



**Course File**  
**For**  
**Session (2019-20)**

<b>Name of faculty</b>	Raj Kumar Jain
<b>Designation</b>	Assit. Prof.
<b>Department</b>	ECE
<b>Subject taught</b>	Network Theory (3EC4-06)
<b>Class</b>	ECE III Sem Section A

**Prepared By:**  
**Raj Kumar Jain**  
(Assit. Professor, Dept. of ECE, JECRC)

**Approved By**

**Dr. Sandeep Vyas**  
Program Coordinator-ECE

**Dr. V.K. Chandana**  
Principal-JECRC

### **Vision of Institute**

To become a renowned center of outcome based learning, and work towards academic, professional, cultural and social enrichment of the lives of individuals and communities.

### **Mission of Institute**

- M1.** Focus on evaluation of learning outcomes and motivate students to inculcate research aptitude by project based learning.
- M2.** Identify, based on informed perception of Indian, regional and global needs, areas of focus and provide platform to gain knowledge and solutions.
- M3.** Offer opportunities for interaction between academia and industry.
- M4.** Develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in a range of professions.

### **Vision of Department**

To contribute to the society through excellence in scientific and technical education, teaching and research aptitude in Electronics & Communication Engineering to meet the needs of Global Industry.

### **Mission of Department**

- M1.** To equip the students with strong foundation of basic sciences and domain knowledge of Electronics & Communication Engineering, so that they are able to creatively apply their knowledge to design solution of problems arising in their career path.
- M2.** To induce the habits of lifelong learning in order to continuously enhance overall performance.
- M3.** Students are able to communicate their ideas clearly and concisely so that they can work in team as well as an individual.
- M4.** To make the students responsive towards the ethical, social, environmental and economical growth of the society.

### **Program Educational Objectives (PEO's)**

- PEO1.** To provide students with the fundamentals of engineering sciences with more emphasis in Electronics & Communication Engineering by way of analyzing and exploiting electronics & communication challenges.
- PEO2.** To train students with good scientific and Electronics & Communication Engineering knowledge so as to comprehend, analyze, design and create electronics & communication based novel products and solutions for the real life problems.
- PEO3.** To inculcate professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, entrepreneurial thinking and an ability to relate Electronics & Communication Engineering with social issues.
- PEO4.** To provide students with an academic environment aware of excellence, leadership, written ethical codes and guidelines, and the self-motivated life-long learning needed for a successful Electronics & Communication Engineering professional career.
- PEO5.** To prepare students to excel in electronics & communication based industry and higher education by educating students in Electronics & Communication Engineering field along with high moral values and knowledge.

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**JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE**

**Department of Electronics & Communication Engg.**

**COURSE : B.Tech**

**SEMESTER**

**SECTION :A,B,C**

**SUBJEC :NT**

**CODE :3EC4-06**

**TIME:1:00 Hr**

**Unit Test -1**

**MM: 10**

**COURSE OUTCOMES**

CO1: Apply the basic circuit law and simplify the network using network theorems.

CO2: Appreciate the frequency domain techniques in different applications.

CO3: Apply Laplace Transform for steady state and transient analysis.

CO4: Evaluate transient response and two-port network parameters.

CO5: Analyze the series resonant and parallel resonant circuit and design filters.

**Instructions: Attempt all sections**

Q1 CO1 What is KVL? (1)

Q2CO1 the nodal method of circuit analysis is based on (1)

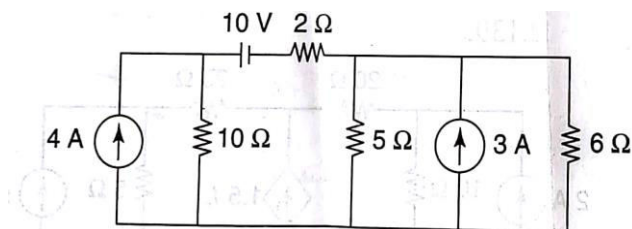
(a)KVL and Ohm's law (b) KCL and Ohm's law (c) Both

Q3 CO1 Write Ohms Law? (1)

Q4CO1 Capacitor is active element (1)

(a) True (b) False

Q5 CO1 Find the current in  $6\Omega$  using KCL. (3)

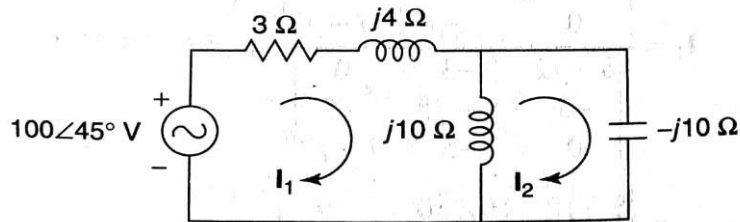


OR

Q5 CO1

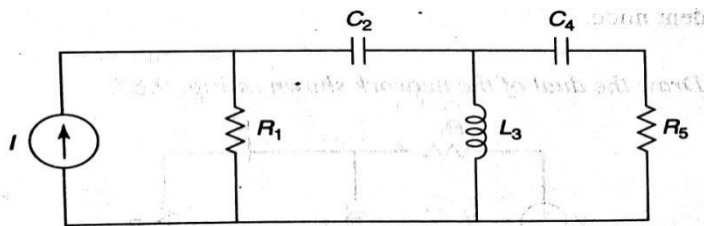
Find the value of current  $I$  using KVL

(3)



Q6 CO1 Find the dual of following circuit.

(3)



OR

Q6 CO1 Explain concept of duality in network theory

(3)

**JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE**

Department of Electronics & Communication Engg.

COURSE : B.Tech

SEMISTER

SECTION: A

SUBJECT: NT

CODE : 3EC4-06

TIME: 1:00 Hr

Unit Test -2

MM: 10

**COURSE OUTCOMES**

CO1: Apply the basic circuital law and simplify the network using network theorems.

CO2: Appreciate the frequency domain techniques in different applications.

CO3: Apply Laplace Transform for steady state and transient analysis.

CO4: Evaluate transient response and two-port network parameters.

CO5: Analyze the series resonant and parallel resonant circuit and design filters.

**Instructions: Attempt all sections**

Q1 CO1 Superposition theorem is not applicable to networks containing nonlinear element. (1)

(b) True                      (b) False

Q2CO1 For transfer of maximum power the value of load resistance should be equal to .....? (1)

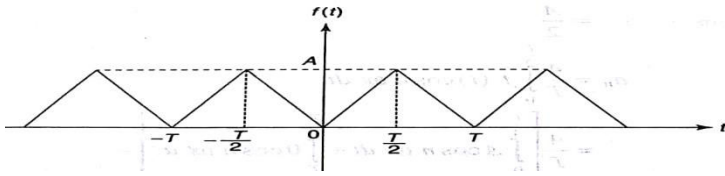
Q3 CO1 Passive element has self-energy. (1)

(a) True                      (b) False

Q4CO1 In a bilateral element current can flow in both direction. (1)

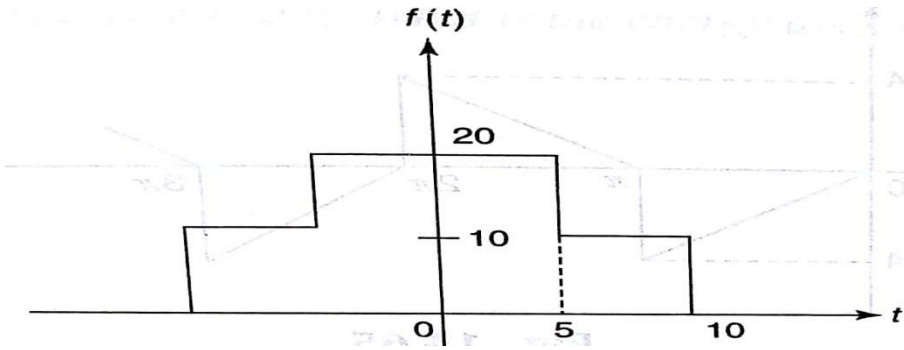
(b) True                      (b) False

Q5 CO2 Find the trigonometric Fourier series for given waveform and also draw line spectrum. (3)



Q 6CO2 Find the Fourier transform of given waveform.

(3)



JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE

Department of Electronics & Communication Engg.

(Session:2019-2020)

COURSE : B.Tech

SEMESTER:-III

SECTION :A,B,C

SUBJECT : Network Theory

CODE : 3EC4-06

TIME: 1:00 Hr

Unit Test -3

MM: 10

CO1: Apply the basic circuital law and simplify the network using network theorems.

CO2: Appreciate the frequency domain techniques in different applications.

CO3: Apply Laplace Transform for steady state and transient analysis.

CO4: Evaluate transient response and two-port network parameters.

CO5: Analyze the series resonant and parallel resonant circuit and design filters.

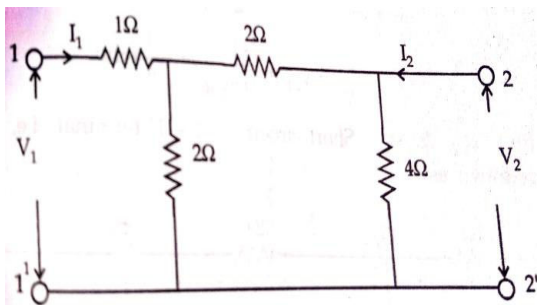
CO1 Q1. Explain the Maximum power Transfer Theorem. (1)

CO1 Q2.What is KVL & KCL (1)

CO2 Q3 Write down different symmetry in Fourier series. (2)

CO4 Q4. Expalin Series connection of two port network. (3)

CO5 Q5. Find the  $y$ - parameter for the network (3)



JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE

Department of Electronics & Communication Engg.

COURSE : B.Tech

SEMISTER

SECTION: A,B,C

SUBJECT: NT

CODE : 3EC4-06

TIME: 1:00 Hr

Unit Test -4

MM: 10

COURSE OUTCOMES

CO1: Apply the basic circuit law and simplify the network using network theorems.

CO2: Appreciate the frequency domain techniques in different applications.

CO3: Apply Laplace Transform for steady state and transient analysis.

CO4: Evaluate transient response and two-port network parameters.

CO5: Analyze the series resonant and parallel resonant circuit and design filters.

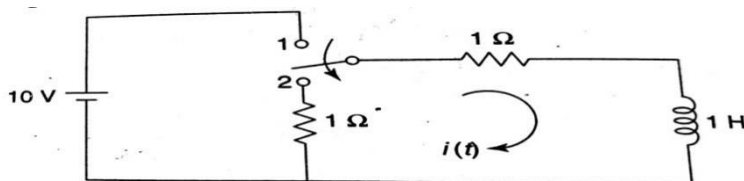
Instructions: Attempt all sections

Q1.CO1 State Super position theorem. (2)

Q2.CO2 Explain trigonometric Fourier series. (2)

Q3.CO4 Give ABCD parameter in term of Y parameter.. (2)

Q4.CO3 Initially switches at position 1 and steady state established. At  $t = 0$  it is moved to position 2. Determine  $i(t)$  for  $t > 0$ . (3)



Q5.CO3 Find Impulse response of a Series RL circuit. (3)

**JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE**

**Department of Electronics & Communication Engg.**

**(Session:2019-2020)**

COURSE : B.Tech

SEMESTER:-III

SECTION :A,B,C

SUBJECT : Network theory

CODE : 3EC4-06

TIME: 3:00 Hr

Full Syllabus Test

MM: 160

*Course Outcomes:*

**CO1: Apply the basic circuital law and simplify the network using network theorems**

**CO2: Appreciate the frequency domain techniques in different applications**

**CO3: Apply Laplace Transform for steady state and transient analysis**

**CO4: Evaluate transient response and two-port network parameters**

**CO5: Analyze the series resonant and parallel resonant circuit and design filters**

*Instructions to candidates:*

Attempt all 10 questions from Part A, five questions out of seven questions from Part B and four questions out of five questions from Part C.

If you feel any data is missing then assume it and mention it clearly.

**PART – A**

(Answers should be given upto 25 words only)

[10x3=30]

(All questions are compulsory)

Q1 CO1: State maximum power transfer theorem.

Q2 CO1:	State KVL and KCL.	
Q3 CO2:	Write down different symmetry in Fourier series.	
Q4 CO2:	Explain exponential fourier series.	
Q5 CO3:	Write initial and final value theorem.	
Q6 CO3:	Explain Steady state behaviour of capacitor and inductor.	
Q7 CO4:	Define h parameter.	
Q8 CO4:	What are poles and zeros.	
Q9 CO5:	Define power factor.	
Q10CO5 :	Define Q factor for series resonant circuit.	
<b>PART – B</b>		
(Attempt any five questions)		[5X10=50]
Q1 CO1:	Explain the concept of duality, use mess analysis to find current in 5 ohm in the network shown in given figure.(3+7)	
	(3+7)	
Q2 CO1:	State superposition theorem. Using the principal of superposition find current in 10ohm Resister in the given circuit.	
	(3+7)	

Q3 CO2: Find the fourier series for the given waveform and also plot its line spectrum.  
(7+3)

Q4 CO3: A dc voltage of 100V is applied in the circuit and the switch K is open. The switch K is closed at t=0. Find the complete expression for the current.

Q5 CO4: Give H parameter in term of Y paramater.

Q6 CO5: Explain the term filter and design a low pass filter(T and π section) having cut off frequency of 4KHZ and  $R_0 = 500 \Omega$ .

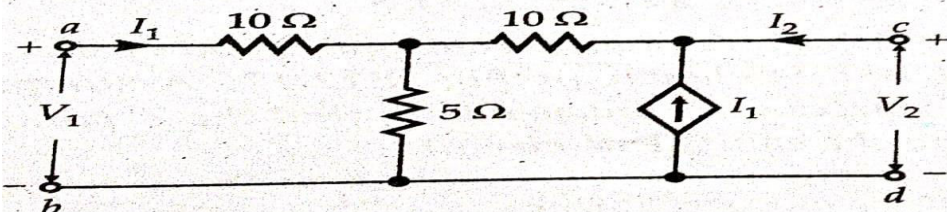
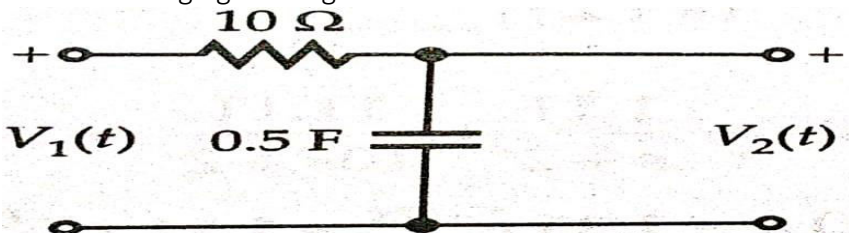
**PART – C**

(Attempt any four questions) [4X20=80]

Q1 CO1: (a) State maximum power transfer theorem  
(b) For the given network find  $1\Omega$  using thevenin's and verify result using norton.

(4+16)

Q2 CO2: (a) Derived relation between line voltage and phase voltage for star connection.  
(b) Find the fourier transform for given waveform. (4+16)

Q3 CO3:	(a) Find unit step response of a Series RL circuit. (b) Explain Initial value and final value theorem. <span style="float: right;">(10+10)</span>
Q4 CO4:	(a) Explain cascade connection of two port network. (b) For the given two port network find Z parameter. <div style="text-align: center; margin: 10px 0;">  </div> 2) <span style="float: right;">(8+1)</span>
Q5 CO5:	(a) Explain the term resonance, Find Q factor for series resonant circuit. (b) Find the voltage gain for given circuit. <div style="text-align: center; margin: 10px 0;">  </div> (10+10)

NT Solution (DT-1)

Q.1 In a loop the algebraic sum of voltage is always equal to zero. (1)

Q.2 (b) Kcl and Ohm's law (1)

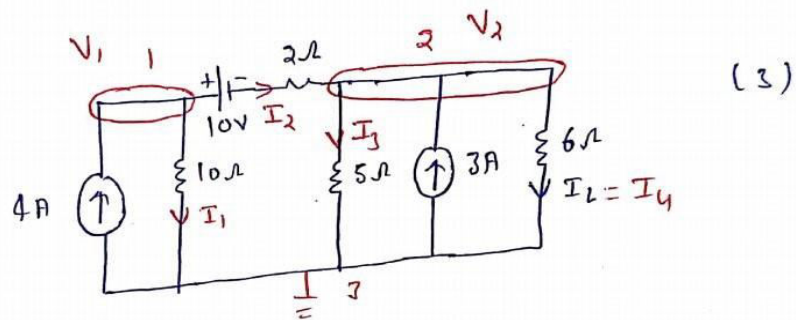
Q.3  $I \propto V$  (i)

$$I = \frac{V}{G}$$

$$\text{or } V = \frac{I}{G} = IR$$

Q.4 (b) False (1)

Q.5



Kcl at Node-1

$$4 = I_1 + I_2$$

$$4 = \frac{V_1 - 0}{10} + \frac{V_1 - 10 - V_2}{2}$$

$$4 = \frac{V_1 + 5V_1 - 50 - 5V_2}{10}$$

$$40 = 6V_1 - 50 - 5V_2$$

$$6V_1 - 5V_2 = 90 \dots (i)$$

(1 marks)

Now KCL at Node-2

$$I_2 + 3 = I_3 + I_4$$

$$\frac{V_1 - 10 - V_2}{2} + 3 = \frac{V_2 - 0}{5} + \frac{V_2 - 0}{6}$$

$$\frac{V_1 - V_2 + 6}{2} = \frac{6V_2 + 5V_2}{30}$$

$$\Rightarrow V_1 - V_2 + 6 = \frac{6V_2 + 5V_2}{15}$$

$$\Rightarrow 15V_1 - 15V_2 + 90 = 11V_2$$

$$\Rightarrow 15V_1 - 26V_2 = -90 \text{ --- (ii)}$$

1 marks

$$15(i) - 6(ii)$$

$$90V_1 - 75V_2 = 1350$$

$$90V_1 - 156V_2 = -540$$

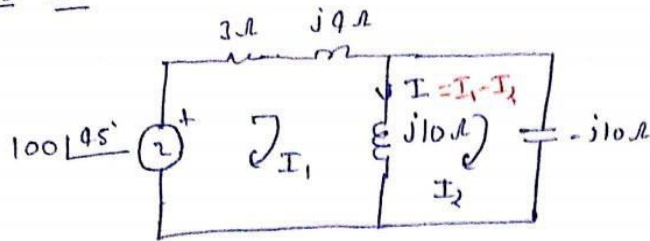
$$\begin{array}{r} - \quad + \quad + \\ \hline 81V_2 = 1890 \end{array}$$

$$V_2 = \frac{1890}{81} = \frac{70}{3} \text{ Volt}$$

$$\text{So } I_4 = I_2 = \frac{V_2 - 0}{6} = \frac{70}{3 \times 6} = \frac{35}{9} \text{ A} \quad 1 \text{ marks}$$

Q.5 Col

3



Sol: Apply kvl at loop-1

$$100 \angle 45^\circ = 3I_1 + 4jI_1 + 10jI_1 - 10jI_2$$

$$100 \angle 45^\circ = I_1 [3 + 14j] - 10jI_2 \quad \text{--- (i)}$$

1 marks

Now kvl at loop-2

$$+j10I_2 + 10j[I_1 - I_2] = 0$$

$$10jI_2 + 10jI_1 - 10jI_2 = 0$$

$$10jI_1 = 0 \quad \text{--- (ii)}$$

1 marks

Use  $I_1$  in eq (i)

$$100 \angle 45^\circ = -10jI_2$$

$$I_2 = \frac{100 \angle 45^\circ}{-10j} = \frac{100 \angle 45^\circ}{10 \angle -90^\circ}$$

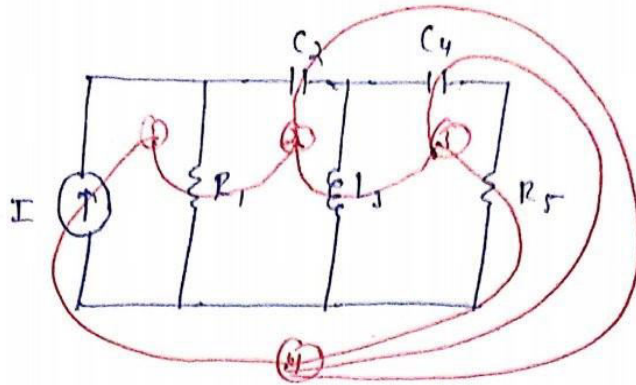
$$I_2 = 10 \angle 135^\circ \text{ A}$$

$$\text{So } I = I_1 - I_2 = 0 - 10 \angle 135^\circ \text{ A}$$

$$\boxed{I = -10 \angle 135^\circ \text{ A}} \quad \text{A2.}$$

1 marks

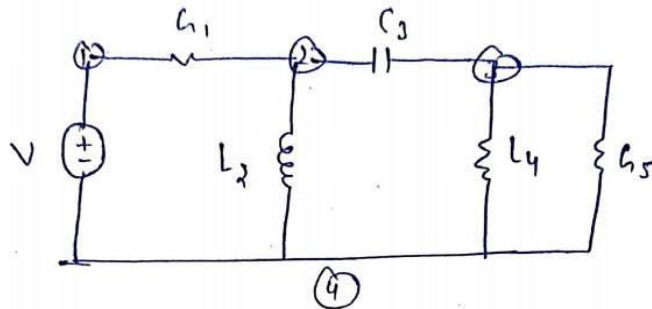
Q.6 Col



(3)

1 marks

Sol:



2 marks.

Ans.

Q.6 Col

(3)

duality:-

According to Concept of duality Each Nwk can be represent by a dual Nwk which give same result as That of standard Nwk. For Finding dual Nwk we can

marks.  
(1)

$$R \leftrightarrow C$$

$$C \leftrightarrow L$$

$$V \leftrightarrow I$$

$$\text{mess} \leftrightarrow \text{Node}$$

$$KVL \leftrightarrow KCL$$

$$VS \leftrightarrow CS$$

(2) marks.

Unit Test-2 Solution

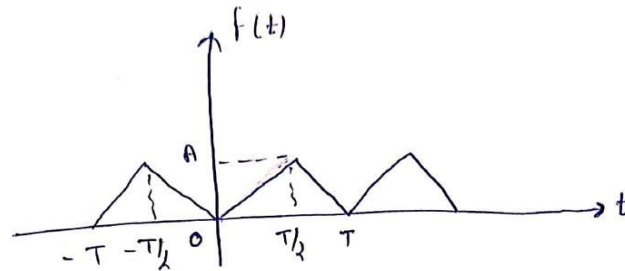
Q.1 (a) True.

Q.2 (a)  $P_L = P_{th}$

Q.3 (b) False

Q.4 (a) True.

Q.5 (a)



Step(i) Time period  $T_0 = T$

$$\text{So } \omega_0 = \frac{2\pi}{T}$$

Step(ii) Even symmetry.  $a_0 = \frac{1}{T} \int_0^{T/2} x(t) dt$

Step(iii)  $a_n = \frac{2}{T} \int_0^{T/2} x(t) \cos n \frac{2\pi}{T} t dt$

$$x(t) = \frac{2A}{T} t \quad 0 \leq t < T/2 \quad b_n = 0$$

$$a_0 = \frac{1}{T} \int_0^{T/2} \frac{2A}{T} t dt$$

$$\Rightarrow \frac{1}{T} \frac{2A}{T} \left( \frac{t^2}{2} \right)_0^{T/2}$$

$$= \frac{2A}{2T^2} \left[ \frac{T^2}{4} - 0 \right] = \frac{A}{4}$$

$$a_n = \frac{2}{T} \int_0^{T/2} \frac{2A}{T} t \cos n \frac{2\pi}{T} t dt$$

$$= \frac{4A}{T^2} \left[ \left( \frac{t \sin n \frac{2\pi}{T} t}{n \frac{2\pi}{T}} \right)_0^{T/2} - \int_0^{T/2} (1) \frac{\sin n \frac{2\pi}{T} t}{\frac{2\pi n}{T}} dt \right]$$

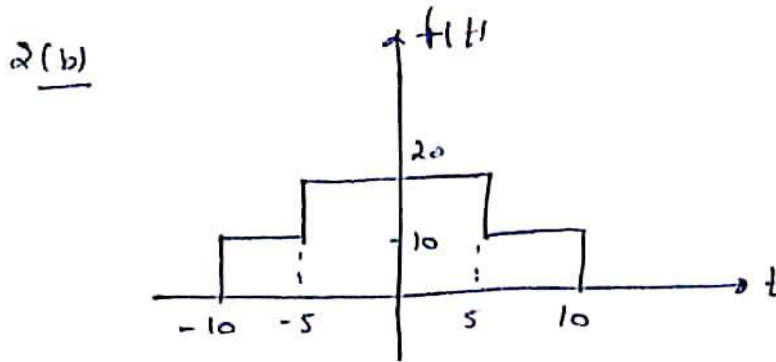
$$a_n = \frac{4A}{T^2} \times \frac{T}{2n\pi} \left[ (0-0) + \left( \cos \frac{n2\pi t}{T} \right) \Big|_0^{T/2} \right]$$

$$\Rightarrow \frac{4A}{2n\pi T} \times \frac{T}{2n\pi} [\cos n\pi - \cos 0]$$

$$a_n = \frac{A}{n^2\pi^2} [(-1)^n - 1]$$

$$b_n = 0$$

$$\text{So } f(t) = \frac{A}{4} + \sum_{n=1}^{\infty} \frac{A}{n^2\pi^2} [(-1)^n - 1] \cos n\omega t \quad \text{Ans.}$$



$$f(t) = \begin{cases} 10 & -10 < t < -5 \\ 20 & -5 < t < 5 \\ 10 & 5 < t < 10 \end{cases}$$

$$\begin{aligned} \text{Now } F(\omega) &= \int_{-10}^{-5} 10 e^{-j\omega t} dt + \int_{-5}^5 20 e^{-j\omega t} dt + \int_5^{10} 10 e^{-j\omega t} dt \\ &= 10 \left[ \frac{e^{-j\omega t}}{-j\omega} \right]_{-10}^{-5} + 20 \left[ \frac{e^{-j\omega t}}{-j\omega} \right]_{-5}^5 + 10 \left[ \frac{e^{-j\omega t}}{-j\omega} \right]_5^{10} \end{aligned}$$

$$\Rightarrow -\frac{10}{j\omega} \left[ (e^{5j\omega} - e^{10j\omega}) + 2(e^{-5j\omega} - e^{5j\omega}) + (e^{-5j\omega} - e^{-10j\omega}) \right]$$

$$\Rightarrow -\frac{10}{j\omega} \left[ (2j \sin 5\omega) - (2j \sin 10\omega) + 2j(-2 \sin 5\omega) \right]$$

$$\Rightarrow -\frac{10}{j\omega} (2j) \left[ \sin 5\omega - \sin 10\omega - 2 \sin 5\omega \right]$$

$$\Rightarrow \frac{20}{\omega} \left[ \sin 10\omega + \sin 5\omega \right] \text{ Ans.}$$

Solution unit test-3

Q.1

Sol: According to maximum power Transfer Theorem, for a source to transfer maximum power on a load, The value of load resistance should be equal to Internal Resistance of source network as seen from load terminal.

it means  $R_L = R_{th}$

①

Q.2

Sol: H Parameter means Hybrid Parameter. The eq. of h-parameter are given below

$$V_1 = h_{11} I_1 + h_{12} V_2$$

$$I_2 = h_{21} I_1 + h_{22} V_2$$

So  $h_{11} = \frac{V_1}{I_1} \Big|_{V_2=0}$  input impedance ( $\Omega$ )

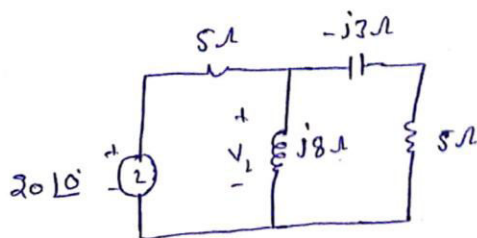
$h_{12} = \frac{V_1}{V_2} \Big|_{I_1=0}$  Rvs Voltage gain

$h_{21} = \frac{I_2}{I_1} \Big|_{V_2=0}$  Fwd Current gain

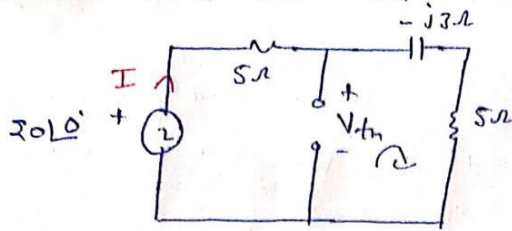
$h_{22} = \frac{I_2}{V_2} \Big|_{I_1=0}$  output admittance. ( $\Omega^{-1}$ )

