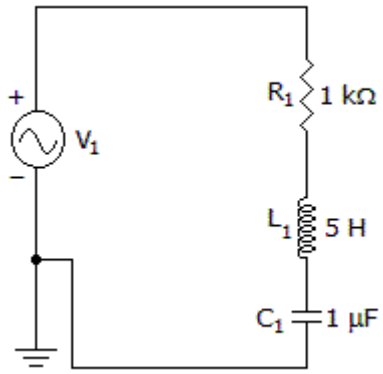
17	1KT18EC021	A series RLC circuit has R=10Ω, L=0.5H and C=40μF. The applied voltage is 100V. Find (a) Resonant frequency & Quality factor of a coil (b) Bandwidth (c) Upper and lower Half power frequencies (d) Current at resonance & current at half power points (e) Voltage across inductance & voltage across capacitance at resonance.			
18	1KT17EC001	In a parallel resonance circuit (Tank circuit) R=2Ω, L=1mH and C=10μF, Find the Resonant frequency, Dynamic impedance and Bandwidth.			
19	DIP	Obtain the expression for resonant frequency for parallel RL-RC circuit.			
20	1KT16EC030	In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance?			
21	DIP	In a two branch RL-RC rallel resonant circuit L=0.4H and c=40Mf. Obtain resonant frequency for the following values of Rl and Rc.			
22	DIP	A parallel RLC circuit has a quality factor of 100at unity power factor and operates at 1 khz and dissipates 1 watt when driven by 1A at 1khz . Find bandwidth , R,L,C.			
23	DIP	A parallel RLC circuit has a quality factor of 100at unity power factor and operates at 1 khz and dissipates 1 watt when driven by 1A at 1khz . Find bandwidth , R,L,C.			

D3. TEACHING PLAN - 3

Module - 5

Title:	Divide and Conquer	Appr Time:	16 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Evaluate time and space complexity and calculate performance	CO9	L2
2	Understand searching and sorting schemes	CO10	L3
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	Two port network parameters:		
2	Definition of Z parameters,		
3	Definition of Y parameters		

4	Definition of h parameters		
5	Transmission parameters,		
6	Modelling with these parameters, r		
7	Relationship between Z and Y parameters		
8	Relationship between Z and h parameters		
9	Relationship between Z and Transmission parameters		
10	Relationship between h and Transmission parameters		
c	**Application Areas**	**CO**	**Level**
1	Use to find performance of algorithm	CO10	L3
2	Used in Searching and sorting	CO9	L4
d	**Review Questions**	-	-
1	Define ABCD Parameters. Express relation between y and ABCD p[arameters	CO10	L1
2	Obtain hybrid parameters in terms of Z parameters	CO10	L3
3	Find the Z – parameter Z_{11} in the circuit shown below. 	CO9	L2
4	Find the Y parameters of the Circuit shown above	CO9	L4
5	Find the Transmission Parameters of the Circuit shown above		L2
6	Find the Hybrid parameters of the circuit shown above		L5
7	Obtain h parameters in terms of Z Parameters		L2
8	Obtain h parameters in terms of Y Parameters		L3
9	Obtain h parameters in terms of transmission Parameters		L4
10	What is the quality factor for the following circuit?		L1