①

Q.3



(a) First find out  $V_{th}$



$$+ 20\angle 0^\circ - 5I + 3jI - 5I = 0$$

$$20\angle 0^\circ = I[10 - 3j]$$

$$I = \frac{20\angle 0^\circ}{10 - 3j} \text{ A}$$

1 marks

Now KVL of outer loop

$$V_{th} + 3jI - 5I = 0$$

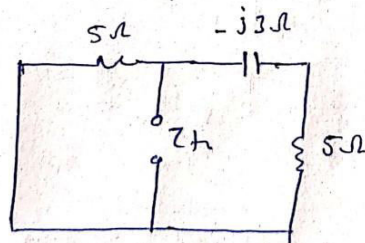
$$V_{th} = I[5 - 3j]$$

$$V_{th} = \frac{20\angle 0^\circ}{10 - 3j} (5 - 3j) = \frac{20\angle 0^\circ}{10.44 \angle -16.7^\circ} 5.83 \angle -30.96^\circ$$

$$= 11.21 \angle -14.26^\circ \text{ Volt.}$$

1 marks

(b) Now find  $Z_{th}$

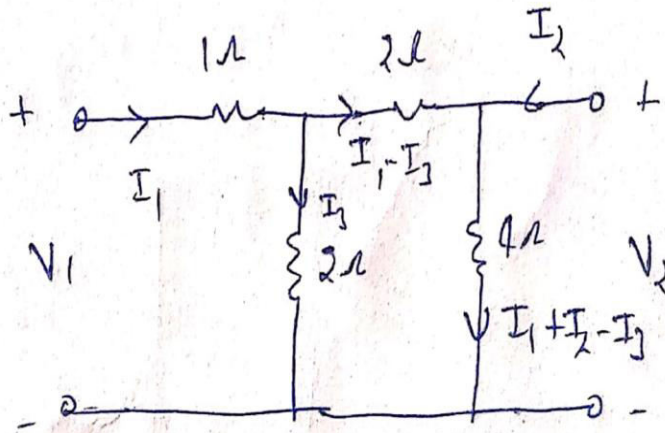


$$Z_{th} = \frac{5(5 - 3j)}{5 + 5 - 3j} = \frac{25 - 15j}{10 - 3j} = \frac{29.15 \angle -30.96^\circ}{10.44 \angle -16.7^\circ}$$

$$= 2.792 \angle -14.26^\circ \Omega$$

1 marks

Q.5



kvl in middle loop

$$2I_2 - 2(I_1 - I_3) - 4(I_1 + I_2 - I_3) = 0$$

$$\Rightarrow -6I_1 - 4I_2 + 8I_3 = 0$$

$$I_3 = \frac{3}{4}I_1 + \frac{1}{2}I_2$$

1 marks

Now apply KVL at input

$$V_1 - I_1 - 2I_2 = 0$$

$$\Rightarrow V_1 = I_1 + 2 \left[ \frac{3}{4} I_1 + \frac{1}{2} I_2 \right]$$

$$V_1 = I_1 + \frac{3}{2} I_1 + I_2$$

$$\boxed{V_1 = \frac{5}{2} I_1 + I_2}$$

1 marks

$$Z_{11} = 5/2 \Omega$$

$$Z_{12} = 1 \Omega$$

Now KVL at output

$$V_2 - 4(I_1 + I_2 - I_3) = 0$$

$$V_2 = 4 \left[ I_1 + I_2 - \frac{3}{4} I_1 - \frac{1}{2} I_2 \right]$$

$$V_2 = 4 \left[ \frac{1}{4} I_1 + \frac{1}{2} I_2 \right]$$

$$\boxed{V_2 = I_1 + 2I_2}$$

1 marks

$$Z_{21} = 1 \Omega$$

$$Z_{22} = 2 \Omega$$

$$\text{Now } |Z| = Z_{11}Z_{22} - Z_{12}Z_{21}$$

$$= \left[ \frac{5}{2} \times 2 \right] - (1 \times 1)$$

$$\Rightarrow 5 - 1 = 4 \Omega$$

$$\text{So } Y_{11} = \frac{Z_{22}}{|Z|} = \frac{2}{4} \Omega^{-1}$$

$$Y_{12} = -\frac{Z_{12}}{|Z|} = -\frac{1}{4} \Omega^{-1}$$

$$Y_{21} = -\frac{Z_{21}}{|Z|} = -\frac{1}{4} \Omega^{-1}$$

$$Y_{22} = \frac{Z_{11}}{|Z|} = \frac{5}{8} \Omega^{-1}$$

Ans

1 marks

UT-4 Solution

Q.1 In a linear NWT if a No. of Voltage or Current source are Acting together then the Value of Current or Voltage in a branch is the algebraic sum of value of current or voltage if only one source Acting at a time and replace all other <sup>independent</sup> by Their internal Resistances.

Q.2 A Trigonometric Fourier series is used to Expand a fn into its sine and cosine terms

$$x(t) = a_0 + \sum_{n=1}^{\infty} a_n \cos n\omega t + \sum_{n=1}^{\infty} b_n \sin n\omega t$$

where  $a_0 = \frac{1}{T} \int_0^T x(t) dt$

$$a_n = \frac{2}{T} \int_0^T x(t) \cos n\omega t dt$$

$$b_n = \frac{2}{T} \int_0^T x(t) \sin n\omega t dt$$

Q.3

$$V_1 = AV_2 - B I_2 \quad \text{-- (i)}$$

$$I_1 = V_1 Y_{11} + V_2 Y_{12} \quad \text{-- (iii)}$$

$$I_1 = CV_2 - D I_2 \quad \text{-- (ii)}$$

$$I_2 = \cancel{I_2} + \cancel{I_2}$$

$$V_1 Y_{21} + V_2 Y_{22} \quad \text{-- (iv)}$$

from eq (iv)

$$V_1 = \frac{I_2}{Y_{21}} - V_2 \frac{Y_{22}}{Y_{21}} \quad \text{-- (v)}$$

Compare with eq (i)

$$A = \frac{1}{Y_{21}} \quad \text{and} \quad B = -\frac{Y_{22}}{Y_{21}}$$

Now put eq (v) in eq (ii)

$$I_1 = \left[ \frac{I_2}{Y_{21}} - V_2 \frac{Y_{22}}{Y_{21}} \right] Y_{11} + V_2 Y_{12}$$

$$I_1 = I_2 \frac{Y_{11}}{Y_{21}} - V_2 \left[ \frac{Y_{11} Y_{22}}{Y_{21}} - Y_{12} \right]$$

$$I_1 = -V_2 \left[ \frac{Y_{11} Y_{22} - Y_{12} Y_{21}}{Y_{21}} \right] + I_2 \frac{Y_{11}}{Y_{21}}$$

Compare with (ii)

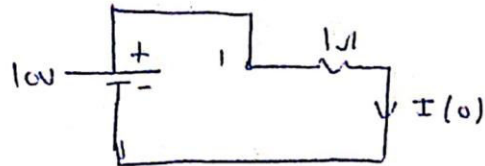
$$C = - \frac{Y_{11} Y_{22} - Y_{12} Y_{21}}{Y_{21}} \Omega$$

$$D = - \frac{Y_{11}}{Y_{21}}$$

Q#

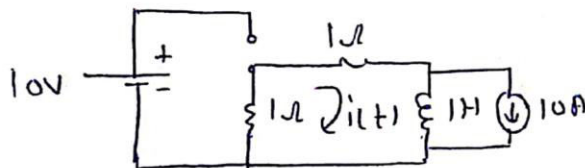
Q.4 (a)

When switch at position-1

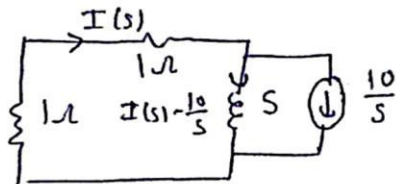


$$I(0) = \frac{10}{1} = 10A$$

Now at  $t=0$  it is moved to position-2 so



take laplace



Apply KVL

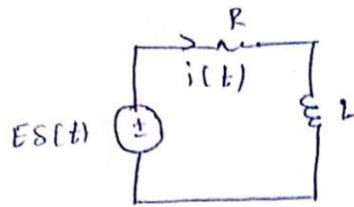
$$-I(s) - I(s) - s \left[ I(s) - \frac{10}{s} \right] = 0$$

$$\Rightarrow -I(s) [2 + s] + 10 = 0$$

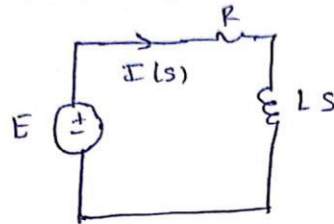
$$I(s) = \frac{10}{s+2}$$

$$i(t) = 10e^{-2t} \text{ Ans.}$$

Q.5 C.3



Take Laplace



$$E - RI(s) - LsI(s) = 0$$

$$I(s) = \frac{E}{R + Ls}$$

$$I(s) = \frac{E}{L} \frac{1}{s + R/L}$$

$$i(t) = \frac{E}{L} e^{-R/L t}$$

UT-5 MTT-3 Paper Solution

Q.1 According to maximum power transfer theorem  
A source can transfer maximum power to  
a load when value of load resistance  
is equal to the internal resistance of  
source w.r.t as seen from load terminal  
and replace all independent source by  
their internal resistance.

Q.2 KVL  $\Rightarrow$  The Algebraic sum of voltages  
in a loop is always equal to zero  
$$\sum V = 0$$

KCL  $\Rightarrow$  At a node the algebraic  
sum of current is always equal to  
zero  
$$\sum I = 0$$

- Q.3
- (i) Even symmetry.
  - (ii) Odd symmetry.
  - (iii) Half wave symmetry
  - (iv) ~~Half~~ Quarter wave symmetry.

Q.4 
$$x(t) = \sum_{n=-\infty}^{\infty} X_n e^{-jn\omega t}$$
  
Where 
$$X_n = \frac{1}{T_0} \int_{-T_0/2}^{T_0/2} x(t) e^{jn\omega t} dt$$

Q.5 Initial Value theorem

$$f(0) = \lim_{s \rightarrow \infty} sf(s)$$

And Final Value theorem

$$f(\infty) = \lim_{s \rightarrow 0} sf(s)$$

Q.6 at steady state capacitor behave  
as a open ckt.

And Inductor behave as a short ckt.

Q.7 H-parameter also called Hybrid parameter

$$V_1 = I_1 h_{11} + V_2 h_{12}$$

$$I_2 = I_1 h_{21} + V_2 h_{22}$$

$$h_{11} = \frac{V_1}{I_1} \Big|_{V_2=0} \text{ input impedance } (\Omega)$$

$$h_{12} = \frac{V_1}{V_2} \Big|_{I_1=0} \text{ RWS voltage gain}$$

$$h_{21} = \frac{I_2}{I_1} \Big|_{V_2=0} \text{ Fwd current gain}$$

$$h_{22} = \frac{I_2}{V_2} \Big|_{I_1=0} \text{ output impedance } (\Omega^{-1})$$

Q.8 Root of denominator are known as poles and root of numerator are known as zeros.

Q.9 Power factor  $\cos\phi = \frac{R}{Z}$

Q.10  $Q = \frac{1}{R} \sqrt{L/C}$

PART-II

Q.1 Col

According to Concept of duality we can find dual of Every Nwk which give same result. duality use to find out dual of a Nwk by following changes.

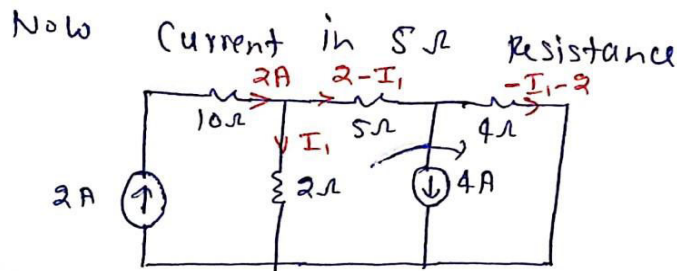
$$R \longleftrightarrow \frac{1}{G}$$

$$C \longleftrightarrow L$$

$$V \longleftrightarrow I$$

$$\text{Node} \longleftrightarrow \text{mesh}$$

$$kvi \longleftrightarrow kci$$



Apply KVL

$$2I_1 - 5(2 - I_1) - 4[-I_1 - 2] = 0$$

$$\Rightarrow 2I_1 - 10 + 5I_1 + 4I_1 + 8 = 0$$

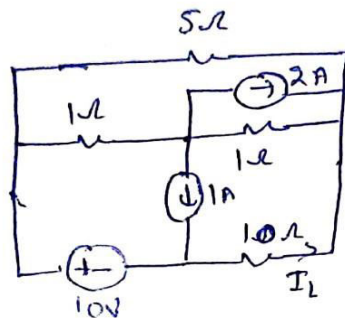
$$\Rightarrow 11I_1 - 2 = 0$$

$$I_1 = \frac{2}{11} \text{ A}$$

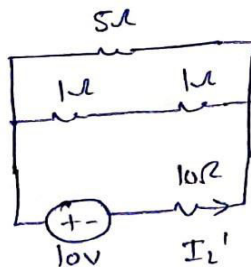
So Current In  $5\Omega$

$$2 - I_1 = 2 - \frac{2}{11} = \frac{20}{11} \text{ A}$$

Q.2 (a) Superposition:- In a linear network if a no. of voltage or current source are acting together then the value of current or voltage in a ~~part~~ branch is the algebraic sum of voltage or current if a single source acting at a time and replace all other by their internal resistances.



(case (i)) 10V alone is in working



$$I_L' = \frac{-10}{\frac{5 \times 2}{5+2} + 10}$$

$$I_L' = \frac{-10(-7)}{10+70} = -\frac{70}{80} = -\frac{7}{8} \text{ A}$$

(case (ii)) 1A is in working

$-I_1 \times 1 - (I_1 - 1) + 10 I_L'' = 0$   
 $-2 I_1 + 1 + 10 I_L'' = 0 \quad \dots (i)$   
 $-5(1 - I_1 - I_1) + 10 I_L'' = 0$   
 $\Rightarrow 15 I_L'' + 5 I_1 - 5 = 0 \quad \dots (ii)$

$$5(i) + 2(ii)$$

$$-10I_1 + 50I_1'' + 5 = 0$$

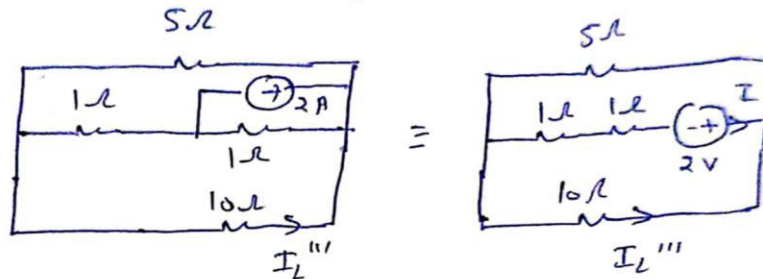
$$10I_1 + 30I_1'' - 10 = 0$$

---


$$80I_1'' - 5 = 0$$

$$I_1'' = \frac{5}{80} = \frac{1}{16} \text{ A}$$

Case (iii) 2A is in working



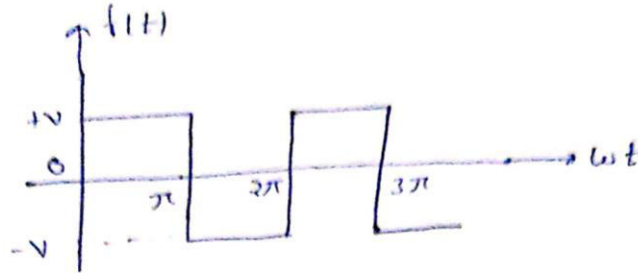
$$I = \frac{2}{\frac{5 \times 10}{5+10} + 2} = \frac{30}{50+30} = \frac{30}{80} = \frac{3}{8} \text{ A}$$

$$\text{Now } I_L''' = \frac{3/8 \times 5}{5+10} = \frac{15}{8(15)} = \frac{1}{8} \text{ A}$$

$$\text{Now } I_L = I_L' + I_L'' + I_L'''$$

$$= -\frac{7}{8} + \frac{1}{16} + \frac{1}{8} = \frac{-14+1+2}{16} = -\frac{11}{16} \text{ A}$$

Q.7



Sol:

(i) Time period  $T_0 = 2\pi$ ,  $\omega_0 = 1$

(ii) Symmetry Odd.

$$a_0 = 0, a_n = 0, b_n = \frac{1}{\pi} \int_0^{\pi} f(t) \sin nt \, dt$$

(iii)  $f(t) = +V$   $0 < t < \pi$

$$b_n = \frac{1}{\pi} \int_0^{\pi} V \sin nt \, dt$$

$$= \frac{V}{\pi} \left[ -\frac{\cos nt}{n} \right]_0^{\pi}$$

$$= -\frac{V}{n\pi} [\cos n\pi - \cos 0]$$

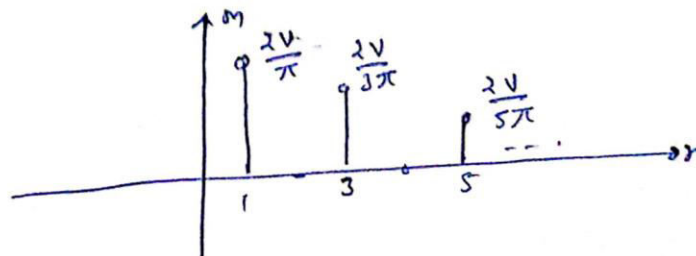
$$= -\frac{V}{n\pi} [(-1)^n - 1]$$

$$= \frac{V}{n\pi} [1 - (-1)^n]$$

$$\text{So } f(t) = \sum_{n=1}^{\infty} \frac{V}{n\pi} [1 - (-1)^n] \sin nt$$

$$= \frac{2V}{\pi} \sin t + 0 + \frac{2V}{3\pi} \sin 3t + 0 + \frac{2V}{5\pi} \sin 5t + \dots$$

$$M = \sqrt{a_n^2 + b_n^2} = \sqrt{0 + b_n^2} = |b_n|$$

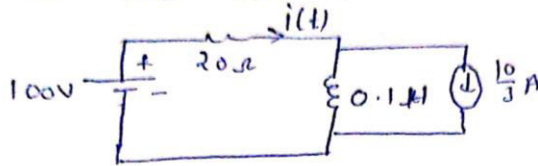


Q.4 (a)

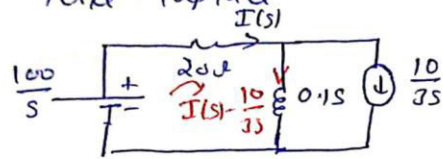
initially switch K is open

$$\text{so } I_0 = \frac{100}{30} = \frac{10}{3} \text{ A}$$

at  $t=0$  switch K is closed



take laplace



Apply KVL

$$\frac{100}{s} - 20I(s) - 0.1s \left[ I(s) - \frac{10}{3s} \right] = 0$$

$$\frac{100}{s} = 20I(s) + 0.1sI(s) - \frac{1}{3}$$

$$I(s) [20 + 0.1s] = \frac{100}{s} + \frac{1}{3}$$

$$I(s) = \frac{1000}{s(0.1s+20)} + \frac{1}{3(20+0.1s)}$$

$$I(s) = \frac{1000}{s(s+200)} + \frac{10}{3(s+200)}$$

↓

$$\frac{1000}{s(s+200)} = \frac{A}{s} + \frac{B}{s+200}$$

$$A = 5 \quad B = -5$$

$$I(s) = \frac{5}{s} - \frac{5}{s+200} + \frac{10}{3} \frac{1}{s+200}$$

$$i(t) = 5 - 5e^{-200t} + \frac{10}{3} e^{-200t} \text{ Ans.}$$

Q. 15 (a)

h-parameter

$$V_1 = I_1 h_{11} + V_2 h_{12} \quad \dots (i)$$

$$I_2 = I_1 h_{21} + V_2 h_{22} \quad \dots (ii)$$

Y-parameter

$$I_1 = V_1 Y_{11} + V_2 Y_{12} \quad \dots (iii)$$

$$I_2 = V_1 Y_{21} + V_2 Y_{22} \quad \dots (iv)$$

from (iii)

$$V_1 = \frac{I_1}{Y_{11}} - V_2 \frac{Y_{12}}{Y_{11}} \quad \dots (v)$$

Compare with (i)

$$h_{11} = \frac{1}{Y_{11}} \quad h_{12} = -\frac{Y_{12}}{Y_{11}}$$

put eq (v) in eq (ii) (iv)

$$I_2 = \left[ \frac{I_1}{Y_{11}} - V_2 \frac{Y_{12}}{Y_{11}} \right] Y_{21} + V_2 Y_{22}$$

~~$I_1 =$~~

$$I_2 = \left[ \frac{I_1}{Y_{11}} - V_2 \frac{Y_{12}}{Y_{11}} \right] Y_{21} + V_2 Y_{22}$$

$$I_2 = I_1 \frac{Y_{21}}{Y_{11}} + V_2 \left[ Y_{22} - \frac{Y_{12} Y_{21}}{Y_{11}} \right]$$

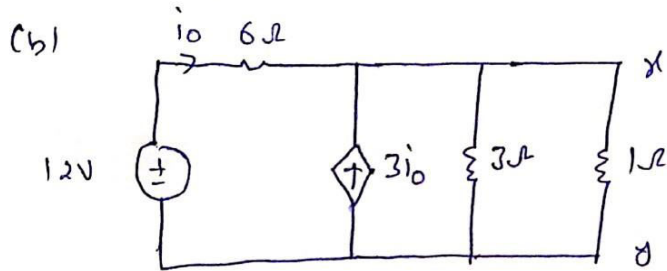
Compare with (ii)

$$h_{21} = \frac{Y_{21}}{Y_{11}} \quad h_{22} = \frac{Y_{11} Y_{22} - Y_{12} Y_{21}}{Y_{11}} \quad \underline{Ans}$$

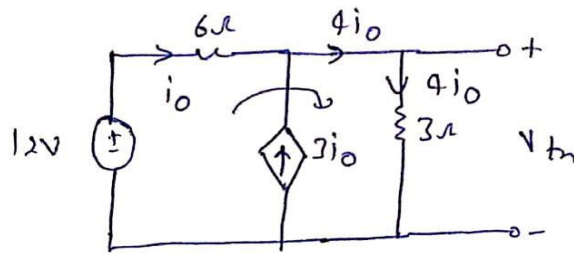
PART-C

Q.1 (c)

(a) According to maximum power transfer theorem a source can transfer maximum power to the load, if the value of load resistance is equal to the internal resistance of source network as seen from load terminal and replace all independent source by their internal resistance.



~~First~~ First find  $V_{th}$



Apply KVL

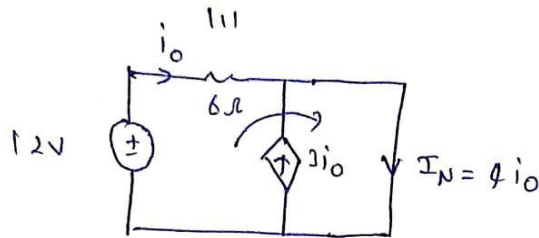
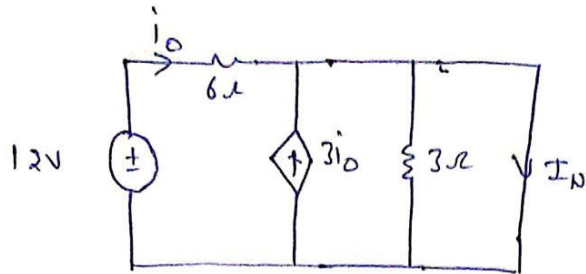
$$12 - 6i_0 - 12i_0 = 0$$

$$i_0 = \frac{12}{18} = \frac{2}{3} \text{ A}$$

$$\text{Now } V_{th} = 12i_0 = 12 \left[ \frac{2}{3} \right]$$

$$V_{th} = \frac{24}{3} \text{ Volt} = 8 \text{ Volt}$$

Now Find  $I_N$



$$12 - 6i_o = 0$$

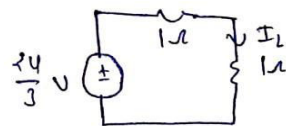
$$i_o = 2A$$

$$\text{So } I_N = 4i_o = 4 \times 2 = 8A$$

~~Now Thevenin's eq.~~

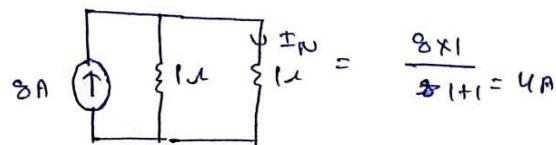
$$\text{Now } R_{th} = R_N = \frac{V_{th}}{I_N} = \frac{24}{3 \times 8} = 1\Omega$$

Now Thevenin's eq



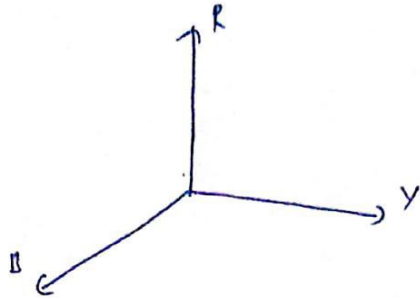
$$I_2 = \frac{24/3}{2} = \frac{12}{3} A = 4A$$

Now by Norton eq



Hence proved.