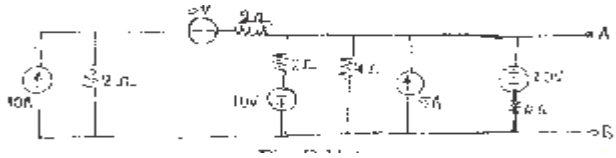
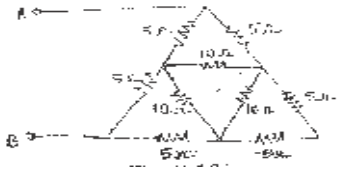
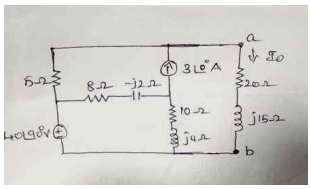
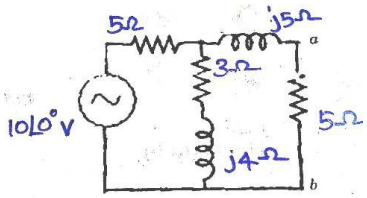
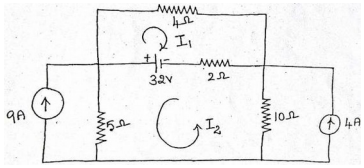
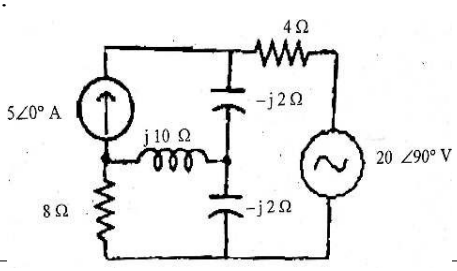
			
11	What is the bandwidth of the following circuit? 		L4
e	**Experiences**	–	–
1		CO10	L2
2			
3			
4		CO9	L3
5			

E3. CIA EXAM – 3

a. Model Question Paper – 3

Crs Code:	CS501PC	Sem:	I	Marks:	30	Time:	75 minutes
Course:	Design and Analysis of Algorithms						

-	-	**Note: Answer any 2 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1	a	List the differences between linear and nonlinear circuits,Active and passive elements.	20	CO9	L1
	b	Derive the expression for star to delta and delta to star transformations.			L2

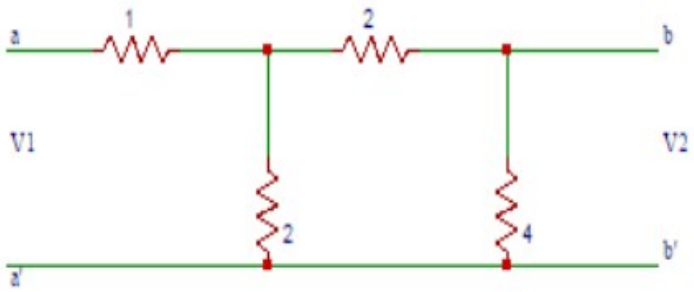
	c	Convert the network into single wotlage source using source transformations 		CO9	L3
	d	Draw the equivalent resistance at terminlas a and b in the networks. 			L1
2	a	Apply Norton theorem to determine current I_0 for the given circuit in fig. 	20	CO10	L2
	b	What is the condition for maximum power transfer to the load?			L4
	c	Find the current through the branch a-b of the network shown in fig using Thevenin's theorem. 			L3
	d	Estimate the current through 5 Ω resistor using superposition theorem, in the circuit shown in fig.  Use the superposition theorem to find the current through 4Ω resistor in the circuit shown in fig. 			L2

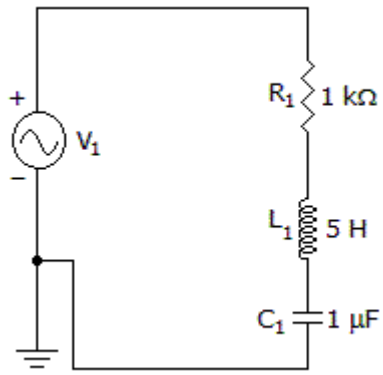
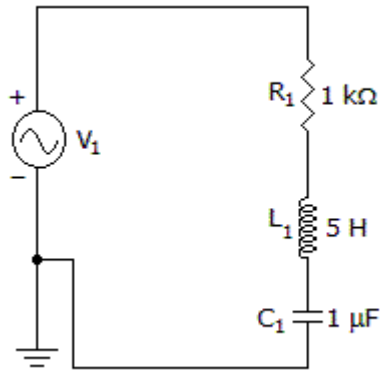
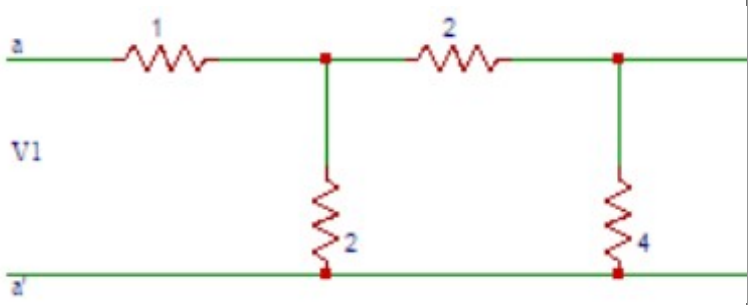
3	a		20	CO10	L1
	b			CO10	L2
	c				L1
	d				L2
4	a		20		L2
	b				L2
	c				L1
	d				L3

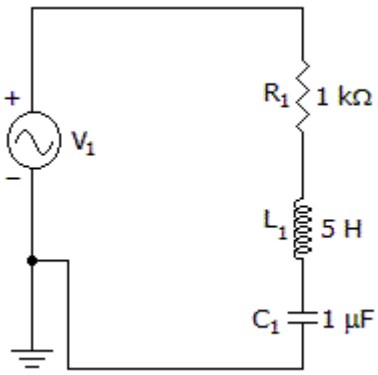
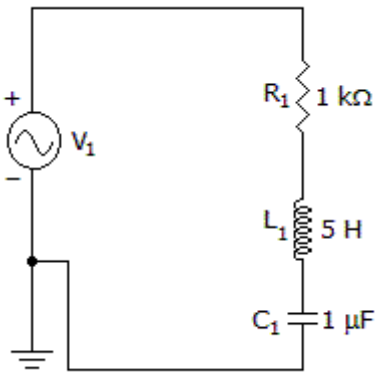
b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	CS501PC	Sem:	I	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	Design and Analysis of Algorithms						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

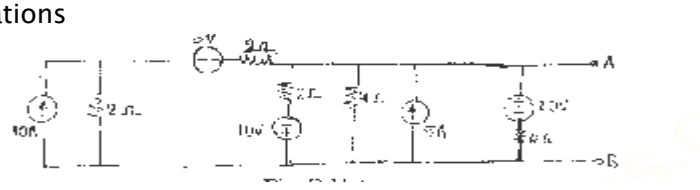
SNo	USN	Assignment Description	Marks	CO	Level
1	1KT18EC001	Define ABCD Parameters. Express relation between y and ABCD p[arameters	5	CO9	L2
2	1KT18EC003	Obtain hybrid parameters in terms of Z parameters	5	CO9	L3
3	1KT18EC005	Find the Z – parameter Z_{11} in the circuit shown below. 		CO10	L4
4	1KT18EC008	Find the Y parameters of the Circuit shown above	5	CO10	L3
5	1KT18EC009	Find the Transmission Parameters of the Circuit shown above			
6	1KT18EC010	Find the Hybrid parameters of the circuit shown above			
7	1KT18EC011	Obtain h parameters in terms of Z Parameters			
8	1KT18EC012	Obtain h parameters in terms of Y Parameters			
9	1KT18EC013	Obtain h parameters in terms of transmission Parameters			
10	1KT18EC014	What is the quality factor for the following circuit?			

					
11	1KT18EC015	What is the bandwidth of the following circuit? 			
12	1KT18EC016	Define ABCD Parameters. Express relation between y and ABCD p[arameters			
13	1KT18EC017	Obtain hybrid parameters in terms of Z parameters			
14	1KT18EC018	Find the Z – parameter Z_{11} in the circuit shown below. 			
15	1KT18EC019	Find the Y parameters of the Circuit shown above			
16	1KT18EC020	Find the Transmission Parameters of the Circuit shown above			
17	1KT18EC021	Find the Hybrid parameters of the circuit shown above			
18	1KT17EC001	Obtain h parameters in terms of Z Parameters			
19	DIP	Obtain h parameters in terms of Y Parameters			
20	1KT16EC030	Obtain h parameters in terms of transmission Parameters			