2 (a)



$$V_R = V_{ph} \angle 0^\circ$$

$$V_Y = V_{ph} \angle -120^\circ$$

$$V_B = V_{ph} \angle 120^\circ$$

$$\text{Now } V_{RY} = V_R - V_Y$$

$$= V_{ph} \angle 0^\circ - V_{ph} \angle -120^\circ$$

$$= V_{ph} [ \angle 0^\circ - \angle -120^\circ ]$$

$$= V_{ph} [ 1 - \{ \cos 120^\circ - j \sin 120^\circ \} ]$$

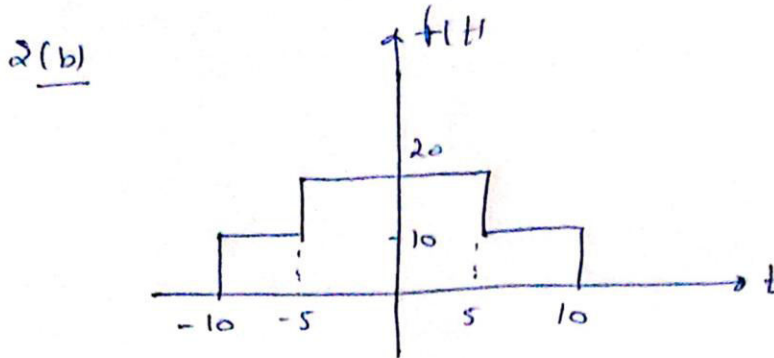
$$= V_{ph} [ 1 - \{ -\frac{1}{2} - j \frac{\sqrt{3}}{2} \} ]$$

$$= V_{ph} [ \frac{3}{2} + j \frac{\sqrt{3}}{2} ]$$

$$= \sqrt{3} V_{ph} [ \frac{\sqrt{3}}{2} + j \frac{1}{2} ]$$

$$= \sqrt{3} V_{ph} \angle 30^\circ$$

$$\text{So } \boxed{V_L = \sqrt{3} V_{ph}}$$



$$f(t) = \begin{cases} 10 & -10 < t < -5 \\ 20 & -5 < t < 5 \\ 10 & 5 < t < 10 \end{cases}$$

$$\text{Now } F(\omega) = \int_{-10}^{-5} 10 e^{-j\omega t} dt + \int_{-5}^5 20 e^{-j\omega t} dt + \int_5^{10} 10 e^{-j\omega t} dt$$

$$= 10 \left[ \frac{e^{-j\omega t}}{-j\omega} \right]_{-10}^{-5} + 20 \left[ \frac{e^{-j\omega t}}{-j\omega} \right]_{-5}^5 + 10 \left[ \frac{e^{-j\omega t}}{-j\omega} \right]_5^{10}$$

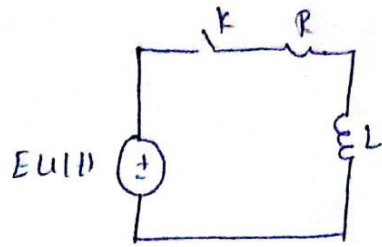
$$\Rightarrow -\frac{10}{j\omega} \left[ (e^{5j\omega} - e^{10j\omega}) \right] + 2 \left( e^{-5j\omega} - e^{5j\omega} \right) + \left( e^{-10j\omega} - e^{-5j\omega} \right)$$

$$\Rightarrow -\frac{10}{j\omega} \left[ (2j \sin 5\omega) - (2j \sin 10\omega) \right] + 2j (-2 \sin 5\omega)$$

$$\Rightarrow -\frac{10}{j\omega} (2j) \left[ \sin 5\omega - \sin 10\omega - 2 \sin 5\omega \right]$$

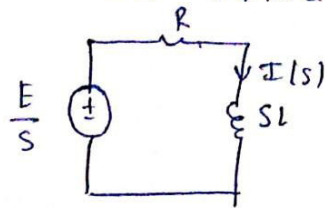
$$\Rightarrow \frac{20}{\omega} \left[ \sin 10\omega + \sin 5\omega \right] \text{ Ans.}$$

7(a)



let initial current  
 $i(0) = 0$

take Laplace



Apply KVL

$$\frac{E}{s} - R I(s) - sL I(s) = 0$$

$$I(s) = \frac{E}{s(R+sL)} = \frac{A}{s} + \frac{B}{R+sL}$$

$$A = \frac{E}{R}$$

$$B = \frac{E}{(-R/L)} = -\frac{EL}{R}$$

$$I(s) = \frac{E}{R} \frac{1}{s} - \frac{E}{R} \frac{1}{s+R/L}$$

take ILT

$$i(t) = \frac{E}{R} u(t) - \frac{E}{R} e^{-R/L t} u(t)$$

$$i(t) = \frac{E}{R} [1 - e^{-R/L t}] u(t) \quad \text{Ans.}$$

3(b)

We know That

$$\mathcal{L}[f'(t)] = \int_0^{\infty} f'(t) e^{-st} dt = sf(s) - f(0) \quad \text{---(i)}$$

take limit  $s \rightarrow 0$  both side

$$\int_0^{\infty} f'(t) dt = \lim_{s \rightarrow 0} sf(s) - f(0)$$

$$\Rightarrow [f(t)]_0^{\infty} = \lim_{s \rightarrow 0} sf(s) - f(0)$$

$$\Rightarrow f(\infty) - f(0) = \lim_{s \rightarrow 0} sf(s) - f(0)$$

$$\text{so } \boxed{f(\infty) = \lim_{s \rightarrow 0} sf(s)}$$

This is called Final Value Theorem

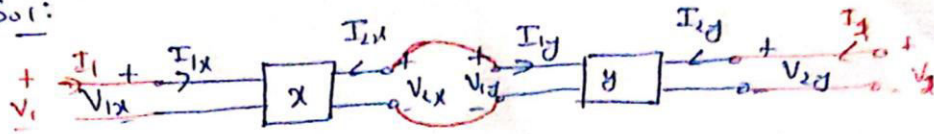
Now take limit  $s \rightarrow \infty$  both side of eq(i)

$$0 = \lim_{s \rightarrow \infty} sf(s) - f(0)$$

$$\boxed{f(0) = \lim_{s \rightarrow \infty} sf(s)}$$

u(b) u(a)

Sol:



ABCD of NWK-X

$$\begin{bmatrix} V_{1x} \\ I_{1x} \end{bmatrix} = \begin{bmatrix} A_x & B_x \\ C_x & D_x \end{bmatrix} \begin{bmatrix} V_{2x} \\ -I_{2x} \end{bmatrix} \quad \dots (a)$$

Now ABCD of Y.

$$\begin{bmatrix} V_{1y} \\ I_{1y} \end{bmatrix} = \begin{bmatrix} A_y & B_y \\ C_y & D_y \end{bmatrix} \begin{bmatrix} V_{2y} \\ -I_{2y} \end{bmatrix} \quad \dots (b)$$

Now from above NWK

$$V_1 = V_{1x} \quad \dots (i) \quad I_1 = I_{1x} \quad \dots (ii)$$

$$V_{2x} = V_{1y} \quad \dots (iii) \quad I_{2x} = -I_{1y} \quad \dots (iv)$$

$$V_2 = V_{2y} \quad \dots (v) \quad I_2 = I_{2y} \quad \dots (vi)$$

from NWK (a)

$$\begin{bmatrix} V_1 \\ I_1 \end{bmatrix} = \begin{bmatrix} A_x & B_x \\ C_x & D_x \end{bmatrix} \begin{bmatrix} V_{1y} \\ I_{1y} \end{bmatrix} \quad \left( \begin{array}{l} \text{by using eq} \\ (i), (ii), (iii) \\ \text{and (iv)} \end{array} \right)$$

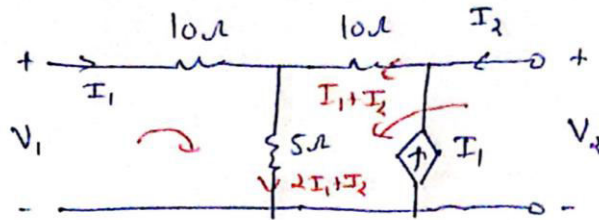
Now use eq (b)

$$\begin{bmatrix} V_1 \\ I_1 \end{bmatrix} = \begin{bmatrix} A_x & B_x \\ C_x & D_x \end{bmatrix} \begin{bmatrix} A_y & B_y \\ C_y & D_y \end{bmatrix} \begin{bmatrix} V_{2y} \\ -I_{2y} \end{bmatrix}$$

Now use eq (v) and (vi)

$$\begin{bmatrix} V_1 \\ I_1 \end{bmatrix} = \begin{bmatrix} A_x & B_x \\ C_x & D_x \end{bmatrix} \begin{bmatrix} A_y & B_y \\ C_y & D_y \end{bmatrix} \begin{bmatrix} V_2 \\ -I_2 \end{bmatrix} \quad \text{Ans.}$$

4.(b)



Apply KVL at input loop

$$V_1 = 10I_1 + 5(2I_1 + I_2)$$

$$V_1 = 20I_1 + 5I_2$$

And  $V_1 = Z_{11}I_1 + Z_{12}I_2$

$$\left. \begin{aligned} \text{So } Z_{11} &= 20\Omega \\ Z_{12} &= 5\Omega \end{aligned} \right\} \text{Ans.}$$

Now KVL at output loop

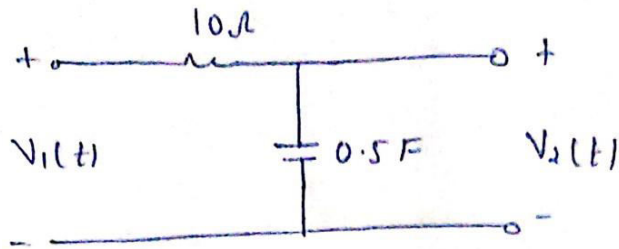
$$V_2 - 10(I_1 + I_2) - 5(2I_1 + I_2) = 0$$

$$V_2 = 20I_1 + 15I_2$$

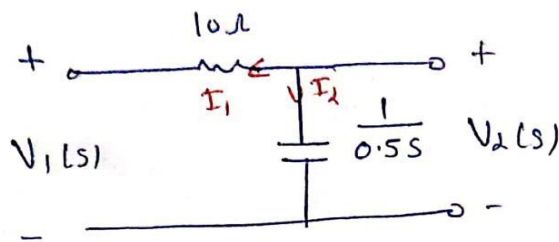
$$Z_{21} = 20\Omega$$

$$Z_{22} = 15\Omega \quad \text{Ans.}$$

5(b)



take laplace



at by KCL

$$I_1 + I_2 = 0$$

$$\frac{V_2(s) - V_1(s)}{10} + \frac{V_2(s) - 0}{\frac{1}{0.5s}} = 0$$

$$\Rightarrow V_2(s) \left[ \frac{1}{10} + \frac{s}{2} \right] = \frac{V_1(s)}{10}$$

$$V_2(s) \left[ \frac{1+5s}{10} \right] = \frac{V_1(s)}{10}$$

$$\boxed{\frac{V_2(s)}{V_1(s)} = \frac{1}{1+5s}}$$

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE  
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE, JAIPUR					
ECE-III SEM MAIN EXAM STUDENTS LIST-2019-20					
Name of faculty: Raj Kumar Jain		Section-A	SUB With Code: Network Theory (3EC4-06 )		
Section-A		SUB With Code: Network Theory (3EC4-06 )	Unit Test-1		
			CO1		Total
S.NO.	ROLL NO	NAME	Marks=10	Target Achieved	MM=10
1	18EJCEC001	AAKASH CHAMOLI	8	Y	8
2	18EJCEC003	ABHINAV DADHICH	7	Y	7
3	18EJCEC004	ABHINAV SHARMA	ABSENT		
4	18EJCEC005	ABHISHEK DAVE	10	Y	10
5	18EJCEC006	ABHISHEK JAIN	10	Y	10
6	18EJCEC007	ADITYA YADAV	ABSENT		
7	18EJCEC008	AJAY KUMAR MEENA	0	N	0
8	18EJCEC009	AKASH ARORA	8	Y	8
9	18EJCEC010	AKSHAT SHARMA	4	N	4
10	18EJCEC011	AKSHAT TODI	4	N	4
11	18EJCEC012	AKSHAY KUMAR BENIWAL	7	Y	7
12	18EJCEC014	AMAN JAIN	7	Y	7
13	18EJCEC015	AMAN KUMAR JANGIR	10	Y	10
14	18EJCEC016	AMIT KUMAR CHHIPA	3	N	3
15	18EJCEC017	ANCHAL MADNANI	4	N	4
16	18EJCEC018	ANJALI	8	Y	8
17	18EJCEC019	ANKIT KUMAR SHARMA	9	Y	9
18	18EJCEC020	ARJITA MATHUR	7	Y	7
19	18EJCEC021	ARPIT JAIN	6	Y	6
20	18EJCEC022	ARPIT KAPOOR	ABSENT		
21	18EJCEC023	ARUSHI JAIN	7	Y	7
22	18EJCEC024	ARYAN JAIN	8	Y	8
23	18EJCEC025	ASHISH JAIN	8	Y	8
24	18EJCEC026	ASHISH JANGID	5	N	5
25	18EJCEC027	ASHISH MANGAL	9	Y	9
26	18EJCEC028	ASHISH RAJ	9	Y	9
27	18EJCEC029	ASHISH YADAV	2	N	2
28	18EJCEC030	ASHOK SINGH GURJAR	10	Y	10
29	18EJCEC031	ASHUTOSH KAUSHIK	2	N	2
30	18EJCEC033	ASHYA JAIN	7	Y	7
31	18EJCEC034	ASMIT KUMAR PARIDA	ABSENT		
32	18EJCEC035	ASTHA GOYAL	6	Y	6

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE  
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

33	18EJCEC036	ATUL KUMAR AGRAWAL	3	N	3
34	18EJCEC037	AYUSH KUMAR	5	N	5
35	18EJCEC038	AYUSH SHARMA	6	Y	6
36	18EJCEC039	AYUSHI PRAJAPATI	5	N	5
37	18EJCEC040	BHUMI GAJJAR	7	Y	7
38	18EJCEC041	BHUPENDAR SHARMA	7	Y	7
39	18EJCEC042	CHARUL BHATI	4	N	4
40	18EJCEC043	CHHAYA AGARWAL	10	Y	10
41	18EJCEC044	CHIRAG MAHAJAN	9	Y	9
42	18EJCEC045	DARSHAN NAHATA	5	N	5
43	18EJCEC046	DEVANSHI GAUTAM	6	Y	6
44	18EJCEC047	DEVANSHI NEHRA	9	Y	9
45	18EJCEC048	DEVHUTI JOSHI	6	Y	6
46	18EJCEC049	DHEEREN MITTAL	6	Y	6
47	18EJCEC050	DIGVIJAY SINGH	8	Y	8
48	18EJCEC051	DIPANSHU TOMER	6	Y	6
49	18EJCEC052	DIVANSHU GOYANKA	ABSENT		
50	18EJCEC053	FARDEEN HUSSAIN	8	Y	8
51	18EJCEC054	GARGI JAIMAN	9	Y	9
52	18EJCEC055	GARIMA GOYAL	6	Y	6
53	18EJCEC056	GAURANG SINGHAL	7	Y	7
54	18EJCEC057	GAURAV AGRAWAL	8	Y	8
55	18EJCEC058	HARPREET SINGH	10	Y	10
<b>Total Student</b>				<b>P(59)+A(01)=60</b>	
<b>Target Achieved</b>				<b>37</b>	
<b>Target Not Achieved</b>				<b>13</b>	
<b>PERCANTAGE</b>				<b>74%</b>	

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE  
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE, JAIPUR							
ECE-III SEM MAIN EXAM STUDENTS LIST-2019-20							
Name of faculty: Raj Kumar jain		Section-A		SUB : Network Theory (3EC4-06 )			
Section-A		SUB Code: (3EC4-06 )	Unit Test-2				
			CO1		CO2		Total
S.NO.	ROLL NO	NAME	Mark s=4	Target Achieved	Mark s=6	Target Achieved	MM= 10
1	18EJCEC001	AAKASH CHAMOLI	4	Y	3	N	7
2	18EJCEC003	ABHINAV DADHICH	3	Y	4	Y	7
3	18EJCEC004	ABHINAV SHARMA	AB	AB	AB	AB	AB
4	18EJCEC005	ABHISHEK DAVE	3	Y	6	Y	9
5	18EJCEC006	ABHISHEK JAIN	4	Y	5	Y	9
6	18EJCEC007	ADITYA YADAV	2.5	Y	6	Y	9
7	18EJCEC008	AJAY KUMAR MEENA	AB	AB	AB	AB	AB
8	18EJCEC009	AKASH ARORA	3	Y	4	Y	7
9	18EJCEC010	AKSHAT SHARMA	4	Y	5	Y	9
10	18EJCEC011	AKSHAT TODI	1	N	6	Y	7
11	18EJCEC012	AKSHAY KR BENIWAL	3	Y	5	Y	8
12	18EJCEC014	AMAN JAIN	4	Y	4	Y	8
13	18EJCEC015	AMAN KUMAR JANGIR	3	Y	4	Y	7
14	18EJCEC016	AMIT KUMAR CHHIPA	3	Y	4	Y	7
15	18EJCEC017	ANCHAL MADNANI	2.5	Y	3	N	6
16	18EJCEC018	ANJALI	3	Y	4	Y	7
17	18EJCEC019	ANKIT KR SHARMA	3	Y	5	Y	8
18	18EJCEC020	ARJITA MATHUR	AB	AB	AB	AB	AB
19	18EJCEC021	ARPIT JAIN	3	Y	5	Y	8
20	18EJCEC022	ARPIT KAPOOR	AB	AB	AB	AB	AB
21	18EJCEC023	ARUSHI JAIN	0.5	N	5	Y	6
22	18EJCEC024	ARYAN JAIN	3	Y	6	Y	9
23	18EJCEC025	ASHISH JAIN	2.5	Y	4	Y	7
24	18EJCEC026	ASHISH JANGID	0	N	5	Y	5
25	18EJCEC027	ASHISH MANGAL	2.5	Y	4	Y	7
26	18EJCEC028	ASHISH RAJ	3	Y	2	N	5

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE  
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

27	18EJCEC029	ASHISH YADAV	AB	AB	AB	AB	AB
28	18EJCEC030	ASHOK SINGH GURJAR	3	Y	6	Y	9
29	18EJCEC031	ASHUTOSH KAUSHIK	AB	AB	AB	AB	AB
30	18EJCEC033	ASHYA JAIN	2.5	Y	2	N	5
31	18EJCEC034	ASMIT KUMAR PARIDA	AB	AB	AB	AB	AB
32	18EJCEC035	ASTHA GOYAL	3	Y	0	N	3
33	18EJCEC036	ATUL KR AGRAWAL	AB	AB	AB	AB	AB
34	18EJCEC037	AYUSH KUMAR	AB	AB	AB	AB	AB
35	18EJCEC038	AYUSH SHARMA	2.5	Y	1	N	4
36	18EJCEC039	AYUSHI PRAJAPATI	3	Y	2	N	5
37	18EJCEC040	BHUMI GAJJAR	3	Y	5	Y	8
38	18EJCEC041	BHUPENDAR SHARMA	1	N	4	Y	5
39	18EJCEC042	CHARUL BHATI	AB	AB	AB	AB	AB
40	18EJCEC043	CHHAYA AGARWAL	1	N	2	N	3
41	18EJCEC044	CHIRAG MAHAJAN	2	N	2	N	4
42	18EJCEC045	DARSHAN NAHATA	3	Y	4	Y	7
43	18EJCEC046	DEVANSHI GAUTAM	3	Y	3	N	6
44	18EJCEC047	DEVANSHI NEHRA	3	Y	0	N	3
45	18EJCEC048	DEVHUTI JOSHI	3	Y	2	N	5
46	18EJCEC049	DHEEREN MITTAL	1	N	2	N	3
47	18EJCEC050	DIGVIJAY SINGH	2.5	Y	3	N	6
48	18EJCEC051	DIPANSHU TOMER	AB	AB	AB	AB	AB
49	18EJCEC052	DIVANSHU GOYANKA	AB	AB	AB	AB	AB
50	18EJCEC053	FARDEEN HUSSAIN	3	Y	5	Y	8
51	18EJCEC054	GARGI JAIMAN	2.5	Y	4	Y	7
52	18EJCEC055	GARIMA GOYAL	0	N	5	Y	5
53	18EJCEC056	GAURANG SINGHAL	3	Y	4	Y	7
54	18EJCEC057	GAURAV AGRAWAL	3	Y	1.5	N	5
55	18EJCEC058	HARPREET SINGH	4	Y	5	Y	9
	<b>Total Student</b>			<b>P(43)+A (12)=55</b>		<b>P(43)+A( 12)=55</b>	
	<b>Target Achieved</b>			<b>35</b>		<b>28</b>	
	<b>Target Not Achieved</b>			<b>8</b>		<b>15</b>	
	<b>PERCANTAGE</b>			<b>81%</b>		<b>65%</b>	

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE  
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE, JAIPUR											
ECE-III SEM MAIN EXAM STUDENTS LIST-2019-20											
Name of faculty: Raj Kumar jain			Section-A		SUB With Code: Network Theory (3EC4-06 )						
			Unit Test-3								
			SUB CODE 3EC4-06		CO1		CO2		CO4		Total
S.N O.	ROLL NO	NAME	Ma rks =2	Target Achiev ed	Ma rks =2	Target Achiev ed	Ma rks =6	Target Achiev ed	MM =10		
1	18EJCEC001	AAKASH CHAMOLI	1.5	Y	1	N	5	Y	8		
2	18EJCEC003	ABHINAV DADHICH	2	Y	2	Y	6	Y	10		
3	18EJCEC004	ABHINAV SHARMA	ABSENT								
4	18EJCEC005	ABHISHEK DAVE	2	Y	2	Y	6	Y	10		
5	18EJCEC006	ABHISHEK JAIN	2	Y	2	Y	4	Y	8		
6	18EJCEC007	ADITYA YADAV	ABSENT								
7	18EJCEC008	AJAY KUMAR MEENA	1	N	0	N	1	N	2		
8	18EJCEC009	AKASH ARORA	1.5	Y	1	N	3	N	6		
9	18EJCEC010	AKSHAT SHARMA	ABSENT								
10	18EJCEC011	AKSHAT TODI	2	Y	2	Y	5	Y	9		
11	18EJCEC012	AKSHAY KR BENIWAL	ABSENT								
12	18EJCEC014	AMAN JAIN	2	Y	2	Y	5	Y	9		
13	18EJCEC015	AMAN KUMAR JANGIR	1.5	Y	1.5	Y	4	Y	7		
14	18EJCEC016	AMIT KUMAR CHHIPA	2	Y	2	Y	6	Y	10		
15	18EJCEC017	ANCHAL MADNANI	2	Y	2	Y	4	Y	8		
16	18EJCEC018	ANJALI	2	Y	2	Y	6	Y	10		
17	18EJCEC019	ANKIT KUMAR SHARMA	2	Y	2	Y	6	Y	10		
18	18EJCEC020	ARJITA MATHUR	ABSENT								
19	18EJCEC021	ARPIT JAIN	1.5	Y	1.5	Y	3	N	6		
20	18EJCEC022	ARPIT KAPOOR	2	Y	1	N	1	N	4		
21	18EJCEC023	ARUSHI JAIN	2	Y	2	Y	6	Y	10		
22	18EJCEC024	ARYAN JAIN	1.5	Y	0.5	N	3.5	N	6		
23	18EJCEC025	ASHISH JAIN	2	Y	2	Y	6	Y	10		
24	18EJCEC026	ASHISH JANGID	ABSENT								
25	18EJCEC027	ASHISH MANGAL	1.5	Y	1	N	4	Y	7		
26	18EJCEC028	ASHISH RAJ	2	Y	2	Y	5	Y	9		
27	18EJCEC029	ASHISH YADAV	1	N	0	N	0	N	1		

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE  
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

28	18EJCEC030	ASHOK SINGH GURJAR	2	Y	2	Y	3.5	N	8
29	18EJCEC031	ASHUTOSH KAUSHIK	2	Y	2	Y	0	N	4
30	18EJCEC033	ASHYA JAIN	2	Y	2	Y	6	Y	10
31	18EJCEC034	ASMIT KUMAR PARIDA	1.5	Y	1	N	5	Y	8
32	18EJCEC035	ASTHA GOYAL	1.5	Y	1	N	3	N	6
33	18EJCEC036	ATUL KUMAR AGRAWAL	1	N	1	N	1	N	3
34	18EJCEC037	AYUSH KUMAR	0.5	N	1	N	0	N	2
35	18EJCEC038	AYUSH SHARMA	1.5	Y	1	N	3	N	6
36	18EJCEC039	AYUSHI PRAJAPATI	2	Y	2	Y	6	Y	10
37	18EJCEC040	BHUMI GAJJAR	2	Y	2	Y	6	Y	10
38	18EJCEC041	BHUPENDAR SHARMA	2	Y	2	Y	6	Y	10
39	18EJCEC042	CHARUL BHATI	2	Y	2	Y	6	Y	10
40	18EJCEC043	CHHAYA AGARWAL	2	Y	2	Y	6	Y	10
41	18EJCEC044	CHIRAG MAHAJAN	2	Y	2	Y	6	Y	10
42	18EJCEC045	DARSHAN NAHATA	2	Y	2	Y	6	Y	10
43	18EJCEC046	DEVANSHI GAUTAM	2	Y	2	Y	3.5	N	8
44	18EJCEC047	DEVANSHI NEHRA	2	Y	2	Y	6	Y	10
45	18EJCEC048	DEVHUTI JOSHI	2	Y	2	Y	5	Y	9
46	18EJCEC049	DHEEREN MITTAL	1.5	Y	1.5	Y	5	Y	8
47	18EJCEC050	DIGVIJAY SINGH	2	Y	2	Y	2	N	6
48	18EJCEC051	DIPANSHU TOMER	2	Y	1.5	Y	3.5	N	7
49	18EJCEC052	DIVANSHU GOYANKA	ABSENT						
50	18EJCEC053	FARDEEN HUSSAIN	1.5	Y	1.5	Y	6	Y	9
51	18EJCEC054	GARGI JAIMAN	2	Y	2	Y	6	Y	10
52	18EJCEC055	GARIMA GOYAL	2	Y	2	Y	5	Y	9
53	18EJCEC056	GAURANG SINGHAL	2	Y	2	Y	6	Y	10
54	18EJCEC057	GAURAV AGRAWAL	2	Y	2	Y	6	Y	10
55	18EJCEC058	HARPREET SINGH	ABSENT						
	<b>Total Student</b>			<b>P(47)+ A(08)= 55</b>		<b>P(47)+ A(08)= 55</b>		<b>P(47)+ A(08)= 55</b>	
	<b>Target Achieved</b>			<b>43</b>		<b>42</b>		<b>34</b>	
	<b>Target Not Achieved</b>			<b>4</b>		<b>5</b>		<b>13</b>	
	<b>PERCANTAGE</b>			<b>91%</b>		<b>89%</b>		<b>72%</b>	

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE  
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE, JAIPUR											
ECE-III SEM MAIN EXAM STUDENTS LIST-2019-20											
Name of faculty: Raj Kumar Jain										Section-A	
SUB With Code: Network Theory (3EC4-06 )											
Section-A		SUB Code: 3EC4-06	Unit Test-4								
			CO1		CO2		CO4		CO3		Total
S.N O.	ROLL NO	NAME	Marks=2	Target Achieved	Marks=2	Target Achieved	Marks=2	Target Achieved	Marks=4	Target Achieved	MM=10
1	18EJCEC001	AAKASH CHAMOLI	2	Y	2	Y	2	Y	2.5	Y	8.5
2	18EJCEC003	ABHINAV DADHICH	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
3	18EJCEC004	ABHINAV SHARMA	ABSENT								
4	18EJCEC005	ABHISHEK DAVE	2	Y	1.5	Y	1.5	Y	4	Y	9
5	18EJCEC006	ABHISHEK JAIN	1.5	Y	1	N	1.5	Y	1.5	N	6
6	18EJCEC007	ADITYA YADAV	2	Y	1.5	Y	2	Y	3	Y	9
7	18EJCEC008	AJAY KR MEENA	1	N	1	N	1.5	Y	2	N	6
8	18EJCEC009	AKASH ARORA	1.5	Y	1.5	Y	0	N	2	N	5
9	18EJCEC010	AKSHAT SHARMA	1.5	Y	1.5	Y	1.5	Y	3	Y	8
10	18EJCEC011	AKSHAT TODI	2	Y	1	N	1	N	2	N	6
11	18EJCEC012	AKSHAY K BENIWAL	1.5	Y	1.5	Y	0	N	2	N	5
12	18EJCEC014	AMAN JAIN	2	Y	1.5	Y	1	N	2.5	Y	7
13	18EJCEC015	AMAN KR JANGIR	1.5	Y	1.5	Y	1.5	Y	2	N	7
14	18EJCEC016	AMIT KR CHHIPA	1.5	Y	1.5	Y	2	Y	3	Y	8
15	18EJCEC017	ANCHAL MADNANI	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
16	18EJCEC018	ANJALI	1.5	Y	1.5	Y	2	Y	4	Y	9
17	18EJCEC019	ANKIT KR SHARMA	1.5	Y	1.5	Y	0.5	N	2.5	Y	6
18	18EJCEC020	ARJITA MATHUR	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
19	18EJCEC021	ARPIT JAIN	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
20	18EJCEC022	ARPIT KAPOOR	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
21	18EJCEC023	ARUSHI JAIN	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
22	18EJCEC024	ARYAN JAIN	1	N	1.5	Y	1.5	Y	3	Y	7
23	18EJCEC025	ASHISH JAIN	2	Y	1	N	1	N	3	Y	7
24	18EJCEC026	ASHISH JANGID	2	Y	1	N	2	Y	2	N	7
25	18EJCEC027	ASHISH MANGAL	1.5	Y	1.5	Y	1	N	2	N	6
26	18EJCEC028	ASHISH RAJ	1.5	Y	1	N	1	N	3	Y	7

**JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

27	18EJCEC029	ASHISH YADAV	1.5	Y	1.5	Y	1	N	3	Y	7
28	18EJCEC030	ASHOK SINGH GURJAR	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
29	18EJCEC031	ASHUTOSH KAUSHIK	1	N	1	N	1	N	2	N	5
30	18EJCEC033	ASHYA JAIN	2	Y	1.5	Y	1.5	Y	3	Y	8
31	18EJCEC034	ASMIT KUMAR PARIDA	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
32	18EJCEC035	ASTHA GOYAL	1	N	1	N	1	N	1	N	4
33	18EJCEC036	ATUL KUMAR AGRAWAL	2	Y	1	N	1	N	2	N	6
34	18EJCEC037	AYUSH KUMAR	2	Y	1.5	Y	1.5	Y	2	N	7
35	18EJCEC038	AYUSH SHARMA	1.5	Y	1.5	Y	2	Y	2	N	7
36	18EJCEC039	AYUSHI PRAJAPATI	1.5	Y	1.5	Y	1.5	Y	0	N	5
37	18EJCEC040	BHUMI GAJJAR	2	Y	1	N	1	N	1	N	5
38	18EJCEC041	BHUPENDAR SHARMA	2	Y	1.5	Y	2	Y	1	N	7
39	18EJCEC042	CHARUL BHATI	1.5	Y	0	N	1.5	Y	2	N	5
40	18EJCEC043	CHHAYA AGARWAL	2	Y	1	N	1	N	3	Y	7
41	18EJCEC044	CHIRAG MAHAJAN	2	Y	1.5	Y	1	N	3	Y	8
42	18EJCEC045	DARSHAN NAHATA	1.5	Y	1.5	Y	2	Y	3	Y	8
43	18EJCEC046	DEVANSHI GAUTAM	2	Y	1.5	Y	1.5	Y	3	Y	8
44	18EJCEC047	DEVANSHI NEHRA	1.5	Y	1.5	Y	2	Y	3	Y	8
45	18EJCEC048	DEVHUTI JOSHI	1.5	Y	1.5	Y	2	Y	3	Y	8
46	18EJCEC049	DHEEREN MITTAL	1.5	Y	1.5	Y	1.5	Y	2.5	Y	7
47	18EJCEC050	DIGVIJAY SINGH	1.5	Y	1.5	Y	2	Y	4	Y	9
48	18EJCEC051	DIPANSHU TOMER	ABSENT								
49	18EJCEC052	DIVANSHU GOYANKA	ABSENT								
50	18EJCEC053	FARDEEN HUSSAIN	2	Y	1.5	Y	1.5	Y	3	Y	8
51	18EJCEC054	GARGI JAIMAN	1.5	Y	1.5	Y	2	Y	3	Y	8
52	18EJCEC055	GARIMA GOYAL	1.5	Y	1.5	Y	2	Y	4	Y	9
53	18EJCEC056	GAURANG SINGHAL	1.5	Y	2	Y	1.5	Y	3	Y	8
54	18EJCEC057	GAURAV AGRAWAL	1.5	Y	2	Y	1.5	Y	2	N	7
55	18EJCEC058	HARPREET SINGH	1.5	Y	1.5	Y	2	Y	3	Y	8
	<b>Total Student</b>			<b>P(52)+A(03)=55</b>		<b>P(52)+A(03)=55</b>		<b>P(52)+A(03)=55</b>		<b>P(52)+A(03)=55</b>	
	<b>Target Achieved</b>			<b>45</b>		<b>39</b>		<b>37</b>		<b>34</b>	
	<b>Target Not Achieved</b>			<b>7</b>		<b>13</b>		<b>15</b>		<b>18</b>	
	<b>PERCANTAGE</b>			<b>87%</b>		<b>75%</b>		<b>71%</b>		<b>65%</b>	

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE  
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE, JAIPUR**

**ECE-III SEM MAIN EXAM STUDENTS LIST-2019-20**

**Name of faculty: RAJ KUMAR JAIN**

**Section-A**

**SUB With Code: NETWORK THEORY(3EC4-06)**

Section-A	SUB Code: 3EC4-06	Unit Test-5											
		CO1		CO2		CO3		CO4		CO5		Total	
S.N O.	ROLL NO	STUDENT NAME	Ma rks =32	Tar get Ach ieve d	Ma rks =32	Tar get Ach ieve d	Ma rks =32	Tar get Ach ieve d	Ma rks =32	Tar get Ach ieve d	Ma rks =32	Tar get Ach ieve d	M M= 160
1	18EJCEC001	AAKASH CHAMOLI	25	Y	23	Y	26	Y	25	Y	23	Y	122
2	18EJCEC003	ABHINAV DADHICH	25	Y	20	Y	20	Y	14	N	23	Y	102
3	18EJCEC004	ABHINAV SHARMA	ABSENT										
4	18EJCEC005	ABHISHEK DAVE	25	Y	26	Y	23	Y	28	Y	23	Y	125
5	18EJCEC006	ABHISHEK JAIN	31	Y	31	Y	31	Y	32	Y	32	Y	157
6	18EJCEC007	ADITYA YADAV	ABSENT										
7	18EJCEC008	AJAY KUMAR MEENA	20	Y	18	N	19	Y	9	N	13	N	79
8	18EJCEC009	AKASH ARORA	29	Y	28	Y	28	Y	30	Y	27	Y	142
9	18EJCEC010	AKSHAT SHARMA	28	Y	19	Y	25	Y	29	Y	27	Y	128
10	18EJCEC011	AKSHAT TODI	5	N	6	N	2	N	1	N	1	N	15
11	18EJCEC012	AKSHAY KR BENIWAL	3	N	7	N	3	N	2	N	1	N	16
12	18EJCEC014	AMAN JAIN	23	Y	28	Y	24	Y	27	Y	28	Y	130
13	18EJCEC015	AMAN KUMAR JANGIR	28	Y	20	Y	25	Y	22	Y	20	Y	115
14	18EJCEC016	AMIT KUMAR CHHIPA	25	Y	20	Y	19	Y	19	Y	21	Y	104
15	18EJCEC017	ANCHAL MADNANI	13	N	9	N	19	Y	15	N	7	N	63
16	18EJCEC018	ANJALI	28	Y	30	Y	31	Y	31	Y	32	Y	152
17	18EJCEC019	ANKIT KR SHARMA	23	Y	20	Y	30	Y	28	Y	29	Y	130
18	18EJCEC020	ARJITA MATHUR	21	Y	22	Y	25	Y	28	Y	25	Y	121
19	18EJCEC021	ARPIT JAIN	24	Y	20	Y	20	Y	11	N	22	Y	97
20	18EJCEC022	ARPIT KAPOOR	0	N	0	N	0	N	0	N	0	N	0
21	18EJCEC023	ARUSHI JAIN	24	Y	20	Y	19	Y	19	Y	19	Y	101
22	18EJCEC024	ARYAN JAIN	24	Y	20	Y	19	Y	20	Y	22	Y	105
23	18EJCEC025	ASHISH JAIN	24	Y	20	Y	20	Y	11	N	22	Y	97

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24	18EJCEC026	ASHISH JANGID	24	Y	22	Y	19	Y	20	Y	21	Y	106
25	18EJCEC027	ASHISH MANGAL	21	Y	28	Y	24	Y	27	Y	28	Y	128
26	18EJCEC028	ASHISH RAJ	21	Y	28	Y	24	Y	22	Y	28	Y	123
27	18EJCEC029	ASHISH YADAV	15	N	15	N	11	N	10	N	6	N	57
28	18EJCEC030	ASHOK SINGH GURJAR	7	N	24	Y	26	Y	27	Y	19	Y	103
29	18EJCEC031	ASHUTOSH KAUSHIK	3	N	4	N	1	N	2	N	2	N	12
30	18EJCEC033	ASHYA JAIN	21	Y	25	Y	19	Y	19	Y	22	Y	106
31	18EJCEC034	ASMIT KUMAR PARIDA	17	N	23	Y	21	Y	23	Y	22	Y	106
32	18EJCEC035	ASTHA GOYAL	20	Y	15	N	22	Y	18	N	23	Y	98
33	18EJCEC036	ATUL KR AGRAWAL	3	N	5	N	0	N	0	N	3	N	11
34	18EJCEC037	AYUSH KUMAR	0	N	2	N	5	N	3	N	1	N	11
35	18EJCEC038	AYUSH SHARMA	25	Y	20	Y	25	Y	30	Y	21	Y	121
36	18EJCEC039	AYUSHI PRAJAPATI	29	Y	22	Y	26	Y	31	Y	21	Y	129
37	18EJCEC040	BHUMI GAJJAR	19	Y	29	Y	28	Y	28	Y	26	Y	130
38	18EJCEC041	BHUPENDAR SHARMA	20	Y	23	Y	20	Y	15	N	20	Y	98
39	18EJCEC042	CHARUL BHATI	15	N	13	N	16	N	12	N	4	N	60
40	18EJCEC043	CHHAYA AGARWAL	27	Y	29	Y	28	Y	28	Y	29	Y	141
41	18EJCEC044	CHIRAG MAHAJAN	22	Y	29	Y	25	Y	28	Y	28	Y	132
42	18EJCEC045	DARSHAN NAHATA	28	Y	25	Y	29	Y	19	Y	9	N	110
43	18EJCEC046	DEVANSHI GAUTAM	29	Y	30	Y	31	Y	31	Y	31	Y	152
44	18EJCEC047	DEVANSHI NEHRA	29	Y	18	N	26	Y	25	Y	23	Y	121
45	18EJCEC048	DEVHUTI JOSHI	20	Y	18	N	25	Y	15	N	24	Y	102
46	18EJCEC049	DHEEREN MITTAL	20	Y	18	N	26	Y	16	N	25	Y	105
47	18EJCEC050	DIGVIJAY SINGH	26	Y	28	Y	30	Y	22	Y	20	Y	126
48	18EJCEC051	DIPANSHU TOMER	ABSENT										
49	18EJCEC052	DIVANSHU GOYANKA	ABSENT										
50	18EJCEC053	FARDEEN HUSSAIN	18	N	22	Y	19	Y	20	Y	19	Y	98
51	18EJCEC054	GARGI JAIMAN	29	Y	15	N	28	Y	28	Y	11	N	111
52	18EJCEC055	GARIMA GOYAL	26	Y	28	Y	25	Y	28	Y	28	Y	135
53	18EJCEC056	GAURANG SINGHAL	29	Y	30	Y	27	Y	28	Y	30	Y	144
54	18EJCEC057	GAURAV AGRAWAL	29	Y	28	Y	27	Y	28	Y	28	Y	140
55	18EJCEC058	HARPREET SINGH	26	Y	28	Y	25	Y	28	Y	28	Y	135
	<b>Total PRESENT Student</b>			<b>51</b>		<b>51</b>		<b>51</b>		<b>51</b>		<b>51</b>	
	<b>Target Achieved</b>			<b>38</b>		<b>36</b>		<b>42</b>		<b>31</b>		<b>39</b>	
	<b>Target Not Achieved</b>			<b>13</b>		<b>15</b>		<b>9</b>		<b>20</b>		<b>12</b>	
		<b>PERCANTAGE</b>		<b>75</b>		<b>71</b>		<b>82</b>		<b>61</b>		<b>76</b>	
				<b>%</b>		<b>%</b>		<b>%</b>		<b>%</b>		<b>%</b>	

**SLOW LEARNER LIST UT 1(CO1)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC008	AJAY KUMAR MEENA
2	18EJCEC010	AKSHAT SHARMA
3	18EJCEC011	AKSHAT TODI
4	18EJCEC016	AMIT KUMAR CHHIPA
5	18EJCEC017	ANCHAL MADNANI
6	18EJCEC026	ASHISH JANGID
7	18EJCEC029	ASHISH YADAV
8	18EJCEC031	ASHUTOSH KAUSHIK
9	18EJCEC036	ATUL KUMAR AGRAWAL
10	18EJCEC037	AYUSH KUMAR
11	18EJCEC039	AYUSHI PRAJAPATI
12	18EJCEC042	CHARUL BHATI
13	18EJCEC045	DARSHAN NAHATA

**SLOW LEARNER LIST UT 2(CO1)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC011	AKSHAT TODI
2	18EJCEC023	ARUSHI JAIN
3	18EJCEC026	ASHISH JANGID
4	18EJCEC041	BHUPENDAR SHARMA
5	18EJCEC043	CHHAYA AGARWAL
6	18EJCEC044	CHIRAG MAHAJAN
7	18EJCEC049	DHEEREN MITTAL
8	18EJCEC055	GARIMA GOYAL

**SLOW LEARNER LIST UT 2(CO2)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC001	AAKASH CHAMOLI
2	18EJCEC017	ANCHAL MADNANI
3	18EJCEC028	ASHISH RAJ
4	18EJCEC033	ASHYA JAIN
5	18EJCEC035	ASTHA GOYAL
6	18EJCEC038	AYUSH SHARMA
7	18EJCEC039	AYUSHI PRAJAPATI
8	18EJCEC043	CHHAYA AGARWAL
9	18EJCEC044	CHIRAG MAHAJAN
10	18EJCEC046	DEVANSHI GAUTAM
11	18EJCEC047	DEVANSHI NEHRA
12	18EJCEC048	DEVHUTI JOSHI
13	18EJCEC049	DHEEREN MITTAL
14	18EJCEC050	DIGVIJAY SINGH
15	18EJCEC057	GAURAV AGRAWAL

**SLOW LEARNER LIST UT 3(CO1)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
7	18EJCEC008	AJAY KUMAR MEENA
27	18EJCEC029	ASHISH YADAV
33	18EJCEC036	ATUL KUMAR AGRAWAL
34	18EJCEC037	AYUSH KUMAR
55	18EJCEC058	HARPREET SINGH

**SLOW LEARNER LIST UT 3(CO2)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC001	AAKASH CHAMOLI
2	18EJCEC008	AJAY KUMAR MEENA
3	18EJCEC009	AKASH ARORA
4	18EJCEC022	ARPIT KAPOOR
5	18EJCEC024	ARYAN JAIN
6	18EJCEC027	ASHISH MANGAL
7	18EJCEC029	ASHISH YADAV
8	18EJCEC034	ASMIT KUMAR PARIDA
9	18EJCEC035	ASTHA GOYAL
10	18EJCEC036	ATUL KUMAR AGRAWAL
11	18EJCEC037	AYUSH KUMAR
12	18EJCEC038	AYUSH SHARMA
13	18EJCEC058	HARPREET SINGH

**SLOW LEARNER LIST UT 3(CO4)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC008	AJAY KUMAR MEENA
2	18EJCEC009	AKASH ARORA
3	18EJCEC021	ARPIT JAIN
4	18EJCEC022	ARPIT KAPOOR
5	18EJCEC024	ARYAN JAIN
6	18EJCEC029	ASHISH YADAV
7	18EJCEC030	ASHOK SINGH GURJAR
8	18EJCEC031	ASHUTOSH KAUSHIK
9	18EJCEC035	ASTHA GOYAL
10	18EJCEC036	ATUL KUMAR AGRAWAL
11	18EJCEC037	AYUSH KUMAR
12	18EJCEC038	AYUSH SHARMA
13	18EJCEC046	DEVANSHI GAUTAM
14	18EJCEC050	DIGVIJAY SINGH
15	18EJCEC051	DIPANSHU TOMER
16	18EJCEC058	HARPREET SINGH

**SLOW LEARNER LIST UT 4(CO1)**

1	18EJCEC008	AJAY KUMAR MEENA
2	18EJCEC024	ARYAN JAIN
3	18EJCEC031	ASHUTOSH KAUSHIK
4	18EJCEC035	ASTHA GOYAL

**SLOW LEARNER LIST UT 4(CO2)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC006	ABHISHEK JAIN
2	18EJCEC008	AJAY KUMAR MEENA
3	18EJCEC011	AKSHAT TODI
4	18EJCEC025	ASHISH JAIN
5	18EJCEC026	ASHISH JANGID
6	18EJCEC028	ASHISH RAJ
7	18EJCEC031	ASHUTOSH KAUSHIK
8	18EJCEC035	ASTHA GOYAL
9	18EJCEC036	ATUL KUMAR AGRAWAL
10	18EJCEC040	BHUMI GAJJAR
11	18EJCEC042	CHARUL BHATI
12	18EJCEC043	CHHAYA AGARWAL

**SLOW LEARNER LIST UT 4(CO3)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC009	AKASH ARORA
2	18EJCEC011	AKSHAT TODI
3	18EJCEC012	AKSHAY KUMAR BENIWAL
4	18EJCEC014	AMAN JAIN
5	18EJCEC019	ANKIT KUMAR SHARMA
6	18EJCEC025	ASHISH JAIN
7	18EJCEC027	ASHISH MANGAL
8	18EJCEC028	ASHISH RAJ
9	18EJCEC029	ASHISH YADAV
10	18EJCEC031	ASHUTOSH KAUSHIK
11	18EJCEC035	ASTHA GOYAL
12	18EJCEC036	ATUL KUMAR AGRAWAL
13	18EJCEC040	BHUMI GAJJAR
14	18EJCEC043	CHHAYA AGARWAL
15	18EJCEC044	CHIRAG MAHAJAN

**SLOW LEARNER LIST UT 4(CO4)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC006	ABHISHEK JAIN
2	18EJCEC008	AJAY KUMAR MEENA
3	18EJCEC009	AKASH ARORA
4	18EJCEC011	AKSHAT TODI
5	18EJCEC012	AKSHAY KUMAR BENIWAL
6	18EJCEC015	AMAN KUMAR JANGIR
7	18EJCEC026	ASHISH JANGID
8	18EJCEC027	ASHISH MANGAL
9	18EJCEC031	ASHUTOSH KAUSHIK
10	18EJCEC035	ASTHA GOYAL
11	18EJCEC036	ATUL KUMAR AGRAWAL
12	18EJCEC037	AYUSH KUMAR
13	18EJCEC038	AYUSH SHARMA
14	18EJCEC039	AYUSHI PRAJAPATI
15	18EJCEC040	BHUMI GAJJAR
16	18EJCEC041	BHUPENDAR SHARMA
17	18EJCEC042	CHARUL BHATI
18	18EJCEC057	GAURAV AGRAWAL

**SLOW LEARNER LIST UT 5(CO1)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC011	AKSHAT TODI
2	18EJCEC012	AKSHAY KUMAR BENIWAL
3	18EJCEC017	ANCHAL MADNANI
4	18EJCEC022	ARPIT KAPOOR
5	18EJCEC029	ASHISH YADAV
6	18EJCEC030	ASHOK SINGH GURJAR
7	18EJCEC031	ASHUTOSH KAUSHIK
8	18EJCEC034	ASMIT KUMAR PARIDA
9	18EJCEC036	ATUL KUMAR AGRAWAL
10	18EJCEC037	AYUSH KUMAR
11	18EJCEC042	CHARUL BHATI
12	18EJCEC053	FARDEEN HUSSAIN

**SLOW LEARNER LIST UT 5(CO2)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC008	AJAY KUMAR MEENA
2	18EJCEC011	AKSHAT TODI
3	18EJCEC012	AKSHAY KUMAR BENIWAL
4	18EJCEC017	ANCHAL MADNANI
5	18EJCEC022	ARPIT KAPOOR
6	18EJCEC029	ASHISH YADAV
7	18EJCEC031	ASHUTOSH KAUSHIK
8	18EJCEC035	ASTHA GOYAL
9	18EJCEC036	ATUL KUMAR AGRAWAL
10	18EJCEC037	AYUSH KUMAR
11	18EJCEC042	CHARUL BHATI
12	18EJCEC047	DEVANSHI NEHRA
13	18EJCEC048	DEVHUTI JOSHI
14	18EJCEC049	DHEEREN MITTAL
15	18EJCEC054	GARGI JAIMAN

**SLOW LEARNER LIST UT 5(CO3)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC011	AKSHAT TODI
2	18EJCEC012	AKSHAY KUMAR BENIWAL
3	18EJCEC022	ARPIT KAPOOR
4	18EJCEC029	ASHISH YADAV
5	18EJCEC031	ASHUTOSH KAUSHIK
6	18EJCEC036	ATUL KUMAR AGRAWAL
7	18EJCEC037	AYUSH KUMAR
8	18EJCEC042	CHARUL BHATI

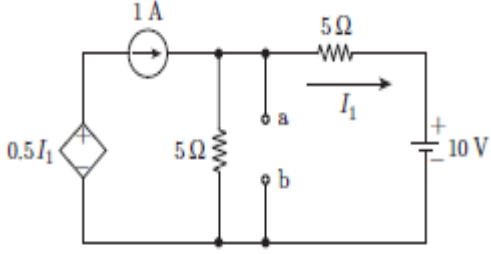
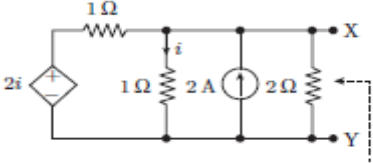
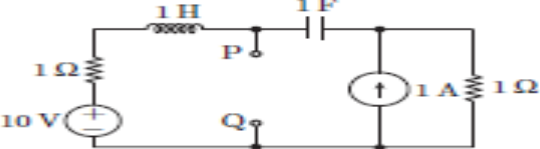
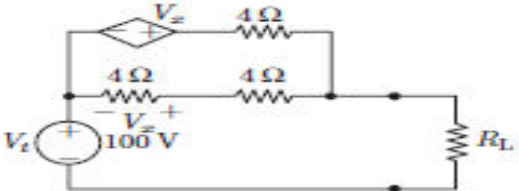
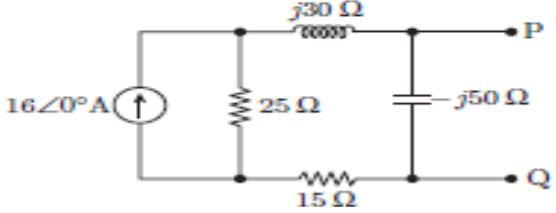
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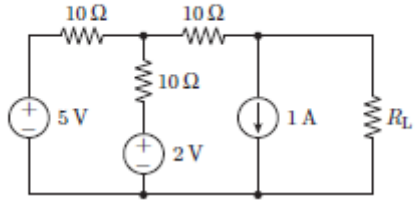
<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC003	ABHINAV DADHICH
2	18EJCEC008	AJAY KUMAR MEENA
3	18EJCEC011	AKSHAT TODI
4	18EJCEC012	AKSHAY KUMAR BENIWAL
5	18EJCEC017	ANCHAL MADNANI
6	18EJCEC021	ARPIT JAIN
7	18EJCEC022	ARPIT KAPOOR
8	18EJCEC025	ASHISH JAIN
9	18EJCEC029	ASHISH YADAV
10	18EJCEC031	ASHUTOSH KAUSHIK
11	18EJCEC035	ASTHA GOYAL
12	18EJCEC036	ATUL KUMAR AGRAWAL
13	18EJCEC037	AYUSH KUMAR
14	18EJCEC041	BHUPENDAR SHARMA
15	18EJCEC042	CHARUL BHATI
16	18EJCEC048	DEVHUTI JOSHI
17	18EJCEC049	DHEEREN MITTAL

**SLOW LEARNER LIST UT 5 (CO5)**

<b>S.NO.</b>	<b>ROLL NO</b>	<b>STUDENT NAME</b>
1	18EJCEC008	AJAY KUMAR MEENA
2	18EJCEC011	AKSHAT TODI
3	18EJCEC012	AKSHAY KUMAR BENIWAL
4	18EJCEC017	ANCHAL MADNANI
5	18EJCEC022	ARPIT KAPOOR
6	18EJCEC029	ASHISH YADAV
7	18EJCEC031	ASHUTOSH KAUSHIK
8	18EJCEC036	ATUL KUMAR AGRAWAL
9	18EJCEC037	AYUSH KUMAR
10	18EJCEC042	CHARUL BHATI
11	18EJCEC045	DARSHAN NAHATA
12	18EJCEC054	GARGI JAIMAN



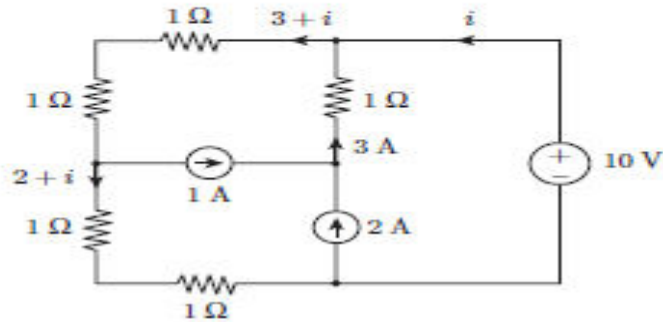
<p>Q.4/CO1</p>	 <p>For the circuit shown in the following figure Thevenin's equivalent voltage and Thevenin's equivalent resistance at terminals a-b is</p>	<p>N</p>	<p>GATE 2005</p>
<p>Q.5/CO1</p>	<p>For the circuit shown in the following figure, the Thevenin voltage and resistance looking into X-Y are</p> 	<p>N</p>	<p>GATE 2007</p>
<p>Q.6/CO1</p>	<p>The Thevenin equivalent impedance <math>Z_{TH}</math> between the nodes P and Q in the circuit shown in the following figure is</p> 	<p>N</p>	<p>GATE 2008</p>
<p>Q.7/CO1</p>	<p>In the circuit shown in the following figure, what value of <math>R_L</math> maximizes the power delivered to <math>R_L</math>?</p> 	<p>N</p>	<p>GATE 2009</p>
<p>Q.8/CO1</p>	<p>In the circuit shown in the following figure, the Norton equivalent current in amperes with respect to the terminals P and Q is</p> 	<p>N</p>	<p>GATE 2011</p>

Q.9/CO1	<p>In the circuit shown below, the value of <math>R_L</math> such that the power transferred to <math>R_L</math> is maximum is</p> 	N	GATE 2011
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### ASSIGNMENT 1 (CO1) SOLUTION

Q.1

*Solution.* The given network can be redrawn as shown in the following figure.



Applying Kirchhoff's voltage law in the outer loop, we get

$$(3 + i)2 + (2 + i)2 = 10$$

Solving the above equation, we get

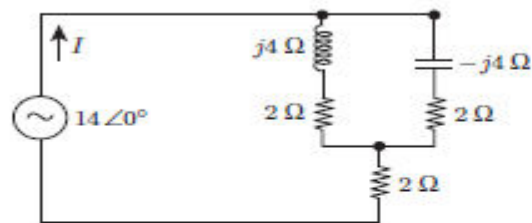
$$i = 0$$

The power supplied by the voltage source is

$$P = Vi = 10 \times 0 = 0 \text{ W}$$

Q.2

*Solution.* Converting delta into star, the circuit can be redrawn as shown below.



The equivalent impedance of the circuit is

$$Z = (2 + j4) \parallel (2 - j4) + 2$$

Solving the above equation, we get

$$Z = 7 \Omega$$

Therefore, the current  $I$  is obtained as

$$I = \frac{14\angle 0^\circ}{7} = 2\angle 0^\circ \text{ A}$$

Q3.

*Solution.* For maximum power transfer,

$$R_L = R_S = 100 \Omega$$

The voltage  $V$  across  $R_L$  is

$$V = \frac{10 \times 100}{100 + 100} = 5 \text{ V}$$

The maximum power transferred to  $R_L$  is

$$P_{\max} = \frac{V^2}{R_L} = \frac{5 \times 5}{100} = 0.25 \text{ W}$$

Q.4

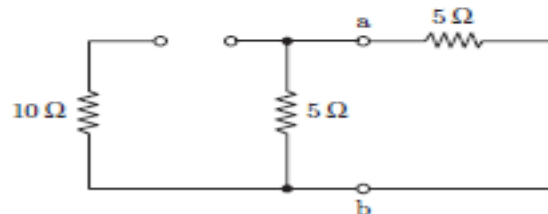
*Solution.* To calculate Thevenin's equivalent voltage  $V_{TH}$ , applying Kirchhoff's current law at terminal a, we get

$$\frac{V_{ab}}{5} + \frac{V_{ab} - 10}{5} = 1$$

(When current source is in series with voltage source effect of current source is taken.). Solving the above equation, we get

$$V_{ab} = 7.5 \text{ V}$$

To calculate the Thevenin's equivalent resistance,  $R_{TH}$ , short circuit the independent voltage source and open circuit the independent current source as shown in the following figure.



Therefore,

$$R_{TH} = 5 \parallel 5 = 2.5 \Omega$$

Q.5

*Solution.* Let  $V_{TH}$  be the Thevenin's equivalent voltage across X-Y. Applying Kirchhoff's current law at node X, we get

$$2 = \frac{V_{TH}}{2} + \frac{V_{TH}}{1} + \frac{V_{TH} - 2i}{1}$$

where

$$i = \frac{V_{TH}}{1}$$

Therefore,

$$2 = V_{TH} \left( \frac{1}{2} + \frac{1}{1} + \frac{1}{1} - \frac{2}{1} \right)$$

Hence,

$$V_{TH} = 4 \text{ V}$$

From the figure, the short-circuit current is

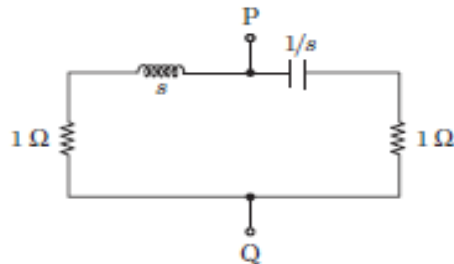
$$I_{sc} = 2 \text{ A}$$

Therefore,

$$R_{TH} = \frac{V_{TH}}{I_{sc}} = \frac{4}{2} = 2 \Omega$$

Q, 6

*Solution.* The figure given below shows the equivalent circuit of the network given in the problem, with the circuit elements being replaced by their impedances and the independent sources being deactivated.