21	DIP	What is the quality factor for the following circuit? 			
22	DIP	What is the bandwidth of the following circuit? 			
23	DIP	Obtain h parameters in terms of Z Parameters			

F. EXAM PREPARATION

1. University Model Question Paper

Course:		Design and Analysis of Algorithms					Month / Year	May /2018	
Crs Code:		CS501PC	Sem:	I	Marks:	100	Time:	180 minutes	
–	**Note**	Answer all FIVE full questions. All questions carry equal marks.					**Marks**	**CO**	**Level**
1	a	List the differences between linear and nonlinear circuits,Active and passive elements.					16 / 20	CO1	
	b	Derive the expression for star to delta and delta to star transformations.							
	c	Convert the network into single wotlage source using source transformations 						CO2	

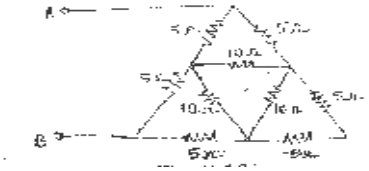
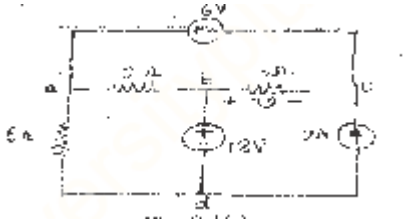
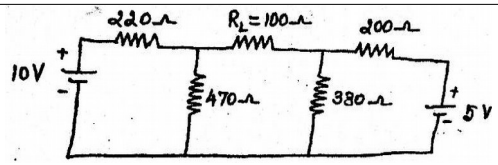
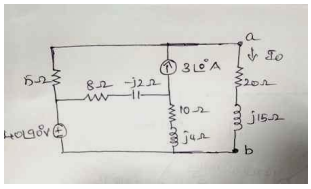
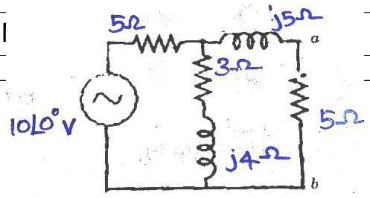
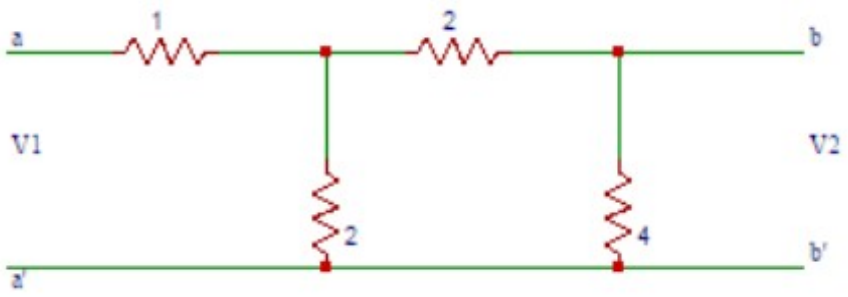
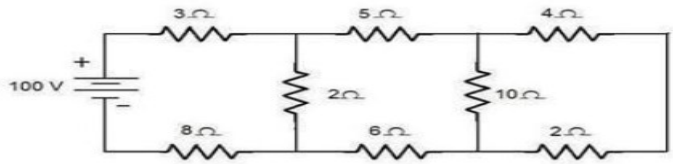
	d				
		OR			
–	a	Draw the equivalent resistance at terminlas a and b in the networks. 	16 / 20	CO1	
	b	Find voltage v across 3ohms using nodal analysis 		CO2	
	c	Using source transformation find the power deliverd to the load by 50v source. 			
2	a	Explain the concept of source transformation?	16 / 20	C03	
	b	State and explain Kirchhoff's laws?			
	c			CO4	
		OR			
–	a	Apply Norton theorem to determine current I_0 for the given circuit in fig. 	16 / 20	CO3	
	b	What is the condition for maximum power transfer to the load?		CO4	
	c	Find the current through the branch a-b of the network shown in			

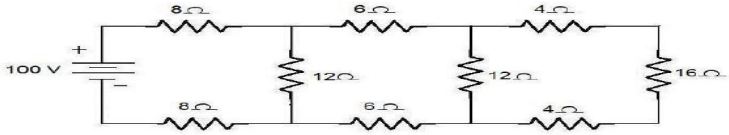
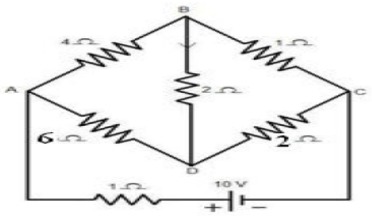
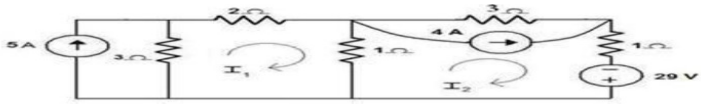
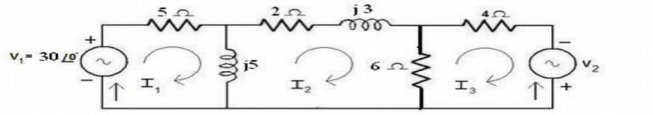
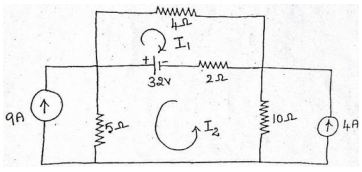
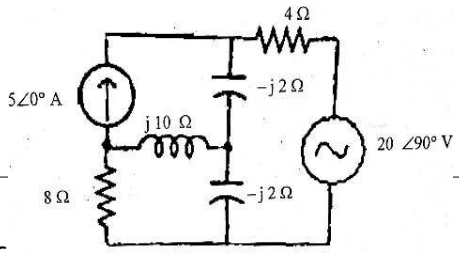
		fig using Thevenin's theorem. 			
3	a	Refer the circuit shown in fig .Find Vc(0+).Assume that the switch was closed state for a long time	16 / 20	CO5	
	b	Refer the circuit shown . Find iL(0+) and Vc(0+). The circuit is in steady state with the switch in closed condition.			
	c	In the network shown in fig the switch is moved from position 1 to 2 at t=0.The steady state has been reached before switching. Calculate I,di/dt and d2i/dt2 at t = 0+		CO6	
		OR			
	a	In the given network , the switch K is opened at t=0.solve for the values of v,dv/dt and d2v/dt2 if I=2A ,R=200Ω and L=1H			
-	b	In the circuit shown in fig a steady state is reached with switch k open.At t=0, the switch is closed. For element values given determine the values of v0(0-) and v0(0+)	16 / 20	CO5	
	c	In the network of the fig th switch k is opened at t=0 after the network has attained steady state with the switch closed a) find the expression for vK at t=0+ b) If the parameters are adjusted			
	c	Explain the terms P, NP, NP-Hard and NP-Complete with suitable example. Also give relationship between them.		CO6	
4	a	Define ABCD Parameters. Express relation between y and ABCD p[arameters	16 / 20	CO7	
	b	Obtain hybrid parameters in terms of Z parameters			
	c	Find the Z – parameter Z_{11} in the circuit shown below. 		CO8	

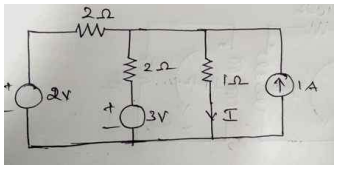
		OR			
	a	Find the Y parameters of the Circuit shown above			
	b	Find the Transmission Parameters of the Circuit shown above			
–	c	Find the Hybrid parameters of the circuit shown above	16 / 20	CO7	
5	a	Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit.	16 / 20	CO9	
	b	Obtain the expression for resonant frequency, bandwidth and Q-factor for Series R-L-C circuit		CO10	
	c	Show that the resonant frequency circuit f r2 =f 1 f 2 where f 1 and f 2 are the half power frequencies and f r is the resonant frequency.			
		OR			
	a	Write the comparison between series resonance and parallel resonance?			
	b	In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance?			
	c	A series RLC circuit has R=10Ω, L=0.5H and C=40μF. The applied voltage is 100V. Find (a) Resonant frequency & Quality factor of a coil (b) Bandwidth (c) Upper and lower Half power frequencies (d) Current at resonance & current at half power points (e) Voltage across inductance & voltage across capacitance at resonance.	16 / 20	CO9	