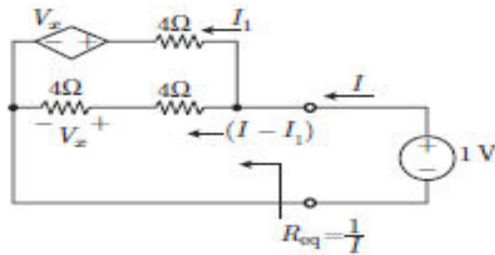


Therefore, the Thevenin's equivalent resistance between P and Q is given by

$$\begin{aligned} Z_{TH} &= (s+1) \parallel \left( 1 + \frac{1}{s} \right) = \frac{(s+1)[1 + (1/s)]}{(s+1) + 1 + (1/s)} \\ &= \frac{(s+1)^2/s}{(s+1)(s+1)/s} = 1 \end{aligned}$$

Q7.

*Solution.* The circuit given in the problem can be replaced by the figure shown below after applying 1 V source to the load terminals and short circuiting the voltage source of 100 V.



For the maximum power transfer,

$$R_L = R_{eq}$$

Applying Kirchhoff's voltage law to the outer loop, we get

$$1 = 4I_1 + V_x$$

Also,

$$V_x = 4(I - I_1)$$

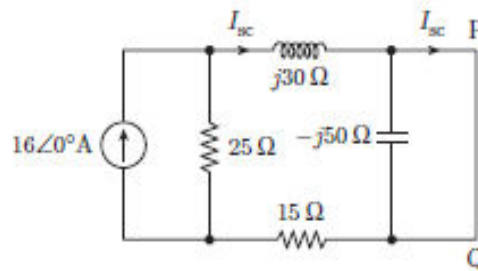
From the above two equations, we get

$$I = \frac{1}{4} \text{ A}$$

Therefore,

$$R_{eq} = \frac{1}{I} = 4 \Omega$$

Q.8



The short circuit current is

$$\begin{aligned} I_{sc} &= \frac{25}{15 + j30 + 25} \times 16\angle 0^\circ = \frac{25}{40 + j30} \times 16\angle 0^\circ \\ &= \frac{(25 \times 16)\angle 0^\circ}{50\angle 36.86^\circ} = 8\angle -36.86^\circ \end{aligned}$$

Hence, the Norton current is

$$\begin{aligned} I_N = I_{sc} &= 8\angle -36.86^\circ \\ &= (6.4 - j4.8) \text{ A} \end{aligned}$$

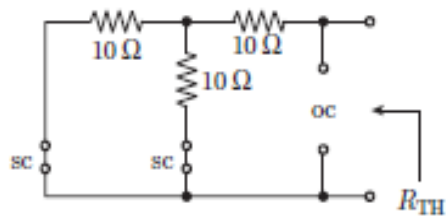
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Q9.

*Solution.* For maximum power transfer,

$$R_L = R_{TH}$$

To calculate  $R_{TH}$ , short circuit the voltage sources and open circuit the current sources as depicted in the following figure.



Therefore,

$$R_{TH} = 10 + 10 \parallel 10 = 15\ \Omega$$

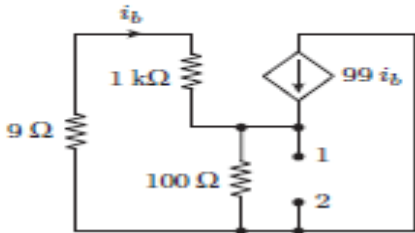
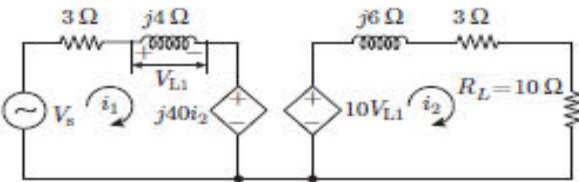
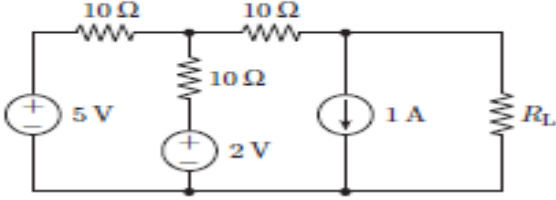
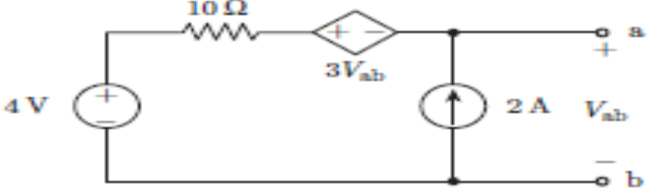
**SLOW LEARNER ASSIGNMENT**

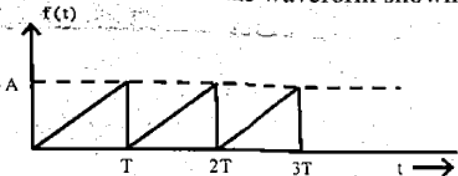
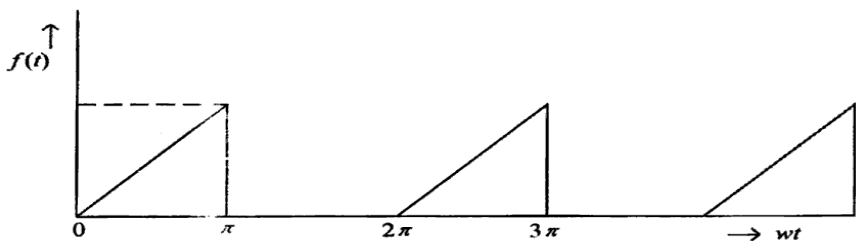
<b>SUBJECT:</b> NETWORK THEORY 3EC04-06	<b>Session:</b> 2019-20
<b>Faculty Name:</b> RAJ KUMAR JAIN (AP)	<b>DOA:</b> 10-08-2019
	<b>DOS:</b> 12-08-2019

**ASSIGNMENT NO. 2(CO1 & CO2)**

CO1: Apply the basic circuit law and simplify the network using network theorems.

CO2: Appreciate the frequency domain techniques in different applications.

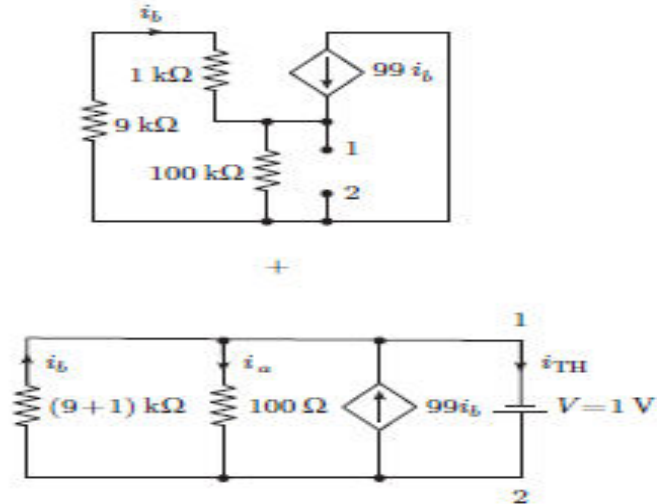
Q.1/CO1	<p>The impedance looking into nodes 1 and 2 in the circuit shown in the following figure is</p> 	N	GATE 2012
Q.2/CO1	 <p>In the circuit shown in the following figure, if the source voltage <math>V_s = 100 \angle 53.13^\circ V</math>, then the Thevenin's equivalent voltage (in volts) as seen by the load resistance <math>R_L</math> is</p>	N	GATE 2013
Q.3/CO1	<p>In the circuit shown below, the value of <math>R_L</math> such that the power transferred to <math>R_L</math> is maximum is</p> 	N	GATE 2011
Q.4/CO1	<p>What is the voltage <math>V_{ab}</math> in volts for the circuit shown in the following figure.</p> 	N	GATE 2006

Q.5/CO2	The rms value of a rectangular wave of period 10s, having a value of +10 V for a duration of 4 s and -10 V for the duration of 6 s equals _____.	N	IES 2007
Q.6/CO2	The four-point discrete Fourier transform (DFT) of a discrete-time sequence {1, 0, 2, 3} is	N	GATE 2009
Q.7/CO2	<p>Determine the effective value of <math>f(t)</math> of the waveform shown in figure 3.</p> 	N	RTU 2010
Q.8/CO1	<p>b) Find the fourier series of waveform shown in fig. and also find line spectrum.(8)</p> 	N	RTU 2011

### ASSIGNMENT 2 (CO1 & CO2) SOLUTION

Q.1

*Solution.* To find the Thevenin's equivalent impedance across nodes 1 and 2, connect a 1 V source and find the current through the voltage source as shown in the following figure.



Thevenin's impedance is

$$Z_{TH} = \frac{1}{I}$$

By applying Kirchhoff's current law at node 1, we get

$$i_b - i_a + 99i_b = i_{TH}$$

Therefore,

$$100i_b - i_a = i_{TH}$$

By applying Kirchhoff's voltage law to the outer loop, we get

$$10 \times 10^3 i_b = 1$$

Therefore,

$$i_b = 10^{-4} \text{ A}$$

Applying Kirchhoff's voltage law in the first loop, we get

$$10 \times 10^3 i_b = -100 i_a$$

Therefore,

$$i_a = -100 i_b$$

Substituting the value of  $i_a$  in the expression,

$$100i_b - i_a = i_{TH}$$

we get

$$100i_b + 100i_a = i_{TH}$$

Therefore,

$$i_{TH} = 200i_b = 200 \times 10^{-4} = 0.02 \text{ A}$$

Hence,

$$Z_{TH} = \frac{1}{i_{TH}} = \frac{1}{0.02} = 50 \text{ } \Omega$$

Q.2

Sol.

$$V_{L1} = \frac{V_s - (j4)}{3 + j4} = \frac{100 \angle 53.13^\circ}{5 \angle 53.13^\circ} \times 4 \angle 90^\circ = 80 \angle 90^\circ$$

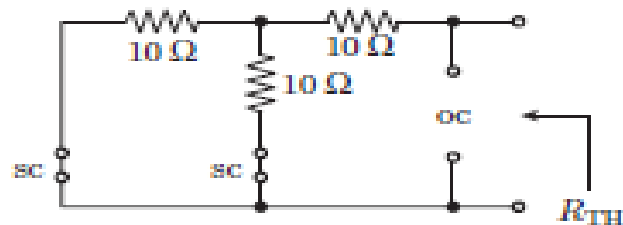
$$\begin{aligned} V_{TH} &= 10V_{L1} + i_2 \times j6 + i_2 \times 3 \\ &= 10 \times 80 \angle 90^\circ + 0 \times j6 + 0 \times 3 \\ &= 800 \angle 90^\circ \end{aligned}$$

Q3.

*Solution.* For maximum power transfer,

$$R_L = R_{TH}$$

To calculate  $R_{TH}$ , short circuit the voltage sources and open circuit the current sources as depicted in the following figure.



Therefore,

$$R_{TH} = 10 + 10 \parallel 10 = 15\ \Omega$$

Q5.

*Solution.* The rms value of any signal  $x(t)$  having time period  $T$  is given by

$$\text{RMS} = \sqrt{\frac{1}{T} \int_0^T x^2(t) dt}$$

Therefore, the rms value of the given signal is

$$\begin{aligned} & \sqrt{\frac{1}{10} \left[ \int_0^4 10^2 dt + \int_4^{10} (-10)^2 dt \right]} \\ &= \sqrt{\frac{1}{10} [10^2 [4 - 0] + (-10)^2 (10 - 4)]} \\ &= \sqrt{10^2} \\ &= 10 \end{aligned}$$

Q6

*Solution.* The four-point DFT of sequence  $\{1, 0, 2, 3\}$  is given as

$$\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & -j & -1 & j \\ 1 & -1 & 1 & -1 \\ 1 & j & -1 & -j \end{bmatrix} \begin{bmatrix} 1 \\ 0 \\ 2 \\ 3 \end{bmatrix} = \begin{bmatrix} 1 & +2 & +3 \\ 1 & -2 & 3j \\ 1 & +2 & -3 \\ 1 & -2 & -3j \end{bmatrix} = \begin{bmatrix} 6 \\ -1 + 3j \\ 0 \\ -1 - 3j \end{bmatrix}$$

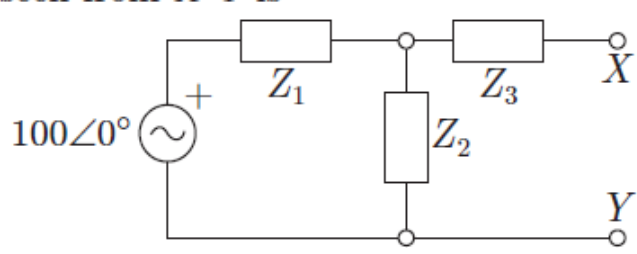
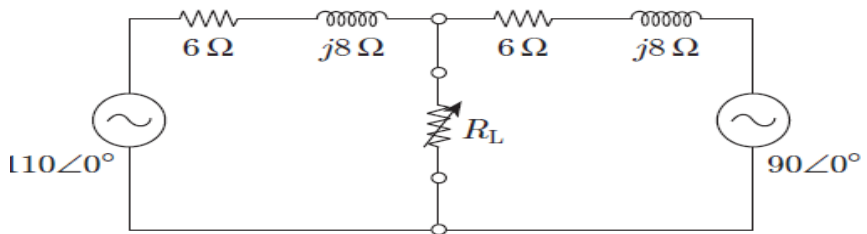
Therefore, DFT of the given sequence is  $[6, -1 + 3j, 0, -1 - 3j]$ .

Q7

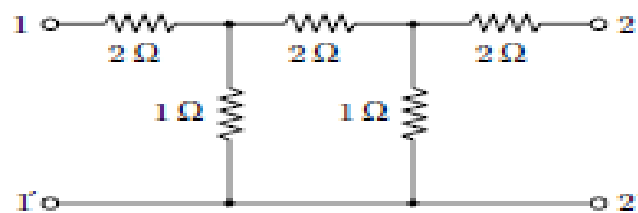
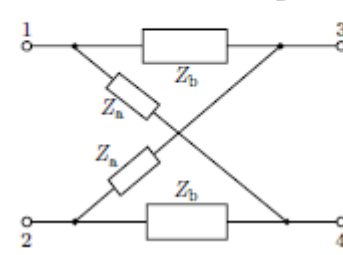
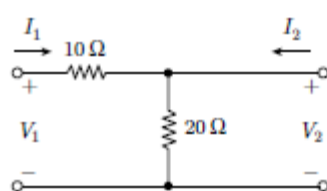
$$\begin{aligned} \therefore (\text{Effective value})^2 &= \frac{1}{T} \int_0^T [f(t)]^2 dt = \frac{1}{T} \int_0^T \left( \frac{A}{T} t \right)^2 dt \\ &= \frac{1}{T} \cdot \frac{A^2}{T^2} \int_0^T t^2 dt = \frac{A^2}{T^3} \cdot \left( \frac{t^3}{3} \right) \Big|_0^T = \frac{A^2}{3} \end{aligned}$$

$$\therefore \text{Effective value} = (A / \sqrt{3})$$

<b>SLOW LEARNER ASSIGNMENT</b>		
<b>Department of Electronics &amp; Communication Engineering</b>		
COURSE : B. Tech (II Year)	SEMESTER: III	SECTION: A
SUBJECT: NETWORK THEORY 3EC04-06		Session: 2019-20
Faculty Name: RAJ KUMAR JAIN (AP)	DOA: 30-08-2019	DOS: 3-09-2019
<b>ASSIGNMENT NO. 3 (CO1 ,CO2 &amp; CO4)</b>		
CO1: Apply the basic circuit law and simplify the network using network theorems.		
CO2: Appreciate the frequency domain techniques in different applications.		
CO4: Evaluate transient response and two-port network parameters.		

Q.1/CO1	<p>In the figure given below, <math>Z_1 = 10\angle -60^\circ</math>, <math>Z_2 = 10\angle 60^\circ</math>, <math>Z_3 = 50\angle 53.13^\circ</math>. Thevenin impedance seen from X-Y is</p> 	N	GATE 2003
Q.2/CO1	<p>6. Two AC sources feed a common variable resistive load as shown in the figure given below. Under the maximum power transfer condition, the power absorbed by the load resistance <math>R_L</math> is</p> 	N	GATE 2003

Q.3/CO1	<p><b>7. In the given figure, the value of <math>R</math> is</b></p>	N	GATE 2003
Q.4/CO2	<p>Determine the Fourier series for the square waveform shown below and plot the magnitude and the phase spectra.</p>	N	RTU 2013
Q.5/CO2	<p>Find the Fourier series expansion of the rectified sine waveforms shown in the following figure.</p>	N	RTU 2015
Q.6/CO2	<p>(ii) Determine the fundamental frequency current in the circuit of fig 3.1 (b) where, <math>R = 15\ \Omega</math> &amp; <math>L = 0.0438\ \text{H}</math> with voltage transform as in fig 3.1 (a) -</p>	N	RTU 2018
Q.7/CO2	<p>Determine the effective value of <math>f(t)</math> of the waveform shown in figure 3.</p>	N	RTU 2010

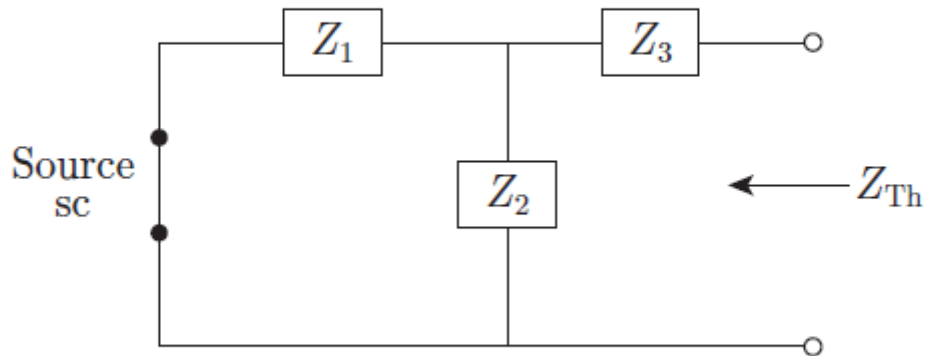
Q.8/CO4	<p>The impedance parameters <math>Z_{11}</math> and <math>Z_{12}</math> of the two-port network shown in the following figure are</p> 	N	RTU 2003
Q.9/CO4	<p>For the lattice circuit shown in the following figure, <math>Z_a = j2 \Omega</math> and <math>Z_b = 2 \Omega</math>. The values of the open circuit impedance parameters <math>Z = \begin{bmatrix} Z_{11} &amp; Z_{12} \\ Z_{21} &amp; Z_{22} \end{bmatrix}</math> are</p> 	N	RTU 2004
Q.10/CO4	<p>The <math>h</math>-parameters of the circuit shown in the following figure are</p> 		RTU 2005
Q.11/CO4	<p>A two-port network is represented by <math>ABCD</math> parameters given by <math>\begin{bmatrix} V_1 \\ I_1 \end{bmatrix} = \begin{bmatrix} A &amp; B \\ C &amp; D \end{bmatrix} \begin{bmatrix} V_2 \\ -I_2 \end{bmatrix}</math>. If port 2 is terminated by <math>R_L</math>, the input impedance seen at port 1 is given by</p> <p>(a) <math>\frac{A + BR_L}{C + DR_L}</math>                      (b) <math>\frac{AR_L + C}{BR_L + D}</math>  (c) <math>\frac{DR_L + A}{BR_L + C}</math>                      (d) <math>\frac{B + AR_L}{D + CR_L}</math></p>	N	RTU 2006

ASSIGNMENT 3 SOLUTION

Q.1

*Solution:* Given that

$$Z_1 = 10\angle -60^\circ, Z_2 = 10\angle 60^\circ, Z_3 = 50\angle 53.13^\circ$$



To obtain Thevenin impedance, short circuit the source. Therefore,

$$Z_{Th} = Z_3 + (Z_1 \parallel Z_2)$$

Convert polar co-ordinates into rectangular co-ordinates.

$$Z_1 = 5(1 - \sqrt{3}j) \quad Z_2 = 5(1 + \sqrt{3}j) \quad Z_3 = 10(3 + 4j).$$

$$\begin{aligned} Z_{th} &= 10(3 + 4j) + \left[ \frac{5(1 - \sqrt{3}j) \times 5(1 + \sqrt{3}j)}{5(1 - \sqrt{3}j) + 5(1 + \sqrt{3}j)} \right] \\ &= 40 + 40j \end{aligned}$$

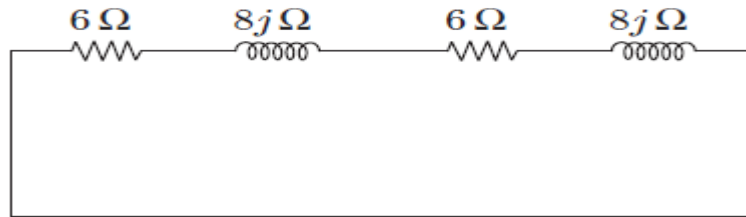
$$Z_{Th} \text{ in polar co-ordinates} = 40\sqrt{2} \cdot \angle 45^\circ \Omega$$

Q.2

*Solution:* For maximum power transfer,

$$R_L = |Z_{Th}| \quad \text{and} \quad P = I^2 R_L$$

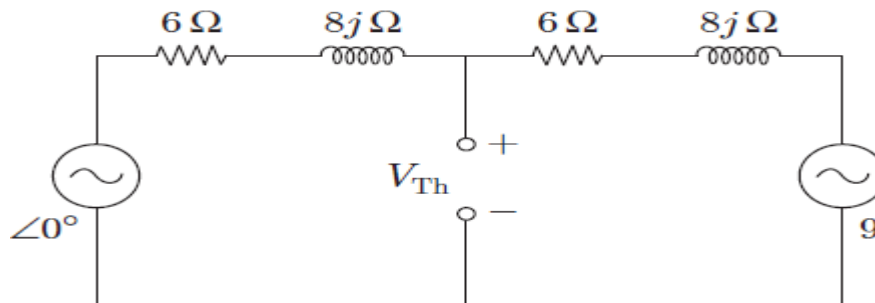
To find the Thevenin impedance, short circuit voltage source



$$\begin{aligned} Z_{Th} &= (6 + 8j\Omega) \parallel (6 + 8j\Omega) \\ &= \frac{(6 + 8j\Omega) \times (6 + 8j\Omega)}{(6 + 8j\Omega) + (6 + 8j\Omega)} \\ &= 3 + 4j\Omega \end{aligned}$$

Therefore,  $R_L = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$

To find the Thevenin's voltage, open the load



By nodal analysis method,

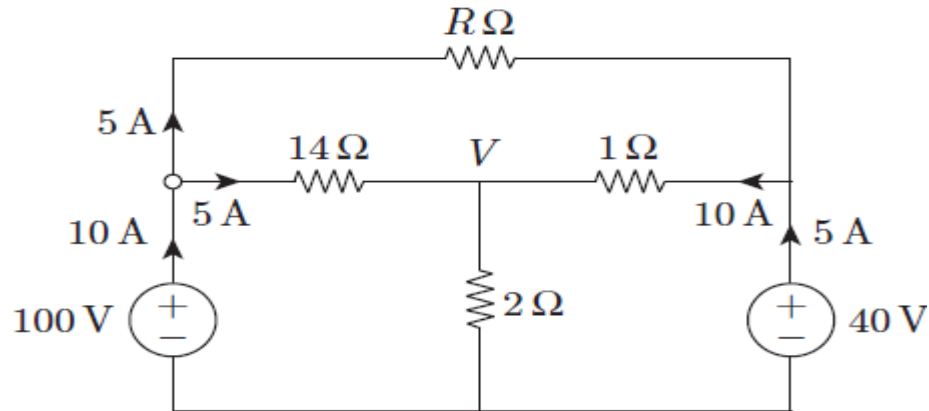
$$\begin{aligned} \frac{V_{Th} - 110\angle 0^\circ}{6 + 8j} + \frac{V_{Th} - 90\angle 0^\circ}{6 + 8j} &= 0 \\ V_{Th} - 100\angle 0^\circ &= 0 \end{aligned}$$

Therefore,

$$\begin{aligned} P &= \frac{V_{Th}}{R_{Th} + R_L} \cdot R_L = \left| \frac{100}{(3 + 4j) + 5} \right|^2 \times 5 \\ &= \frac{(100)^2 \times 5}{80} = 625 \text{ W} \end{aligned}$$

Q3.

*Solution:* The equivalent circuit is



Applying nodal analysis at V:

$$\begin{aligned}
 &= \frac{V - 100}{14} + \frac{V}{2} + \frac{V - 40}{1} = 0 \\
 &V - 100 + 7V + 14V - 560 = 0 \\
 &V = \frac{660}{22} = 30 \text{ V}
 \end{aligned}$$

Current through  $14 \Omega$  and  $1 \Omega$  resistors

$$\begin{aligned}
 I_2 &= \frac{100 - 30}{14} = \frac{70}{14} = 5 \text{ A} \\
 I_1 &= \frac{40 - 30}{1} = 10 \text{ A}
 \end{aligned}$$

Therefore, current through  $R$  is  $5 \text{ A}$  (as  $10 = 5 + 5$ )

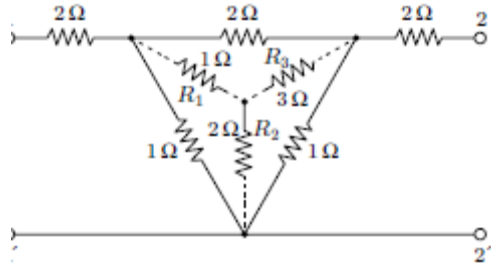
So,

$$\frac{100 - 40}{R} = 5$$

$$R = \frac{60}{5} = 12 \Omega$$

Q4.

*Solution.* Using Delta-Wye transformation, the conversion circuit is as shown in the following figure:



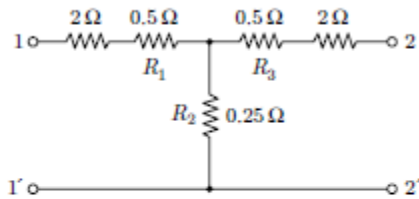
Therefore,

$$R_1 = \frac{2 \times 1}{4} = \frac{2}{4} = 0.5$$

$$R_2 = \frac{1 \times 1}{4} = \frac{1}{4} = 0.25$$

$$R_3 = \frac{2 \times 1}{4} = 0.5$$

The equivalent circuit is shown in the following figure:



The impedance matrix is given by

$$\begin{bmatrix} R_1 + R_2 + 2 & R_3 \\ R_3 & R_2 + R_3 \end{bmatrix}$$

Therefore,

$$Z_{11} = R_1 + R_2 + 2 = 0.5 + 0.25 + 2 = 2.75 \Omega$$

and  $Z_{12} = R_3 = 0.25 \Omega$

Q.9

*Solution.* For the lattice network, Z-parameter matrix is given as

$$Z = \begin{bmatrix} \frac{Z_a + Z_b}{2} & \frac{Z_a - Z_b}{2} \\ \frac{Z_a - Z_b}{2} & \frac{Z_a + Z_b}{2} \end{bmatrix}$$

where

$$Z_a = 2j$$

$$Z_b = 2\Omega$$

Therefore,

$$Z = \begin{bmatrix} 1+j & j-1 \\ j-1 & 1+j \end{bmatrix}$$

Q10.

*Solution.* The  $h$ -parameters can be calculated using the formula

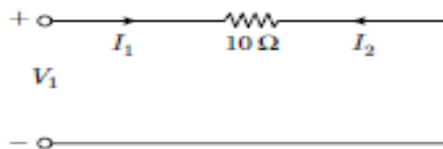
$$h_{11} = \left. \frac{V_1}{I_1} \right|_{V_2=0}$$

$$h_{12} = \left. \frac{V_1}{V_2} \right|_{I_1=0}$$

$$h_{21} = \left. \frac{I_2}{I_1} \right|_{V_2=0}$$

$$h_{22} = \left. \frac{I_2}{V_2} \right|_{I_1=0}$$

When  $V_2 = 0$ , the circuit can be redrawn as shown in the following figure:



From this figure, we can see that  $I_1 = -I_2$  and  $V_1 = 10I_1$ . Therefore,

$$h_{21} = \frac{I_2}{I_1} = -1$$

and  $h_{11} = \frac{V_1}{I_1} = 10$

When  $I_1 = 0$ , then  $V_1 = V_2$  since there is no drop in  $10 \Omega$  resistance. Therefore,

$$h_{12} = \frac{V_1}{V_2} = 1$$

Also,

$$V_2 = 20I_2$$

Therefore,

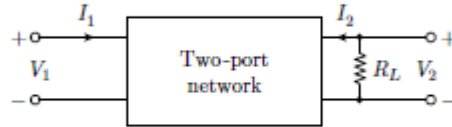
$$h_{22} = \frac{I_2}{V_2} = \frac{1}{20} = 0.05$$

The  $h$ -parameter matrix is given by

$$\begin{bmatrix} 10 & 1 \\ -1 & 0.05 \end{bmatrix}$$

Q11.

*Solution.* The following figure shows the two-port network terminated by resistance  $R_L$ :



The voltages and currents of the network can be expressed in terms of  $A$ ,  $B$ ,  $C$  and  $D$  parameters as

$$V_1 = AV_2 - BI_2 \quad \text{and} \quad I_1 = CV_2 - DI_2$$

Now,

$$V_2 = -I_2 R_L$$

Therefore,

$$\frac{V_1}{I_1} = \frac{AV_2 - BI_2}{CV_2 - DI_2} = \frac{-AI_2 R_L - BI_2}{-CI_2 R_L - DI_2}$$

The input impedance is

$$\frac{V_1}{I_1} = \frac{AR_L + B}{CR_L + D}$$

**SLOW LEARNER ASSIGNMENT**

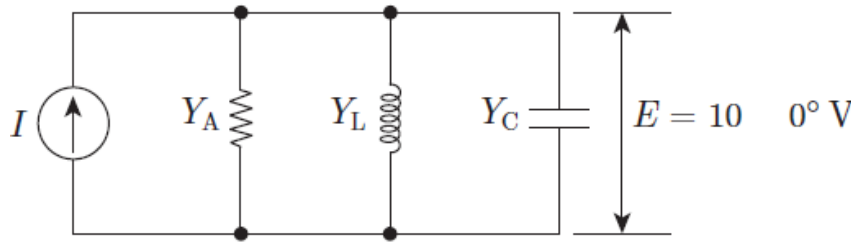
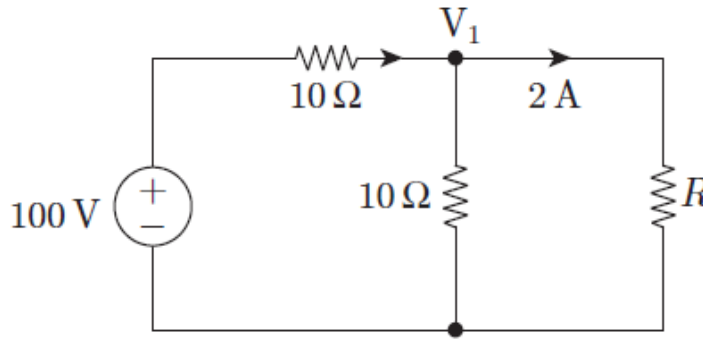
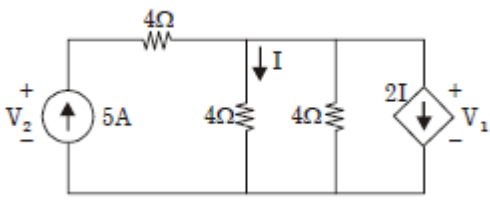
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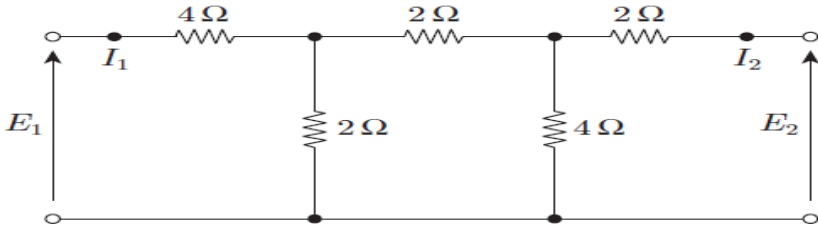
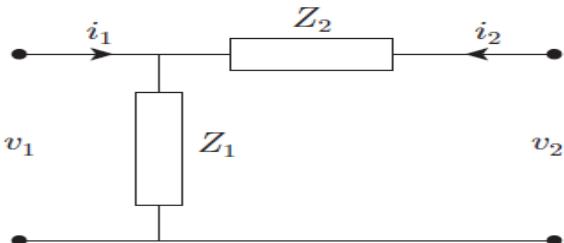
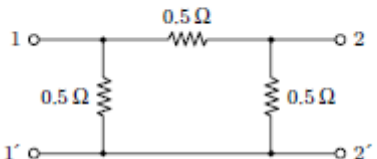
<b>COURSE : B. Tech (II Year)</b>	<b>SEMESTER: III</b>	<b>SECTION: A</b>
<b>SUBJECT: NETWORK THEORY (3EC04-06)</b>		<b>Session: 2019-20</b>
<b>Faculty Name: RAJ KUMAR JAIN (AP)</b>	<b>DOA: 30-09-2019</b>	<b>DOS: 03-10-2019</b>

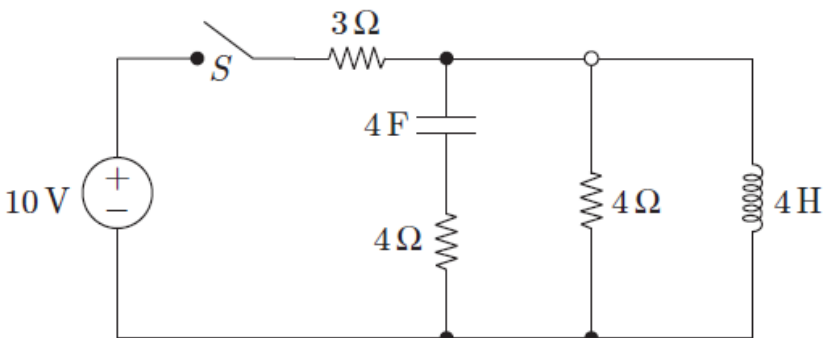
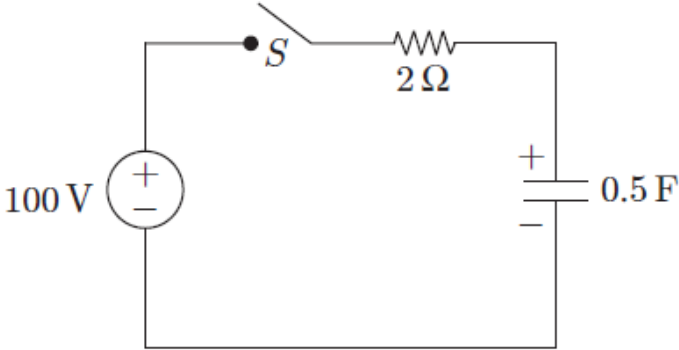
**ASSIGNMENT NO. 4(CO1,CO2 ,CO3 & CO4)**

- CO1: Apply the basic circuit law and simplify the network using network theorems.
- CO2: Appreciate the frequency domain techniques in different applications.
- CO3: Apply Laplace Transform for steady state and transient analysis.
- CO4: Evaluate transient response and two-port network parameters.

Q.1/CO1	<p>In the figure given below, the value of the source voltage is</p>	N	GATE 2004
Q.2/CO1	<p>. In the figure given below, the admittance values of the elements in Siemens are <math>Y_R = 0.5 + 0j</math>, <math>Y_L = 0 - 1.5j</math>, <math>Y_C = 0 + 0.3j</math>, respectively. The value of <math>I</math> as a phasor when the voltage <math>E</math> across the elements is <math>10\angle 10^\circ</math> V is</p>	N	GATE 2004

			
Q.3/CO1	<p>In the figure given below, the value of resistance <math>R</math> in <math>\Omega</math> is</p> 	N	GATE 2004
Q.4/CO2	<p>In the given circuit, the values of <math>V_1</math> and <math>V_2</math> respectively are</p> 	N	GATE 2015
Q.5/CO2	<p>If <math>v(t) = 10 + 6 \cos(t + 45^\circ) + 1.8 \cos(2t - 10^\circ)</math> volt and <math>i(t) = 3 + 1.4 \cos(t + 20^\circ) + 0.5 \cos 2t</math> mA, calculate the average power in Watt. Determine also the effective voltage and effective current.</p>	N	RTU 2013
Q.6/CO2	<p>Determine the expression for current in an impedance of <math>R = 10</math> ohm, <math>L = 0.0318</math> H with applied emf, <math>e(t) = 200 \sin 314t + 40 \sin(942t + 30^\circ) + 10</math> V Also, calculate the rms value of voltage and current as well as the power factor of the circuit.</p>	N	RTU 2012

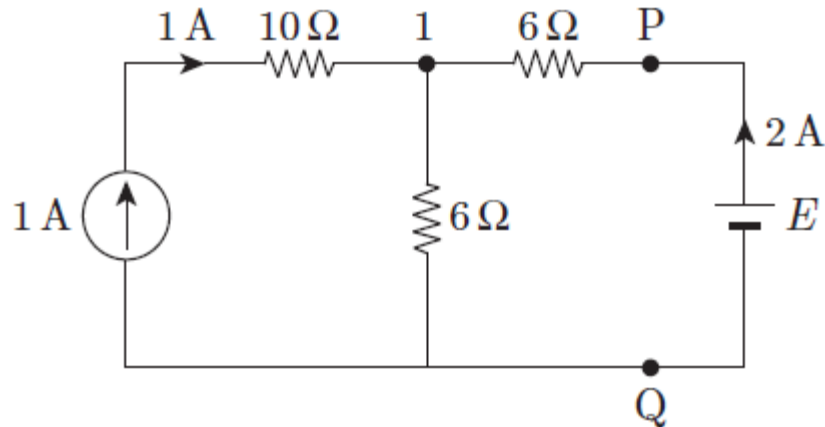
Q.7/C04	<p><b>9.</b> The <math>h</math>-parameters for a two-port network are defined by <math>\begin{bmatrix} E_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} h_{11} &amp; h_{12} \\ h_{21} &amp; h_{22} \end{bmatrix} \begin{bmatrix} I_1 \\ E_2 \end{bmatrix}</math></p> <p>For the two-port network shown in the figure given below, the value of <math>h_{12}</math> is given by</p> 	N	GATE 2003
Q.8/C04	<p>For the two-port network shown in the figure given below, the <math>Z</math>-matrix is given by</p> 	N	RTU 2005
Q.9/C04	<p>For the two-port network shown in the following figure, the short-circuit admittance parameter matrix is</p>  <p>(a) <math>\begin{bmatrix} 4 &amp; -2 \\ -2 &amp; 4 \end{bmatrix}</math> S      (b) <math>\begin{bmatrix} 1 &amp; -0.5 \\ -0.5 &amp; 1 \end{bmatrix}</math> S</p> <p>(c) <math>\begin{bmatrix} 1 &amp; 0.5 \\ 0.5 &amp; 1 \end{bmatrix}</math> S      (d) <math>\begin{bmatrix} 4 &amp; 2 \\ 2 &amp; 4 \end{bmatrix}</math> S</p>	N	GATE 2010

Q.10/CO3	<p>8. In the circuit shown in the figure given below, the switch <math>S</math> is closed at time <math>t = 0</math>. The voltage across the inductance at <math>t = 0^+</math>, is</p> 	N	GATE 2003
Q.11/CO3	<p>In the figure given below, the capacitor initially has a charge of 10 Coulombs. The current in the circuit one second after the switch <math>S</math> is closed will be</p> 	N	GATE 2004

ASSIGNMENT 4 SOLUTION

Q.1

*Solution:* The equivalent circuit is



At node 1,  $V_1 = (2 + 1) \times 6 = 18 \text{ V}$

By nodal analysis,

$$\frac{E - V_1}{6} = 2$$

$$E - 18 = 12 \Rightarrow E = 30 \text{ V}$$

Q.2

*Solution:* We have

$$I = \frac{E}{Z_{\text{eq}}}, Z_{\text{eq}} = \frac{1}{Y_{\text{eq}}} \Rightarrow I = E \cdot Y_{\text{eq}}$$

$$Y_{\text{eq}} = Y_R + Y_L + Y_C$$

$$= (0.5 + 0j) + (0 - 1.5j) + (0 + 0.3j)$$

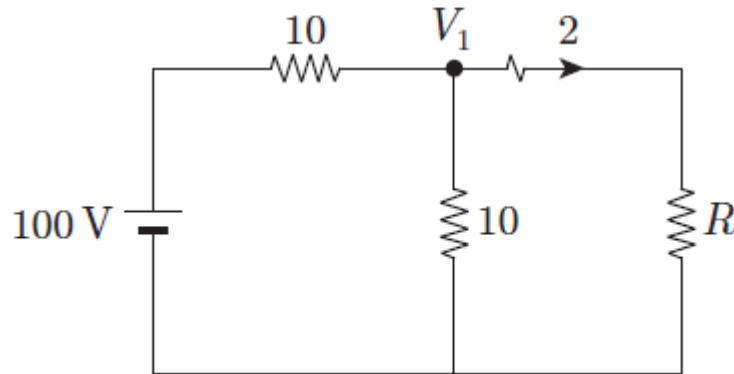
$$= 0.5 - 1.2j$$

$$\Rightarrow I = 10(0.5 - 1.2j) = 5 - 12j$$

Q3.

*Solution:* Current through  $R \Omega$  resistor = 2 A.

$$I = \frac{V_1}{R} \Rightarrow 2 = \frac{V_1}{R} \quad (\text{i})$$



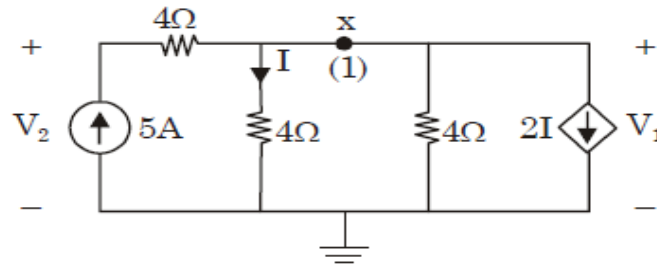
At node  $V_1$ ,

$$V_1 = \frac{100}{10 + \left(\frac{10R}{10 + R}\right)} \times \left(\frac{10R}{10 + R}\right) = \frac{50R}{5 + R} \quad (\text{ii})$$

Therefore, from Eq. (i)

$$\begin{aligned} R &= \frac{50R}{2} \Rightarrow \frac{50}{5 + R} = 2 \\ 50 &= 10 + 2R \\ \Rightarrow R &= 20 \Omega \end{aligned}$$

Q4.



Applying nodal analysis at node (1), we get

$$5 = \frac{x}{4} + \frac{x}{4} + 2I$$

$$\Rightarrow 5 = \frac{2x}{4} + 2 \times \frac{x}{4} \quad [\because x = 4I]$$

$$\therefore x = 5$$

$$\text{Now, } V_1 = 5V \quad [\because x = V_1]$$

$$V_1 + 5 \times 4 - V_2 = 0$$

[KVL in the outermost loop]

$$\Rightarrow V_2 = 5 + 5 \times 4 = 25 \text{ V}$$

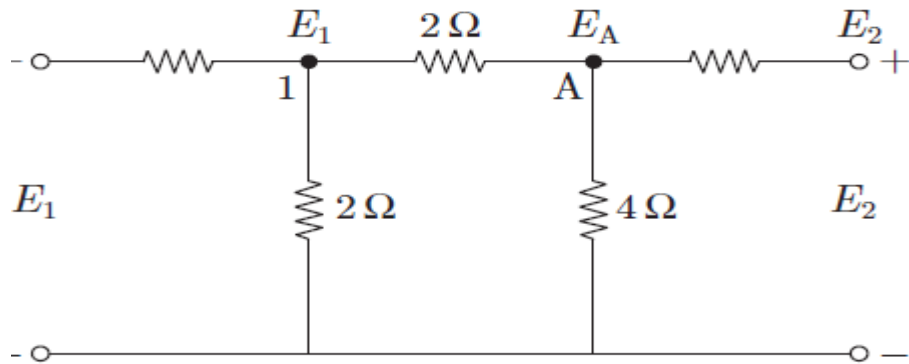
Q7.

*Solution:* Given

$$\begin{bmatrix} E_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{bmatrix} \begin{bmatrix} I_1 \\ E_2 \end{bmatrix} \Rightarrow \begin{aligned} E_1 &= I_1 h_{11} + E_2 h_{12} \\ I_2 &= I_1 h_{21} + E_2 h_{22} \end{aligned}$$

$$h_{12} = \left. \frac{E_1}{E_2} \right|_{I_1 = 0}$$

as for an open circuit  $I_1 = 0$ .



Applying KVL at node A,

$$\frac{E_A - E_1}{2} + \frac{E_A - E_2}{2} + \frac{E_A}{4} = 0$$

$$5E_A - 2E_1 - 2E_2 = 0 \quad (i)$$

Similarly at node 1

$$\frac{E_1 - E_A}{2} + \frac{E_1}{2} = 0 \quad 2E_1 - E_A = 0$$

$$\Rightarrow E_A = 2E_1 \quad (ii)$$

Solving Eqs. (ii) and (i), we get

$$5(2E_1) - 2E_1 - 2E_2 = 0$$

$$8E_1 = 2E_2 \Rightarrow \frac{E_1}{E_2} = \frac{2}{8} = \frac{1}{4}$$

Q8.

*Solution:* Apply Kirchhoff's voltage law, we have,

Loop 1:  $v_1 - (i_1 + i_2)Z_1 = 0$

$$v_1 = Z_1 i_1 + Z_1 i_2 \quad (i)$$

Loop 2:  $v_2 - i_2 Z_2 - (i_1 + i_2)Z_1 = 0$

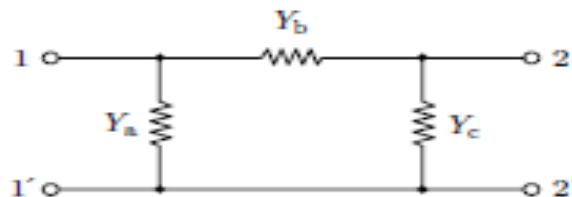
$$v_2 = Z_1 i_1 + (Z_1 + Z_2) i_2 \quad (ii)$$

Therefore, Z-matrix,  $Z = \begin{bmatrix} Z_1 & Z_1 \\ Z_1 & Z_1 + Z_2 \end{bmatrix}$

Q9.

*Solution.* Short-circuit admittance parameters for a two port  $\pi$ -network shown in the following figure are

$$\begin{aligned} Y_{11} &= Y_a + Y_b \\ Y_{12} &= Y_{21} = -Y_b \\ Y_{22} &= Y_b + Y_c \end{aligned}$$



For the given network,

$$Y_a = Y_b = Y_c = \frac{1}{0.5} = 2S$$

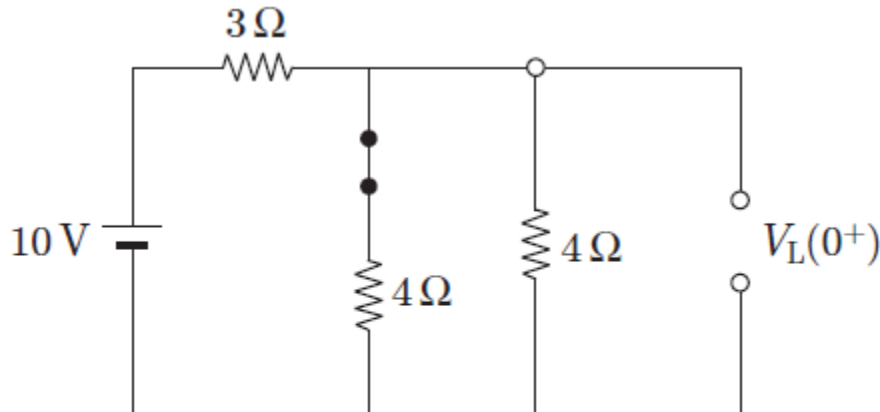
Therefore,

$$\begin{aligned} Y_{11} &= 2 + 2 = 4S \\ Y_{12} &= Y_{21} = -2S \\ Y_{22} &= 2 + 2 = 4S \end{aligned}$$

Therefore, the short-circuit admittance matrix is

$$\begin{bmatrix} 4 & -2 \\ -2 & 4 \end{bmatrix} S$$

Q10.



$$V_L(0^+) = \frac{10}{3 + \left(\frac{4 \times 4}{4 + 4}\right)} \times \left(\frac{4 \times 4}{4 + 4}\right) = \frac{10}{3 + 2} \times 2 = 4 \text{ V}$$

Q11.

*Solution:* Let  $V_C(0)$  is the initial voltage across capacitor,  $Q_0$  is the corresponding charge at  $V_C$  and  $V_C(\infty)$  is the voltage when switch is closed.

$$Q_0 = CV_C(0)$$

$$10 = 0.5 V_C(0) \Rightarrow V_C(0) = 20 \text{ V}$$

$$V_C(\infty) = 100 \text{ V}$$

The transient response,

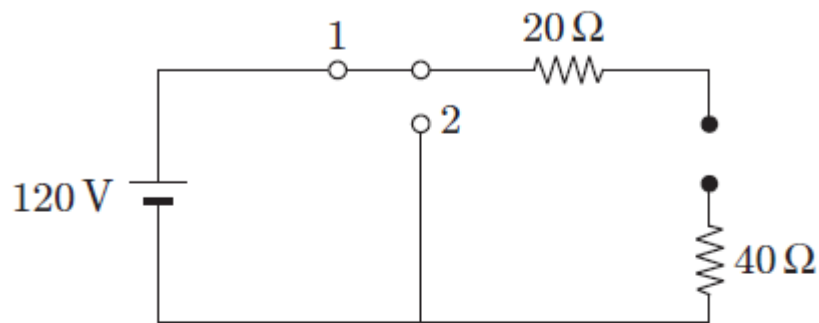
$$\begin{aligned} V_C(t) &= V_C(\infty) + [V_C(0) - V_C(\infty)]e^{-t/RC} \\ &= 100 + (20 - 100)e^{-t/2 \times 0.5} \\ &= 100 - 80 \cdot e^{-t/1} \end{aligned}$$

$$\begin{aligned} i_C(t) &= C \cdot \frac{dV_C(t)}{dt} = C \cdot \frac{d}{dt}[100 - 80e^{-t}] \\ &= 0.5[+80e^{-t}] = 40e^{-t} \end{aligned}$$

$$\text{At } t = 1 \text{ s, } i(t) = 40e^{-1} = 14.71 \text{ A}$$

Q12.

*Solution:*



$$\begin{aligned}i_L(0^-) &= \frac{\text{Total voltage}}{\text{Sum of resistance}} \\ &= \frac{120}{20 + 40} = 2 \text{ A} \quad \text{[Position 1]}\end{aligned}$$

In the inductor, the current does not change simultaneously. Therefore,

$$i_L(0^+) = i_L(0^-) = 2 \text{ A} \quad \text{[Position 2].}$$

Voltage across the inductor at  $t = 0^+$

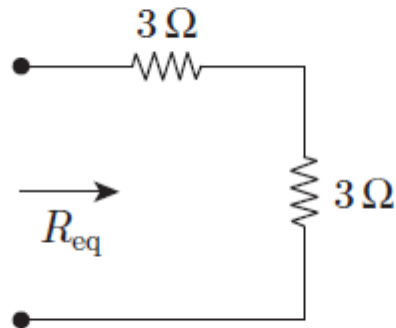
$$V_L(0^+) = 120 \text{ V}$$

By applying KVL,

$$120 = 2(40 + R + 20) \Rightarrow R = 0 \Omega$$

Q13.

*Solution:* Overall time constant  $T = C_{eq}R_{eq}$ .  
Equivalent resistance is



$$R_{eq} = 3 + 3 = 6 \quad (\text{series connection})$$

Equivalent capacitance is obtained by eliminating two parallel capacitances, each of 1 F.

$$C_{eq} = 1 + 1 = 2\ \text{F}$$

Elimination a series connection of 2 F with 1 F

$$C_{eq} = \frac{2 \times 1}{2 + 1} = \frac{2}{3}\ \text{F}$$

So, the time constant is  $T = 6 \times \frac{2}{3} = 4\ \text{s}$

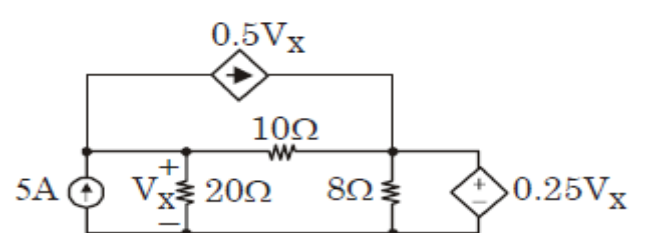
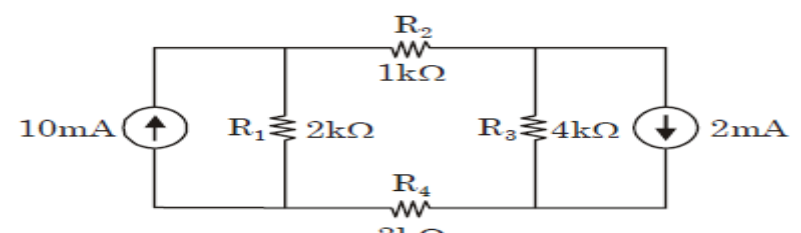
**SLOW LEARNER ASSIGNMENT**

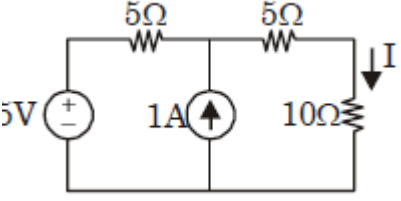
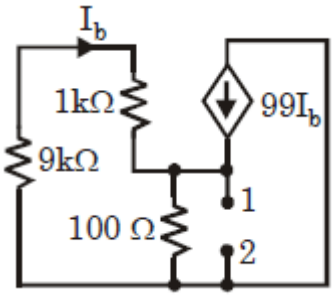
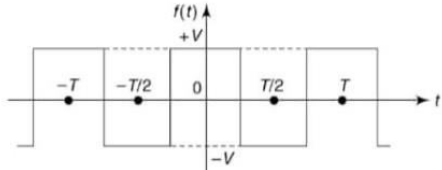
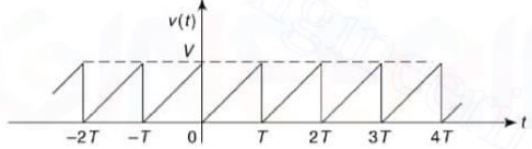
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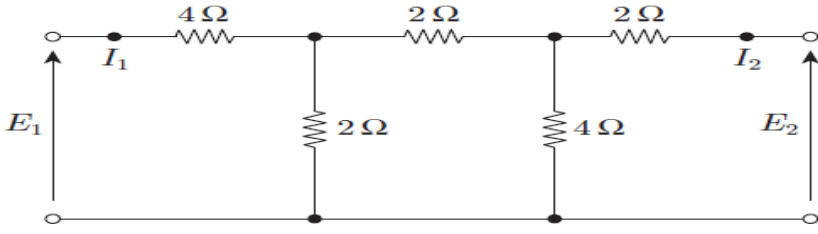
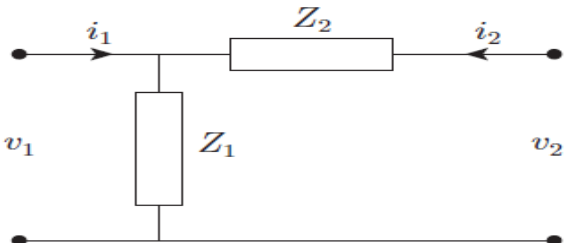
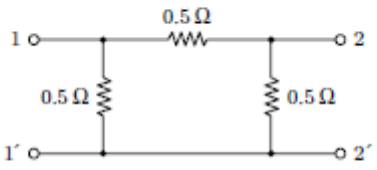
<b>COURSE : B. Tech (II Year)</b>	<b>SEMESTER: III</b>	<b>SECTION: A</b>
<b>SUBJECT: NETWORK THEORY(3EC04-06)</b>		<b>Session: 2019-20</b>
<b>Faculty Name: RAJ KUMAR JAIN (AP)</b>	<b>DOA: 22-11-2019</b>	<b>DOS: 25-11-2019</b>

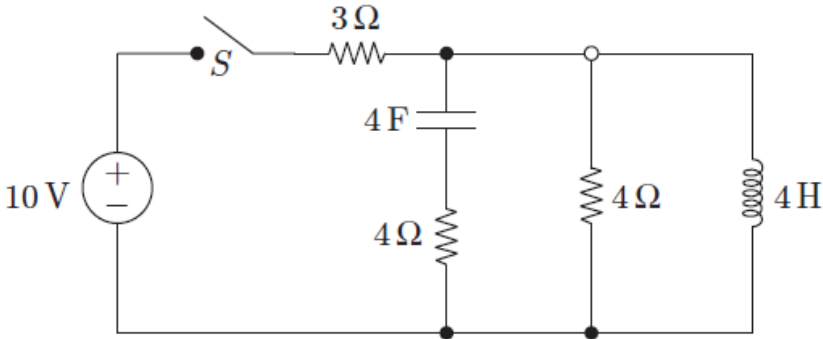
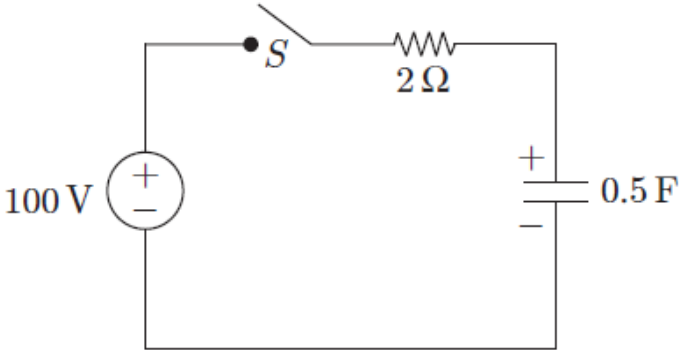
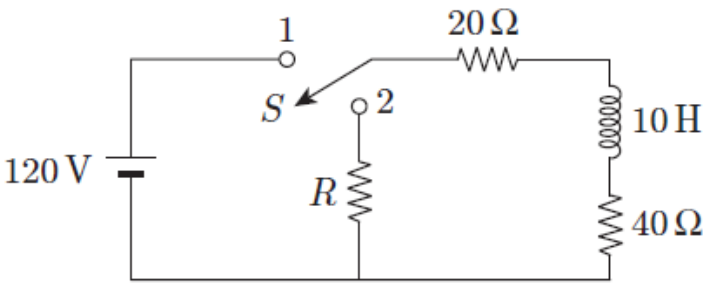
**WEEK STUDENT ASSIGNMENT NO. 5**

- CO1: Apply the basic circuit law and simplify the network using network theorems.
- CO2: Appreciate the frequency domain techniques in different applications.
- CO3: Apply Laplace Transform for steady state and transient analysis.
- CO4: Evaluate transient response and two-port network parameters.
- CO5: Analyze the series resonant and parallel resonant circuit and design filters.