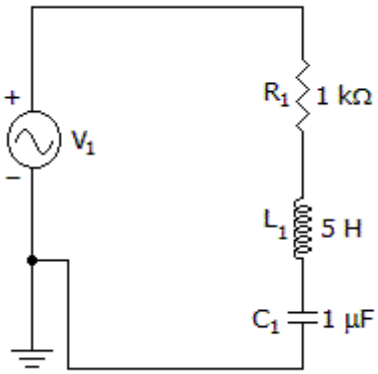
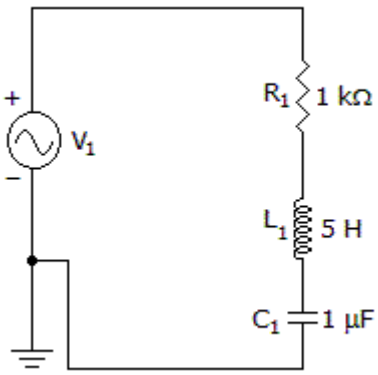
2. SEE Important Questions

Course:	Design and Analysis of Algorithms					Month / Year	May /2018
Crs Code:	CS501PC	Sem:	3	Marks:	100	Time:	180 minutes

	Note	Answer all FIVE full questions. All questions carry equal marks.	–	–	
Module	Qno.	Important Question	**Marks**	**CO**	**Year**
1	1	Find the current through each branch by network reduction technique. 	16 / 20		2004

	2	Calculate a) the equivalent resistances across the terminals of the supply, b) total current supplied by the source and c) power delivered to 16 ohm resistor in the circuit shown in figure 			2004
	3	In the circuit shown, determine the current through the 2 ohm resistor and the total current delivered by the battery. Use Kirchhoff's laws. 			2004
	4	Determine the mesh currents I1 and I2 for the given circuit shown below 			2007
	5	Determine the value of V2 such that the current through the impedance (2+j3) ohm is zero. 			2007
2	1	Estimate the current through 5 Ω resistor using superposition theorem, in the circuit shown in fig.  Use the superposition theorem to find the current through 4Ω resistor in the circuit shown in fig. 	16 / 20		2005

	2	State and explain Superposition theorem?			2005
	3	State and explain maximum power transfer theorem/			2009
	4	State and explain milliman's theorem.			2006
	5	Find Norton's equivalent for the following circuit. 			2004
3	1	In the circuit shown in fig a steady state is reached with switch k open.At t=0, the switch is closed. For element values given determine the values of v0(0-) and v0(0+)	16 / 20		2006
	2	In the network of the fig th switch k is opened at t=0 after the network has attained steady state with the switch closed a) find the expression for vK at t=0+ b) If the parameters are adjusted			2006
	3	Find the laplace transform of x(t) shown in fig			2007
	4	Find the Laplace transform of x(t)=sin(2wot)u(t)			2004
	5	Find the convolution of h(t)=e-t and f(t)=e-2t			2004
4	1	Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit.	16 / 20		2004
	2	A parallel RLC circuit has a quality factor of 100at unity power factor and operates at 1 khz and dissipates 1 warr when driven by 1A at 1khz . Find bandwidth , R,L,C.			2004
	3	Show that the resonant frequency circuit f r2 =f 1 f 2 where f 1 and f 2 are the half power frequencies and f r is the resonant frequency.			2006
	4	Write the comparison between series resonance and parallel resonance?			2004
	5	In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance?			2007
		A series RLC circuit has R=10Ω, L=0.5H and C=40μF. The applied voltage is 100V. Find (a) Resonant frequency & Quality factor of a coil (b) Bandwidth			

		(c) Upper and lower Half power frequencies (d) Current at resonance & current at half power points (e) Voltage across inductance & voltage across capacitance at resonance.			
5	1	Obtain h parameters in terms of Z Parameters			
	2	Obtain h parameters in terms of Y Parameters			
	3	Obtain h parameters in terms of transmission Parameters			
	4	What is the quality factor for the following circuit? 			
	5	What is the bandwidth of the following circuit? 			