Q.1/CO1	<p>In the circuit shown, the voltage <math>V_x</math> (in Volts) is ____</p> 	N	GATE 2015
Q.2/CO1	<p>The magnitude of current (in mA) through the resistor <math>R_2</math> in the figure shown is ____.</p> 	N	GATE 2014

<p>Q.3/CO1</p>	<p>. In the figure shown, the value of the current I (in Amperes) is _____. I</p> 	<p>N</p>	<p>GATE 2014</p>
<p>Q.4/CO1</p>	<p>The impedance looking into nodes 1 and 2 in the given circuit is</p> 	<p>N</p>	<p>GATE 2012</p>
<p>Q.5/CO2</p>	<p>Determine the Fourier series for the square waveform shown below and plot the magnitude and the phase spectra.</p> 	<p>N</p>	<p>RTU 2016</p>
<p>Q.6/CO2</p>	<p>The waveform shown in the following figure is used as 'sweep' in radar and television circuits. Find the Fourier series and plot the line spectra.</p> 	<p>N</p>	<p>RTU 2017</p>

Q.7/C04	<p>9. The <math>h</math>-parameters for a two-port network are defined by <math>\begin{bmatrix} E_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} h_{11} &amp; h_{12} \\ h_{21} &amp; h_{22} \end{bmatrix} \begin{bmatrix} I_1 \\ E_2 \end{bmatrix}</math></p> <p>For the two-port network shown in the figure given below, the value of <math>h_{12}</math> is given by</p> 	N	GATE 2003
Q.8/C04	<p>For the two-port network shown in the figure given below, the <math>Z</math>-matrix is given by</p> 	N	RTU 2005
Q.9/C04	<p>For the two-port network shown in the following figure, the short-circuit admittance parameter matrix is</p>  <p>(a) <math>\begin{bmatrix} 4 &amp; -2 \\ -2 &amp; 4 \end{bmatrix}</math> S      (b) <math>\begin{bmatrix} 1 &amp; -0.5 \\ -0.5 &amp; 1 \end{bmatrix}</math> S</p> <p>(c) <math>\begin{bmatrix} 1 &amp; 0.5 \\ 0.5 &amp; 1 \end{bmatrix}</math> S      (d) <math>\begin{bmatrix} 4 &amp; 2 \\ 2 &amp; 4 \end{bmatrix}</math> S</p>	N	GATE 2010

Q.10/CO3	<p>8. In the circuit shown in the figure given below, the switch <math>S</math> is closed at time <math>t = 0</math>. The voltage across the inductance at <math>t = 0^+</math>, is</p> 	N	GATE 2003
Q.11/CO3	<p>In the figure given below, the capacitor initially has a charge of 10 Coulombs. The current in the circuit one second after the switch <math>S</math> is closed will be</p> 	N	GATE 2004
Q.12/CO3	<p>If, at <math>t = 0^+</math>, the voltage across the coil is 120 V, the value of resistance <math>R</math> is</p> 	N	GATE 2005

Q.13/CO3	<p>The time constant for the given circuit will be</p> <div style="text-align: center;"> </div> <p>(a) <math>\frac{1}{9}</math> s                      (b) <math>\frac{1}{4}</math> s (c) 4 s                              (d) 9 s</p>	N	GATE 2008
Q.14/CO5	<p>11. The rms value of the periodic waveform given in the following figure is</p> <div style="text-align: center;"> </div>	N	GATE 2004
Q.15/CO5	<p>A 240 V, 100 Hz AC source supplies a series RLC circuit consisting of a capacitor and a coil. If the coil has 55 mΩ resistance and 7 mH inductance. Calculate – [2×5=10]</p> <p>(i) The value of the capacitor at 100 Hz resonance frequency (ii) The Q – factor (iii) The hay power frequencies of the circuit (iv) Input current at resonance (v) Maximum instantaneous energy stored in the inductor</p>	N	RTU 2018
Q.16/CO5	<p><b>Write a short note on types of Filters.</b></p>	N	RTU 2018

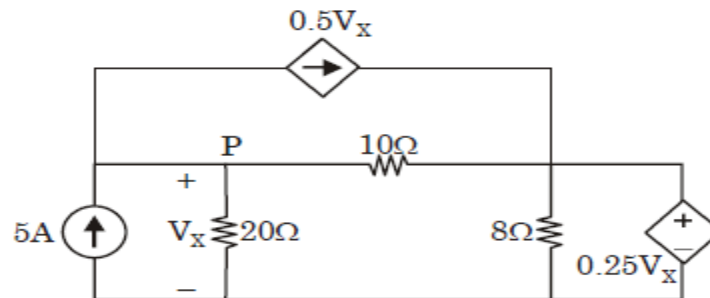
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Q.17/CO5	A coil of resistance $2.2 \Omega$ and inductance $0.01 \text{ H}$ is connected in series with a capacitor across $220 \text{ V}$ mains. Find the value of capacitance such that the maximum current flows in the circuit at a frequency of $100 \text{ Hz}$ . Also, find the current and voltage across the capacitor.	N	RTU 2012EE
Q.18/CO5	1. A series <i>RLC</i> circuit has the values: $R = 10 \Omega$ , $L = 0.01 \text{ H}$ , $C = 100 \mu\text{F}$ . Calculate resonant frequency, quality factor, bandwidth, and the half-power frequencies.	N	RTU2011 EE

ASSIGNMENT 5 SOLUTION

Q1. SOL.



Apply KCL at point P

$$\frac{V_x}{20} + \frac{V_x - 0.25V_x}{10} + 0.5V_x = 5$$

$$V_x \left( \frac{1}{20} + \frac{75}{1000} + \frac{1}{2} \right) = 5$$

$$V_x \left( \frac{1}{20} + \frac{3}{40} + \frac{1}{2} \right) = 5$$

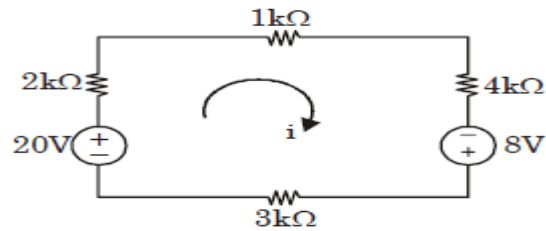
$$V_x \left( \frac{2+3+20}{40} \right) = 5$$

$$V_x \left( \frac{5}{8} \right) = 5$$

$$\therefore V_x = 8 \text{ Volts}$$

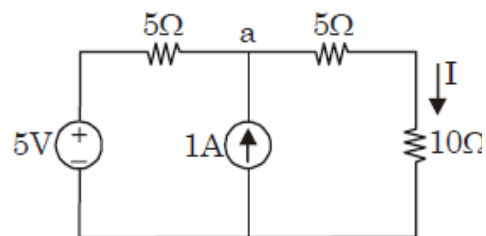
Q2.

Transforming current sources into voltage sources, we get



$$i = \frac{20 + 8}{(2 + 1 + 4 + 3)k} = 2.8 \text{ mA}$$

Q3.



Applying KCL at node a,

$$\frac{V_a - 5}{5} + \frac{V_a}{15} - 1 = 0$$

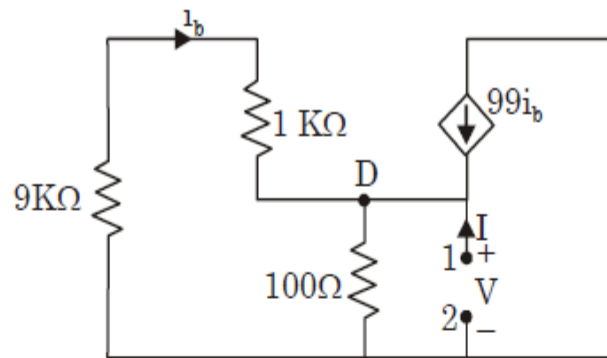
$$3(V_a - 5) + V_a = 15$$

$$4V_a = 30$$

$$V_a = 7.5V$$

$$\therefore I = \frac{V_a}{15} = \frac{7.5}{15} = 0.5A$$

Q4.



Let voltage across 1, 2 is  $V$  and current through it is  $I$ .

$$V = -i_b(9000 + 1000)$$

$$V = -10000i_b$$

Applying KCL at point D

$$i_b + I + 99i_b = \frac{V}{100}$$

$$I - \frac{V}{100} = \frac{V}{100}$$

$$I = \frac{V}{50}$$

And the impedance equivalent will be given by

$$\frac{V}{I} = Z = 50 \Omega$$

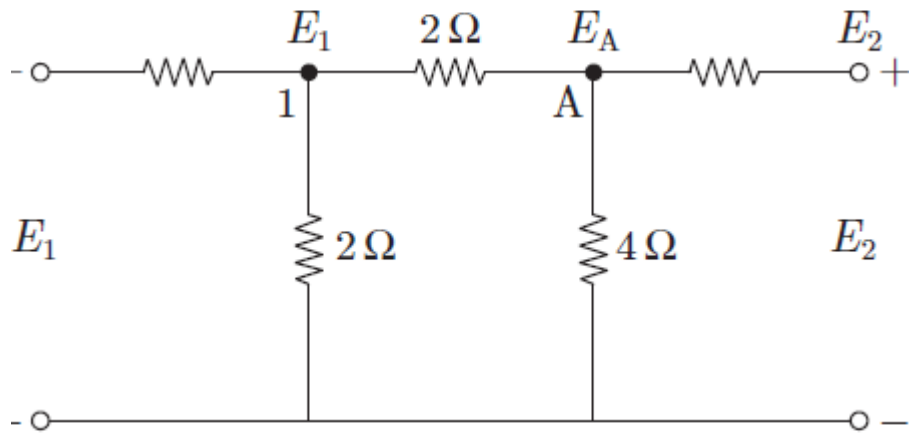
Q7.

*Solution:* Given

$$\begin{bmatrix} E_1 \\ I_2 \end{bmatrix} = \begin{bmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{bmatrix} \begin{bmatrix} I_1 \\ E_2 \end{bmatrix} \Rightarrow \begin{aligned} E_1 &= I_1 h_{11} + E_2 h_{12} \\ I_2 &= I_1 h_{21} + E_2 h_{22} \end{aligned}$$

$$h_{12} = \left. \frac{E_1}{E_2} \right|$$

as for an open circuit  $I_1 = 0$ .



Applying KVL at node A,

$$\frac{E_A - E_1}{2} + \frac{E_A - E_2}{2} + \frac{E_A}{4} = 0$$

$$5E_A - 2E_1 - 2E_2 = 0 \quad (i)$$

Similarly at node 1

$$\frac{E_1 - E_A}{2} + \frac{E_1}{2} = 0 \quad 2E_1 - E_A = 0$$
$$\Rightarrow E_A = 2E_1 \quad (ii)$$

Solving Eqs. (ii) and (i), we get

$$5(2E_1) - 2E_1 - 2E_2 = 0$$
$$8E_1 = 2E_2 \Rightarrow \frac{E_1}{E_2} = \frac{2}{8} = \frac{1}{4}$$

Q8.

*Solution:* Apply Kirchhoff's voltage law, we have,

Loop 1:  $v_1 - (i_1 + i_2)Z_1 = 0$

$$v_1 = Z_1 i_1 + Z_1 i_2 \quad (i)$$

Loop 2:  $v_2 - i_2 Z_2 - (i_1 + i_2)Z_1 = 0$

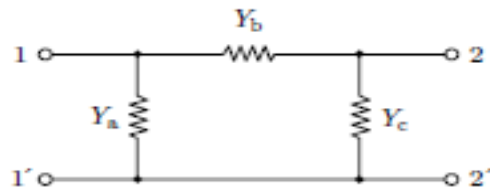
$$v_2 = Z_1 i_1 + (Z_1 + Z_2) i_2 \quad (ii)$$

Therefore, Z-matrix,  $Z = \begin{bmatrix} Z_1 & Z_1 \\ Z_1 & Z_1 + Z_2 \end{bmatrix}$

Q9.

*Solution.* Short-circuit admittance parameters for a two port  $\pi$ -network shown in the following figure are

$$\begin{aligned} Y_{11} &= Y_a + Y_b \\ Y_{12} &= Y_{21} = -Y_b \\ Y_{22} &= Y_b + Y_c \end{aligned}$$



For the given network,

$$Y_a = Y_b = Y_c = \frac{1}{0.5} = 2S$$

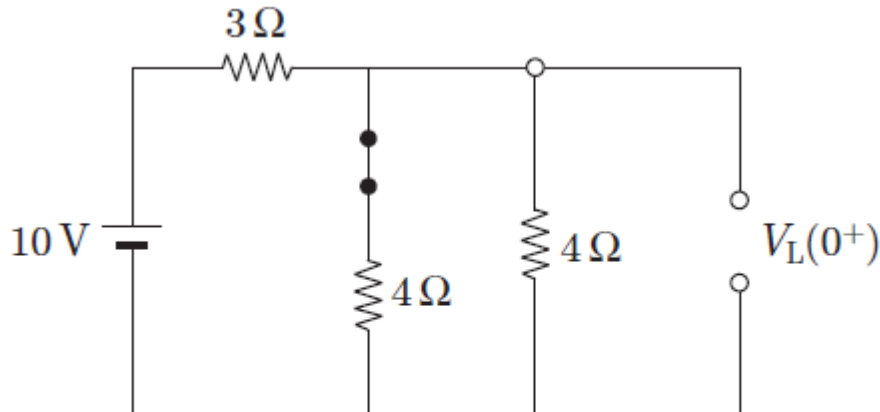
Therefore,

$$\begin{aligned} Y_{11} &= 2 + 2 = 4S \\ Y_{12} &= Y_{21} = -2S \\ Y_{22} &= 2 + 2 = 4S \end{aligned}$$

Therefore, the short-circuit admittance matrix is

$$\begin{bmatrix} 4 & -2 \\ -2 & 4 \end{bmatrix} S$$

Q10.



$$V_L(0^+) = \frac{10}{3 + \left(\frac{4 \times 4}{4 + 4}\right)} \times \left(\frac{4 \times 4}{4 + 4}\right) = \frac{10}{3 + 2} \times 2 = 4 \text{ V}$$

Q11.

*Solution:* Let  $V_C(0)$  is the initial voltage across capacitor,  $Q_0$  is the corresponding charge at  $V_C$  and  $V_C(\infty)$  is the voltage when switch is closed.

$$Q_0 = CV_C(0)$$

$$10 = 0.5 V_C(0) \Rightarrow V_C(0) = 20 \text{ V}$$

$$V_C(\infty) = 100 \text{ V}$$

The transient response,

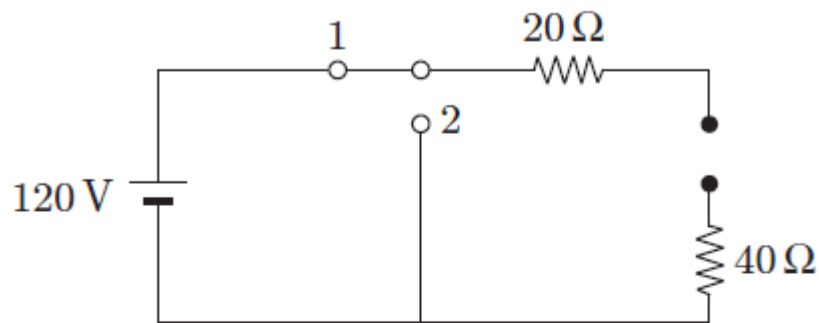
$$\begin{aligned} V_C(t) &= V_C(\infty) + [V_C(0) - V_C(\infty)]e^{-t/RC} \\ &= 100 + (20 - 100)e^{-t/2 \times 0.5} \\ &= 100 - 80 \cdot e^{-t/1} \end{aligned}$$

$$\begin{aligned} i_C(t) &= C \cdot \frac{dV_C(t)}{dt} = C \cdot \frac{d}{dt}[100 - 80e^{-t}] \\ &= 0.5[+80e^{-t}] = 40e^{-t} \end{aligned}$$

$$\text{At } t = 1 \text{ s, } i(t) = 40e^{-1} = 14.71 \text{ A}$$

Q12.

*Solution:*



$$\begin{aligned} i_L(0^-) &= \frac{\text{Total voltage}}{\text{Sum of resistance}} \\ &= \frac{120}{20 + 40} = 2 \text{ A} \quad [\text{Position 1}] \end{aligned}$$

In the inductor, the current does not change simultaneously. Therefore,

$$i_L(0^+) = i_L(0^-) = 2 \text{ A} \quad [\text{Position 2}].$$

Voltage across the inductor at  $t = 0^+$

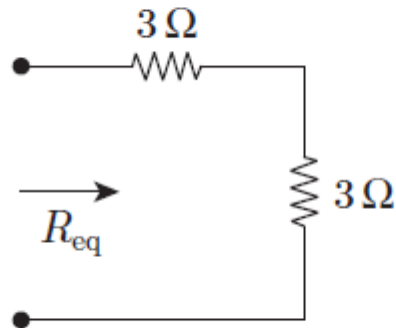
$$V_L(0^+) = 120 \text{ V}$$

By applying KVL,

$$120 = 2(40 + R + 20) \Rightarrow R = 0 \text{ } \Omega$$

Q13.

*Solution:* Overall time constant  $T = C_{eq}R_{eq}$ .  
Equivalent resistance is



$$R_{eq} = 3 + 3 = 6 \quad (\text{series connection})$$

Equivalent capacitance is obtained by eliminating two parallel capacitances, each of 1 F.

$$C_{eq} = 1 + 1 = 2\ \text{F}$$

Elimination a series connection of 2 F with 1 F

$$C_{eq} = \frac{2 \times 1}{2 + 1} = \frac{2}{3}\ \text{F}$$

So, the time constant is  $T = 6 \times \frac{2}{3} = 4\ \text{s}$

**Student mentor List 3 Sem Section A**

<b>STUDENT ROLL NUMBER</b>	<b>NAME OF MENTOR</b>
1 TO 20	MR. RAJ KUMAR JAIN
21 TO 40	DR. RAJESH BATHIJA
41 TO 55	MS.RITU VYAS

**NOTICE**

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/01

Date: 23/07/2019

This is to inform all the following students of 3rd semester section-A that a special lecture of Network Theory is to be held tomorrow at 4 P.M. in LT-14 as an improvement measure for CO1. The lecture will include the core of theory along with numerical solving and doubt resolving sessions. It is compulsory to attend the following students to attend and if any other student wish to attend the same, may also come.

**List of Slow Learners**

S. No.	Sec.	Roll No.	Name of Student
1.	A	18EJCEC008	AJAY KUMAR MEENA
2.	A	18EJCEC010	AKSHAT SHARMA
3.	A	18EJCEC011	AKSHAT TODI
4.	A	18EJCEC016	AMIT KUMAR CHHIPA
5.	A	18EJCEC017	ANCHAL MADNANI
6.	A	18EJCEC026	ASHISH JANGID
7.	A	18EJCEC029	ASHISH YADAV
8.	A	18EJCEC031	ASHUTOSH KAUSHIK
9.	A	18EJCEC036	ATUL KUMAR AGRAWAL
10.	A	18EJCEC037	AYUSH KUMAR
11.	A	18EJCEC039	AYUSHI PRAJAPATI
12.	A	18EJCEC042	CHARUL BHATI
13.	A	18EJCEC045	DARSHAN NAHATA

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RAJ KUMAR JAIN

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SUBJECT TEACHER

Exam cell, EC dept.

CC SECTION A

**NOTICE**

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/02

Date: 13/08/2019

This is to inform all the following students of 3rd semester section-A that a special lecture of Network Theory is to be held tomorrow at 4 P.M. in LT-14 as an improvement measure for C01 & CO2. The lecture will include the core of theory along with numerical solving and doubt resolving sessions. It is compulsory to attend the following students to attend and if any other student wish to attend the same, may also come.

**List of Slow Learners**

Sr.	Sec.	Roll No.	Name of Student
1.	A	18EJCEC001	AAKASH CHAMOLI
2.	A	18EJCEC003	ABHINAV DADHICH
3.	A	18EJCEC007	ADITYA YADAV
4.	A	18EJCEC009	AKASH ARORA
5.	A	18EJCEC010	AKSHAT SHARMA
6.	A	18EJCEC011	AKSHAT TODI
7.	A	18EJCEC012	AKSHAY KUMAR BENIWAL
8.	A	18EJCEC017	ANCHAL MADNANI
9.	A	18EJCEC026	ASHISH JANGID
10.	A	18EJCEC027	ASHISH MANGAL
11.	A	18EJCEC033	ASHYA JAIN
12.	A	18EJCEC035	ASTHA GOYAL
13.	A	18EJCEC045	DARSHAN NAHATA
14.	A	18EJCEC038	AYUSH SHARMA
15.	A	18EJCEC039	AYUSHI PRAJAPATI
16.	A	18EJCEC044	CHIRAG MAHAJAN
17.	A	18EJCEC049	DHEEREN MITTAL
18.	A	18EJCEC050	DIGVIJAY SINGH
19.	A	18EJCEC053	FARDEEN HUSSAIN
20.	A	18EJCEC055	GARIMA GOYAL
21.	A	18EJCEC057	GAURAV AGRAWAL

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SUBJECT TEACHER

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CC SECTION A

**NOTICE**

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/03

Date: 2/09/2019

This is to inform all the following students of 3rd semester section-A that a special lecture of Network Theory is to be held tomorrow at 4 P.M. in LT-14 as an improvement measure for CO1, CO2 & CO3. The lecture will include the core of theory along with numerical solving and doubt resolving sessions. It is compulsory to attend the following students to attend and if any other student wish to attend the same, may also come.

**List of Slow Learners**

Sr.	Sec.	Roll No.	Name of Student
1.	A	18EJCEC005	ABHISHEK DAVE
2.	A	18EJCEC008	AJAY KUMAR MEENA
3.	A	18EJCEC009	AKASH ARORA
4.	A	18EJCEC021	ARPIT JAIN
5.	A	18EJCEC022	ARPIT KAPOOR
6.	A	18EJCEC024	ARYAN JAIN
7.	A	18EJCEC029	ASHISH YADAV
8.	A	18EJCEC031	ASHUTOSH KAUSHIK
9.	A	18EJCEC035	ASTHA GOYAL
10.	A	18EJCEC036	ATUL KUMAR AGRAWAL
11.	A	18EJCEC037	AYUSH KUMAR
12.	A	18EJCEC038	AYUSH SHARMA
13.	A	18EJCEC050	DIGVIJAY SINGH
14.	A	18EJCEC051	DIPANSHU TOMER

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CC SECTION A

**NOTICE**

**Ref. No.:** JECRC/ECE/2019-20/ODD/IIIA/NT/04

**Date:** 30/09/2019

This is to inform all the following students of 3rd semester section-A that a special lecture of Network Theory is to be held tomorrow at 4 P.M. in LT-14 as an improvement measure for CO1, CO2, CO3 and CO4. The lecture will include the core of theory along with numerical solving and doubt resolving sessions. It is compulsory to attend the following students to attend and if any other student wish to attend the same, may also come.

**List of Slow Learners**

<b>Sr.</b>	<b>Sec.</b>	<b>Roll No.</b>	<b>Name of Student</b>
1.	A	18EJCEC001	AAKASH CHAMOLI
2.	A	18EJCEC006	ABHISHEK JAIN
3.	A	18EJCEC007	ADITYA YADAV
4.	A	18EJCEC008	AJAY KUMAR MEENA
5.	A	18EJCEC009	AKASH ARORA
6.	A	18EJCEC010	AKSHAT SHARMA
7.	A	18EJCEC011	AKSHAT TODI
8.	A	18EJCEC012	AKSHAY KUMAR BENIWAL
9.	A	18EJCEC014	AMAN JAIN
10.	A	18EJCEC015	AMAN KUMAR JANGIR
11.	A	18EJCEC019	ANKIT KUMAR SHARMA
12.	A	18EJCEC024	ARYAN JAIN
13.	A	18EJCEC025	ASHISH JAIN
14.	A	18EJCEC026	ASHISH JANGID
15.	A	18EJCEC027	ASHISH MANGAL
16.	A	18EJCEC028	ASHISH RAJ
17.	A	18EJCEC029	ASHISH YADAV
18.	A	18EJCEC031	ASHUTOSH KAUSHIK
19.	A	18EJCEC035	ASTHA GOYAL
20.	A	18EJCEC036	ATUL KUMAR AGRAWAL
21.	A	18EJCEC037	AYUSH KUMAR
22.	A	18EJCEC038	AYUSH SHARMA
23.	A	18EJCEC039	AYUSHI PRAJAPATI
24.	A	18EJCEC040	BHUMI GAJJAR
25.	A	18EJCEC041	BHUPENDAR SHARMA
26.	A	18EJCEC042	CHARUL BHATI
27.	A	18EJCEC043	CHHAYA AGARWAL

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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28.	A	18EJCEC044	CHIRAG MAHAJAN
29.	A	18EJCEC045	DARSHAN NAHATA
30.	A	18EJCEC056	GAURANG SINGHAL

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CC SECTION A

**NOTICE**

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/05

Date: 26/11/2019

This is to inform all the following students of 3rd semester section-A that a special lecture of Network Theory is to be held tomorrow at 4 P.M. in LT-14 as an improvement measure for CO5. The lecture will include the core of theory along with numerical solving and doubt resolving sessions. It is compulsory to attend the following students to attend and if any other student wish to attend the same, may also come.

**List of Slow Learners**

Sr.	Sec.	Roll No.	Name of Student
1.	A	18EJCEC008	AJAY KUMAR MEENA
2.	A	18EJCEC011	AKSHAT TODI
3.	A	18EJCEC012	AKSHAY KUMAR BENIWAL
4.	A	18EJCEC017	ANCHAL MADNANI
5.	A	18EJCEC022	ARPIT KAPOOR
6.	A	18EJCEC029	ASHISH YADAV
7.	A	18EJCEC031	ASHUTOSH KAUSHIK
8.	A	18EJCEC036	ATUL KUMAR AGRAWAL
9.	A	18EJCEC037	AYUSH KUMAR
10.	A	18EJCEC042	CHARUL BHATI
11.	A	18EJCEC045	DARSHAN NAHATA
12.	A	18EJCEC054	GARGI JAIMAN

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SUBJECT TEACHER

Exam cell, EC dept.

CC SECTION A

**Attendance of remedial class 1**  
**Subject-Network Theory**  
**Class- 3ECEA**

Date: 24/07/2019

S. No.	Sec.	Roll No.	Name of Student	Attendance
1.	A	18EJCEC008	AJAY KUMAR MEENA	P
2.	A	18EJCEC010	AKSHAT SHARMA	P
3.	A	18EJCEC011	AKSHAT TODI	P
4.	A	18EJCEC016	AMIT KUMAR CHHIPA	A
5.	A	18EJCEC017	ANCHAL MADNANI	P
6.	A	18EJCEC026	ASHISH JANGID	P
7.	A	18EJCEC029	ASHISH YADAV	P
8.	A	18EJCEC031	ASHUTOSH KAUSHIK	P
9.	A	18EJCEC036	ATUL KUMAR AGRAWAL	P
10.	A	18EJCEC037	AYUSH KUMAR	P
11.	A	18EJCEC039	AYUSHI PRAJAPATI	P
12.	A	18EJCEC042	CHARUL BHATI	A
13.	A	18EJCEC045	DARSHAN NAHATA	P

**Attendance of remedial class 2**  
**Subject-Network Theory**  
**Class- 3ECEA**

Date: 14/08/2019

Sr.	Sec.	Roll No.	Name of Student	Attendance
1.	A	18EJCEC001	AAKASH CHAMOLI	P
2.	A	18EJCEC003	ABHINAV DADHICH	A
3.	A	18EJCEC007	ADITYA YADAV	A
4.	A	18EJCEC009	AKASH ARORA	P
5.	A	18EJCEC010	AKSHAT SHARMA	P
6.	A	18EJCEC011	AKSHAT TODI	P
7.	A	18EJCEC012	AKSHAY KUMAR BENIWAL	P
8.	A	18EJCEC017	ANCHAL MADNANI	P
9.	A	18EJCEC026	ASHISH JANGID	A
10.	A	18EJCEC027	ASHISH MANGAL	A
11.	A	18EJCEC033	ASHYA JAIN	P
12.	A	18EJCEC035	ASTHA GOYAL	P
13.	A	18EJCEC045	DARSHAN NAHATA	P
14.	A	18EJCEC038	AYUSH SHARMA	P
15.	A	18EJCEC039	AYUSHI PRAJAPATI	P
16.	A	18EJCEC044	CHIRAG MAHAJAN	P
17.	A	18EJCEC049	DHEEREN MITTAL	A
18.	A	18EJCEC050	DIGVIJAY SINGH	P
19.	A	18EJCEC053	FARDEEN HUSSAIN	P
20.	A	18EJCEC055	GARIMA GOYAL	A
21.	A	18EJCEC057	GAURAV AGRAWAL	P

**Attendance of remedial class 3**  
**Subject-Network Theory**  
**Class- 3ECEA**

Date: 03/09/2019

Sr.	Sec.	Roll No.	Name of Student	Attendance
1.	A	18EJCEC005	ABHISHEK DAVE	A
2.	A	18EJCEC008	AJAY KUMAR MEENA	P
3.	A	18EJCEC009	AKASH ARORA	P
4.	A	18EJCEC021	ARPIT JAIN	P
5.	A	18EJCEC022	ARPIT KAPOOR	P
6.	A	18EJCEC024	ARYAN JAIN	P
7.	A	18EJCEC029	ASHISH YADAV	A
8.	A	18EJCEC031	ASHUTOSH KAUSHIK	P
9.	A	18EJCEC035	ASTHA GOYAL	P
10.	A	18EJCEC036	ATUL KUMAR AGRAWAL	P
11.	A	18EJCEC037	AYUSH KUMAR	P
12.	A	18EJCEC038	AYUSH SHARMA	P
13.	A	18EJCEC050	DIGVIJAY SINGH	P
14.	A	18EJCEC051	DIPANSHU TOMER	P

**Attendance of remedial class 4**  
**Subject-Network Theory**  
**Class- 3ECEA**

Date: 1/10/2019

Sr.	Sec.	Roll No.	Name of Student	Attendance
1.	A	18EJCEC001	AAKASH CHAMOLI	P
2.	A	18EJCEC006	ABHISHEK JAIN	P
3.	A	18EJCEC007	ADITYA YADAV	P
4.	A	18EJCEC008	AJAY KUMAR MEENA	A
5.	A	18EJCEC009	AKASH ARORA	A
6.	A	18EJCEC010	AKSHAT SHARMA	P
7.	A	18EJCEC011	AKSHAT TODI	P
8.	A	18EJCEC012	AKSHAY KUMAR BENIWAL	P
9.	A	18EJCEC014	AMAN JAIN	P
10.	A	18EJCEC015	AMAN KUMAR JANGIR	P
11.	A	18EJCEC019	ANKIT KUMAR SHARMA	P
12.	A	18EJCEC024	ARYAN JAIN	P
13.	A	18EJCEC025	ASHISH JAIN	P
14.	A	18EJCEC026	ASHISH JANGID	A
15.	A	18EJCEC027	ASHISH MANGAL	P
16.	A	18EJCEC028	ASHISH RAJ	A
17.	A	18EJCEC029	ASHISH YADAV	P
18.	A	18EJCEC031	ASHUTOSH KAUSHIK	P
19.	A	18EJCEC035	ASTHA GOYAL	P
20.	A	18EJCEC036	ATUL KUMAR AGRAWAL	A
21.	A	18EJCEC037	AYUSH KUMAR	P
22.	A	18EJCEC038	AYUSH SHARMA	P
23.	A	18EJCEC039	AYUSHI PRAJAPATI	P
24.	A	18EJCEC040	BHUMI GAJJAR	P
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26.	A	18EJCEC042	CHARUL BHATI	A
27.	A	18EJCEC043	CHHAYA AGARWAL	P
28.	A	18EJCEC044	CHIRAG MAHAJAN	P
29.	A	18EJCEC045	DARSHAN NAHATA	P
30.	A	18EJCEC056	GAURANG SINGHAL	P

**Attendance of remedial class 5**  
**Subject-Network Theory**  
**Class- 3ECEA**

Date: 27/11/2019

Sr.	Sec.	Roll No.	Name of Student	Attendance
1.	A	18EJCEC008	AJAY KUMAR MEENA	P
2.	A	18EJCEC011	AKSHAT TODI	P
3.	A	18EJCEC012	AKSHAY KUMAR BENIWAL	P
4.	A	18EJCEC017	ANCHAL MADNANI	P
5.	A	18EJCEC022	ARPIT KAPOOR	P
6.	A	18EJCEC029	ASHISH YADAV	A
7.	A	18EJCEC031	ASHUTOSH KAUSHIK	A
8.	A	18EJCEC036	ATUL KUMAR AGRAWAL	P
9.	A	18EJCEC037	AYUSH KUMAR	P
10.	A	18EJCEC042	CHARUL BHATI	P
11.	A	18EJCEC045	DARSHAN NAHATA	P
12.	A	18EJCEC054	GARGI JAIMAN	P

## RETEST EXAMINATION NOTICE NETWORK THEORY

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/06

Date: 25/11/2019

This is to inform the students of 3rd semester Section-A that a Retest is scheduled for the following students for Network Theory (3ECE-07) .This test include topics of CO1.

Date and Time of Test: 29/11/2019 9:00 to 9:30 AM

Venue for Test: BG-06

### SLOW LEARNER LIST UT 5(CO1)

S.NO.	ROLL NO	STUDENT NAME
1	18EJCEC011	AKSHAT TODI
2	18EJCEC012	AKSHAY KUMAR BENIWAL
3	18EJCEC017	ANCHAL MADNANI
4	18EJCEC022	ARPIT KAPOOR
5	18EJCEC029	ASHISH YADAV
6	18EJCEC030	ASHOK SINGH GURJAR
7	18EJCEC031	ASHUTOSH KAUSHIK
8	18EJCEC034	ASMIT KUMAR PARIDA
9	18EJCEC036	ATUL KUMAR AGRAWAL
10	18EJCEC037	AYUSH KUMAR
11	18EJCEC042	CHARUL BHATI
12	18EJCEC053	FARDEEN HUSSAIN

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RAJ KUMAR JAIN

HOD, ECE

SUBJECT TEACHER

Exam cell, ECE dept.

CC SECTION A

## RETEST EXAMINATION NOTICE NETWORK THEORY

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/07

Date: 25/11/2019

This is to inform the students of 3rd semester Section-A that a Retest is scheduled for the following students for Network Theory (3ECE-07). This test include topics of CO2.

Date and Time of Test: 29/11/2019 10:00 to 10:15 AM

Venue for Test: BG-06

### List of Slow Learners C02

S. No.	Sec.	Roll No.	Name of Student
1.	A	18EJCEC008	AJAY KUMAR MEENA
2.	A	18EJCEC011	AKSHAT TODI
3.	A	18EJCEC012	AKSHAY KUMAR BENIWAL
4.	A	18EJCEC017	ANCHAL MADNANI
5.	A	18EJCEC022	ARPIT KAPOOR
6.	A	18EJCEC029	ASHISH YADAV
7.	A	18EJCEC031	ASHUTOSH KAUSHIK
8.	A	18EJCEC035	ASTHA GOYAL
9.	A	18EJCEC036	ATUL KUMAR AGRAWAL
10.	A	18EJCEC037	AYUSH KUMAR
11.	A	18EJCEC042	CHARUL BHATI
12.	A	18EJCEC047	DEVANSHI NEHRA
13.	A	18EJCEC048	DEVHUTI JOSHI
14.	A	18EJCEC049	DHEEREN MITTAL
15.	A	18EJCEC054	GARGI JAIMAN

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CC SECTION A

## RETEST EXAMINATION NOTICE NETWORK THEORY

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/08

Date: 25/11/2019

This is to inform the students of 3rd semester Section-A that a Retest is scheduled for the following students for Network Theory (3ECE-07). This test include topics of CO3.

Date and Time of Test: 29/11/2019 11:00 to 11:30 AM

Venue for Test: BG-06

### List of Slow Learners C03

S. No.	Sec.	Roll No.	Name of Student
1.	A	18EJCEC008	AJAY KUMAR MEENA
2.	A	18EJCEC011	AKSHAT TODI
3.	A	18EJCEC012	AKSHAY KUMAR BENIWAL
4.	A	18EJCEC022	ARPIT KAPOOR
5.	A	18EJCEC029	ASHISH YADAV
6.	A	18EJCEC031	ASHUTOSH KAUSHIK
7.	A	18EJCEC036	ATUL KUMAR AGRAWAL
8.	A	18EJCEC037	AYUSH KUMAR
9.	A	18EJCEC042	CHARUL BHATI

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CC SECTION A

## RE-TEST EXAMINATION NOTICE NETWORK THEORY

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/09

Date: 25/11/2019

This is to inform the students of 3rd semester Section-A that a Re-Test is scheduled for the following students for Network Theory (3ECE-07). This test include topics of CO4.

Date and Time of Test: 29/11/2019 1:00 to 1:30 PM

Venue for Test: BG-06

### List of Slow Learners C04

S. No.	Sec.	Roll No.	Name of Student
1.	A	18EJCEC001	AAKASH CHAMOLI
2.	A	18EJCEC003	ABHINAV DADHICH
3.	A	18EJCEC005	ABHISHEK DAVE
4.	A	18EJCEC008	AJAY KUMAR MEENA
5.	A	18EJCEC009	AKASH ARORA
6.	A	18EJCEC011	AKSHAT TODI
7.	A	18EJCEC012	AKSHAY KUMAR BENIWAL
8.	A	18EJCEC017	ANCHAL MADNANI
9.	A	18EJCEC021	ARPIT JAIN
10.	A	18EJCEC022	ARPIT KAPOOR
11.	A	18EJCEC025	ASHISH JAIN
12.	A	18EJCEC029	ASHISH YADAV
13.	A	18EJCEC031	ASHUTOSH KAUSHIK
14.	A	18EJCEC035	ASTHA GOYAL
15.	A	18EJCEC036	ATUL KUMAR AGRAWAL
16.	A	18EJCEC037	AYUSH KUMAR
17.	A	18EJCEC041	BHUPENDAR SHARMA
18.	A	18EJCEC042	CHARUL BHATI
19.	A	18EJCEC048	DEVHUTI JOSHI
20.	A	18EJCEC049	DHEEREN MITTAL

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CC SECTION A

**RETEST EXAMINATION NOTICE NETWORK THEORY**

Ref. No.: JECRC/ECE/2019-20/ODD/IIIA/NT/10

Date: 25/11/2019

This is to inform the students of 3rd semester Section-A that a Re-Test is scheduled for the following students for Network Theory (3ECE-07). This test include topics of CO5.

Date and Time of Test: 29/11/2019 2:30 to 3:00 PM

Venue for Test: BG-06

**List of Slow Learners C05**

S. No.	Sec.	Roll No.	Name of Student
1.	A	18EJCEC008	AJAY KUMAR MEENA
2.	A	18EJCEC011	AKSHAT TODI
3.	A	18EJCEC012	AKSHAY KUMAR BENIWAL
4.	A	18EJCEC017	ANCHAL MADNANI
5.	A	18EJCEC022	ARPIT KAPOOR
6.	A	18EJCEC029	ASHISH YADAV
7.	A	18EJCEC031	ASHUTOSH KAUSHIK
8.	A	18EJCEC036	ATUL KUMAR AGRAWAL
9.	A	18EJCEC037	AYUSH KUMAR
10.	A	18EJCEC042	CHARUL BHATI
11.	A	18EJCEC045	DARSHAN NAHATA
12.	A	18EJCEC054	GARGI JAIMAN

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SUBJECT TEACHER

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CC SECTION A

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE

Department of Electronics & Communication Engg.

COURSE : B.Tech

SEMESTER III

SECTION :A,B,C

SUBJEC :NT

CODE :3EC4-06

TIME: 30 Mnt

RETEST -1(CO1)

MM: 10

CO1: Apply the basic circuital law and simplify the network using network theorems.

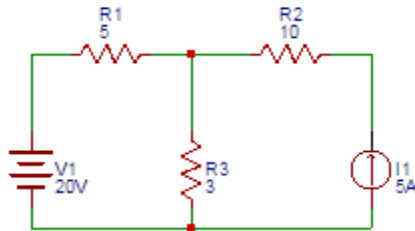
Q1 (CO1) if there are M branch currents, then we can write \_\_\_\_\_ number of independent equations. (2)

- A) M-2
- B) M-1
- C) M
- D) M+1

Q2 (CO1) if there are N nodes in a circuit, then the number of nodal equations that can be formed are? (2)

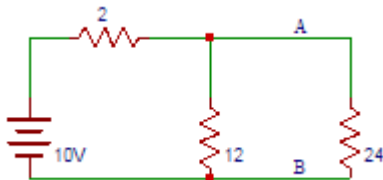
- A) N+1
- B) N
- C) N-1
- D) N-2

Q3 (CO1) in the circuit shown, find the current through 3Ω resistor using Superposition theorem. (2)



- A) 4
- B) 5
- C) 6
- D) 7

Q4 (CO1) Consider the circuit shown below. Find the equivalent Thevenin's voltage between nodes A and B. (2)



- A) 8
- B) 8.5
- C) 9
- D) 9.5

- Q5 (C02) the circuit which satisfies Reciprocity Theorem is called? (2)
- A) Short circuit
  - B) Open circuit
  - C) Linear circuit
  - D) Non-linear circuit

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE

Department of Electronics & Communication Engg.

COURSE : B.Tech

SEMESTER III

SECTION :A,B,C

SUBJEC :NT

CODE :3EC4-06

TIME: 15 Mnt

RETEST 2(CO2)

MM: 10

CO2: Appreciate the frequency domain techniques in different applications.

Q1 (CO2) what are Fourier coefficients? (2)

- a) The terms that are present in a Fourier series
- b) The terms that are obtained through Fourier series
- c) The terms which consist of the Fourier series along with their sine or cosine values
- d) The terms which are of resemblance to Fourier transform in a Fourier series are called Fourier series coefficients

Q2 (CO2) what is a line spectrum? (2)

- a) Plot showing magnitudes of waveforms are called line spectrum
- b) Plot showing each of harmonic amplitudes in the wave is called line spectrum
- c) Plot showing each of harmonic amplitudes in the wave is called line spectrum
- d) Plot showing each of harmonic amplitudes called line spectrum

Q3 (CO2) Phase sequence depends on the? (2)

- a) Field
- b) rotation of the field
- c) armature
- d) rotation of the armature

Q4 (CO2) Find the Fourier transform of an exponential signal  $f(t) = e^{-at} u(t)$ ,  $a > 0$ . (2)

- a)  $1/a + j\omega$
- b)  $1/a - j\omega$
- c)  $-1/a + j\omega$
- d)  $-1/a - j\omega$

Q5 (CO2) Fourier series uses which domain representation of signals? (2)

- a) Time domain representation
- b) Frequency domain representation
- c) Both combined
- d) neither depends on the situation

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE

Department of Electronics & Communication Engg.

COURSE : B.Tech

SEMESTER III

SECTION :A,B,C

SUBJECT :NT

CODE :3EC4-06

TIME: 30 Mnt

RETEST 3(CO3)

MM: 10

CO3: Apply Laplace Transform for steady state and transient analysis.

1. The resistance element \_\_\_\_\_ while going from the time domain to frequency domain. (1)
- a) does not change
  - b) increases
  - c) decreases
  - d) increases exponentially

2. From the circuit shown below, find the value of current in the loop. (3)



- a)  $(V/R)/(s+1/RC)$
  - b)  $(V/C)/(s+1/R)$
  - c)  $(V/C)/(s+1/RC)$
  - d)  $(V/R)/(s+1/R)$
3. In the circuit shown below, if current is defined as the response signal of the circuit, then determine the transfer function. (3)



- a)  $H(s)=C/(S^2 LC+RCS+1)$
  - b)  $H(s)=SC/(S^2 LC-RCS+1)$
  - c)  $H(s)=SC/(S^2 LC+RCS+1)$
  - d)  $H(s)=SC/(S^2 LC+RCS-1)$
4. The relation between current and voltage in case of inductor is? (1)
- a)  $v=Ldt/di$
  - b)  $v=Ldi/dt$
  - c)  $v=dt/di$
  - d)  $v=di/dt$

5. The s-domain equivalent of the capacitor reduces to a capacitor with impedance? (2)
- a)  $sC$
  - b)  $C$
  - c)  $1/C$
  - d)  $1/sC$

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE

Department of Electronics & Communication Engg.

COURSE : B.Tech

SEMESTER III

SECTION :A,B,C

SUBJECT :NT

CODE :3EC4-06

TIME: 30 Mnt

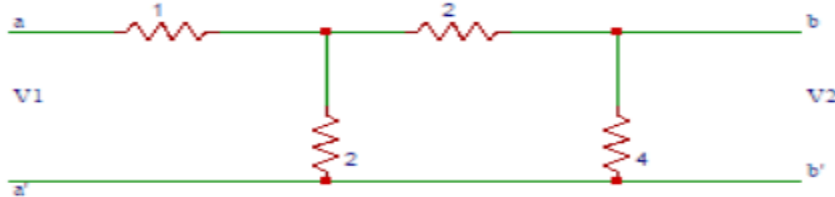
RETEST 4(CO4)

MM: 10

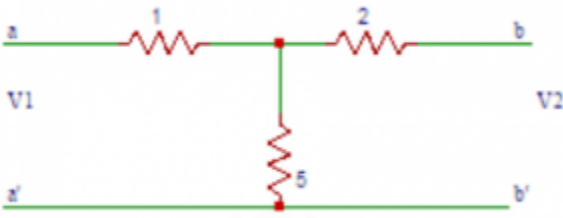
CO4: Evaluate transient response and two-port network parameters.

1. In determining open circuit impedance parameters, among  $V_1$ ,  $V_2$ ,  $I_1$ ,  $I_2$ , which of the following are dependent variables? (1)
  - a)  $V_1$  and  $V_2$
  - b)  $I_1$  and  $I_2$
  - c)  $V_1$  and  $I_2$
  - d)  $I_1$  and  $V_2$

2. Find the Z – parameter  $Z_{11}$  in the circuit shown below. (3)



- a) 1
  - b) 1.5
  - c) 2
  - d) 2.5
3. In the circuit shown below, find the transmission parameter A. (3)



- a) 6/5
  - b) 5/6
  - c) 3/4
  - d) 4/3
4. The hybrid parameter  $h_{11}$  is called? (1)
    - a) short circuit input impedance
    - b) short circuit forward current gain
    - c) open circuit reverse voltage gain
    - d) open circuit output admittance

5. In determining short circuit impedance parameters, among  $V_1$ ,  $V_2$ ,  $I_1$ ,  $I_2$ , which of the following are dependent variables? (2)
- a)  $V_1$  and  $V_2$
  - b)  $I_1$  and  $I_2$
  - c)  $V_1$  and  $I_2$
  - d)  $I_1$  and  $V_2$

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE

Department of Electronics & Communication Engg.

COURSE : B.Tech

SEMESTER III

SECTION :A,B,C

SUBJEC :NT

CODE :3EC4-06

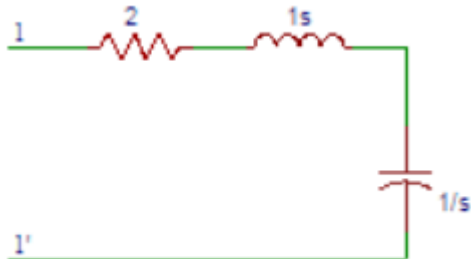
TIME: 30 Mnt

RETEST 5(CO5)

MM: 10

CO5: Analyze the series resonant and parallel resonant circuit and design filters.

1. The circuit is said to be in resonance if the current is \_\_\_\_\_ with the applied voltage. (2)
  - a) in phase
  - b) out of phase
  - c)  $45^\circ$  out of phase
  - d)  $90^\circ$  out of phase
2. A filter which passes without attenuation all frequencies up to the cut-off frequency  $f_c$  and attenuates all other frequencies greater than  $f_c$  is called? (2)
  - a) high pass filter
  - b) low pass filter
  - c) band elimination filter
  - d) band pass filter
3. A network either T or  $\pi$ , is said to be of the constant-k type if  $Z_1$  and  $Z_2$  of the network satisfy the relation? (2)
  - a)  $Z_1 Z_2 = k$
  - b)  $Z_1 Z_2 = k^2$
  - c)  $Z_1 Z_2 = k^3$
  - d)  $Z_1 Z_2 = k^4$
4. The ratio of voltage transform at first port to the voltage transform at the second port is called? (2)
  - a) Voltage transfer ratio
  - b) Current transfer ratio
  - c) Transfer impedance
  - d) Transfer admittance
5. For the network shown in the figure, find the driving point impedance. (2)



- a)  $(s^2 - 2s + 1)/s$
- b)  $(s^2 + 2s + 1)/s$
- c)  $(s^2 - 2s - 1)/s$
- d)  $(s^2 + 2s - 1)/s$

### Reassessment test results to improve CO-1 of slow learner

S.NO.	ROLL NO	NAME	MM	Target Achieved
1	18EJCEC008	AJAY KUMAR MEENA	4	N
2	18EJCEC011	AKSHAT TODI	9	Y
3	18EJCEC012	AKSHAY KUMAR BENIWAL	6	Y
4	18EJCEC017	ANCHAL MADNANI	7	Y
5	18EJCEC022	ARPIT KAPOOR	4	N
6	18EJCEC029	ASHISH YADAV	8	Y
7	18EJCEC030	ASHOK SINGH GURJAR	8	Y
8	18EJCEC031	ASHUTOSH KAUSHIK	6	Y
9	18EJCEC034	ASMIT KUMAR PARIDA	9	Y
10	18EJCEC036	ATUL KUMAR AGRAWAL	9	Y
11	18EJCEC037	AYUSH KUMAR	8	Y
12	18EJCEC042	CHARUL BHATI	7	Y
13	18EJCEC053	FARDEEN HUSSAIN	9	Y

**Reassessment test results to improve CO-2 of slow learner**

S.NO.	ROLL NO	NAME	MARKS(10)	Target Achieved
1	18EJCEC008	AJAY KUMAR MEENA	4	N
2	18EJCEC011	AKSHAT TODI	6	Y
3	18EJCEC012	AKSHAY KUMAR BENIWAL	6	Y
4	18EJCEC017	ANCHAL MADNANI	2	N
5	18EJCEC022	ARPIT KAPOOR	10	Y
6	18EJCEC029	ASHISH YADAV	10	Y
7	18EJCEC031	ASHUTOSH KAUSHIK	8	Y
8	18EJCEC035	ASTHA GOYAL	8	Y
9	18EJCEC036	ATUL KUMAR AGRAWAL	4	N
10	18EJCEC037	AYUSH KUMAR	6	Y
11	18EJCEC042	CHARUL BHATI	6	Y
12	18EJCEC047	DEVANSHI NEHRA	8	Y
13	18EJCEC048	DEVHUTI JOSHI	8	Y
14	18EJCEC049	DHEEREN MITTAL	10	Y
15	18EJCEC054	GARGI JAIMAN	10	Y

### Reassessment test results to improve CO-3 of slow learner

S.NO.	ROLL NO	Name Of Student	Marks	Target Achieved
1	18EJCEC008	AJAY KUMAR MEENA	5	N
2	18EJCEC011	AKSHAT TODI	8	Y
3	18EJCEC012	AKSHAY KUMAR BENIWAL	6	Y
4	18EJCEC022	ARPIT KAPOOR	8	Y
5	18EJCEC029	ASHISH YADAV	10	Y
6	18EJCEC031	ASHUTOSH KAUSHIK	8	Y
7	18EJCEC036	ATUL KUMAR AGRAWAL	8	Y
8	18EJCEC037	AYUSH KUMAR	6	Y
9	18EJCEC042	CHARUL BHATI	10	Y

### Reassessment test results to improve CO-4 of slow learner

S.NO.	ROLL NO	Name Of students	Marks(10)	Target Achieved
1	18EJCEC001	AAKASH CHAMOLI	8	Y
2	18EJCEC003	ABHINAV DADHICH	8	Y
3	18EJCEC005	ABHISHEK DAVE	6	Y
4	18EJCEC008	AJAY KUMAR MEENA	6	Y
5	18EJCEC009	AKASH ARORA	8	Y
6	18EJCEC011	AKSHAT TODI	5	N
7	18EJCEC012	AKSHAY KUMAR BENIWAL	5	N
8	18EJCEC017	ANCHAL MADNANI	6	Y
9	18EJCEC021	ARPIT JAIN	8	Y
10	18EJCEC022	ARPIT KAPOOR	5	N
11	18EJCEC025	ASHISH JAIN	8	Y
12	18EJCEC029	ASHISH YADAV	8	Y
13	18EJCEC031	ASHUTOSH KAUSHIK	4	N
14	18EJCEC035	ASTHA GOYAL	8	Y
15	18EJCEC036	ATUL KUMAR AGRAWAL	5	N
16	18EJCEC037	AYUSH KUMAR	8	Y
17	18EJCEC041	BHUPENDAR SHARMA	10	Y
18	18EJCEC042	CHARUL BHATI	8	Y
19	18EJCEC048	DEVHUTI JOSHI	8	Y
20	18EJCEC049	DHEEREN MITTAL	8	Y

### Reassessment test results to improve CO-5 of slow learner

S.NO.	ROLL NO	Name of students	Marks(10)	Target Achieved
1	18EJCEC008	AJAY KUMAR MEENA	6	Y
2	18EJCEC011	AKSHAT TODI	6	Y
3	18EJCEC012	AKSHAY KUMAR BENIWAL	8	Y
4	18EJCEC017	ANCHAL MADNANI	7	Y
5	18EJCEC022	ARPIT KAPOOR	4	N
6	18EJCEC029	ASHISH YADAV	6	Y
7	18EJCEC031	ASHUTOSH KAUSHIK	6	Y
8	18EJCEC036	ATUL KUMAR AGRAWAL	8	Y
9	18EJCEC037	AYUSH KUMAR	6	Y
10	18EJCEC042	CHARUL BHATI	8	Y
11	18EJCEC045	DARSHAN NAHATA	6	Y
12	18EJCEC054	GARGI JAIMAN	10	Y