G. Content to Course Outcomes

1. TLPA Parameters

Table 1: TLPA – Example Course

Module-#	Course Content or Syllabus (Split module content into 2 parts which have similar concepts)	Content Teaching Hours	Blooms' Learning Levels for Content	Final Bloom's' Level	Identified Action Verbs for Learning	Instruction Methods for Learning	Assessment Methods to Measure Learning
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*
1	Practical sources,source transformation,network reduction using star-delta transformations,loop and node analysis with linearly dependent and independent sources for DC and AC networks,concepts of super node and super mesh	13	L4	L4	-Understand -Explore	Lecture	Slip test
2	Superposition,Reciprocity, Millman's theorems, Thevini's and Norton's Theorems ,Maximum power transfer theorem	15	L4	L4	-Identify -	Explanation	Q & A
3	Behavior of circuit elements under switching condition and their representation,evaluation of initial and final conditions in RL,RC and RLC circuits for AC and DC excitations Solutions of networks ,step,ramp and impulse response, waveform synthesis	10	L4	L4	-Interpret -	Description	Q & A
4	Series and parallel resonance, frequency response of series and parallel circuits , q-factor ,bandwidth	10	L3	L3	-Compare -	Explanation	Q & A
5	Definition of Z,Y,h and Transmission parameters, modeling with these parameters,relationship between parameters sets	12	l4	l4	-Illustrate -	Examine	Focused on analyzing / compare

2. Concepts and Outcomes:

Table 2: Concept to Outcome – Example Course

Module-#	Learning or Outcome from study of the Content or Syllabus	Identified Concepts from Content	Final Concept	Concept Justification (What all Learning Happened from the study of Content / Syllabus. A short word for learning or outcome)	CO Components (1.Action Verb, 2.Knowledge, 3.Condition / Methodology, 4.Benchmark)	Course Outcome **Student Should be able to ...**
A	*I*	*J*	*K*	*L*	*M*	*N*
1	Reduce the circuit complexity and apply Kirchhoff's laws to solve the network.	Transformation loop and node analysis	Network Reduction	Analog to digital conversion by sampling.	1)Understand 2)analog signal reconstruction 3)from the samples 4)at Nyquist rate	Reduce the circuit complexity and apply Kirchhoff's laws to solve the network.
2	Solve network problems by using principle of theorems	Network Theorems	Network Reduction using theorems	Analog to digital conversion by sampling.	1)Understand 2)DFT behavior 3)with input 4) of Variable condition	Solve network problems by using principle of theorems
3	Calculate current and voltages of a network to understand switching analysis of networks by solving integro-diffrential equations	Circuit switching	Circuit conditions before ad after swithing	Behavior of DFT with inputs.	1)Understand 2)DFT behavior 3)with input 4) of Variable condition	Calculate current and voltages of a network to understand switching analysis of networks by solving integro-diffrential equations
4	Apply Laplace transform to solve network problems	S-domain analysis	Solution to complex problems using LT	Behavior of DFT with inputs.	1) Compare 2) DFT with 3) FFT 4)wrt efficient Computation	Apply Laplace transform to solve network problems
5	Evaluate RLC elements in	Resonance	Resonance	Computationally efficient radix 2	1)Develop 2) DFT	Evaluate RLC elements in

	Resonant circuits.			algorithm to compute DFT.	computation 3)using DITalgorithm 4)for a given input length	Resonant circuits.
5	Apply two port network parameters to solve given network.	Network Modeling	Network model	Computationally efficient radix 2 algorithm to compute DFT.	1)Develop 2) DFT computation 3)using DIF algorithm 4)for a given input length	Apply two port network parameters to solve given network.