INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

ELECTRICAL AND ELECTRONICS ENGINEERING

TUTORIAL QUESTION BANK

Course Name	**:**	**NETWORK ANALYSIS**
Course Code	**:**	**AEE005**
Class	**:**	**B.Tech III Semester**
Branch	**:**	**Electrical and Electronics Engineering**
Academic Year	**:**	**2018 – 2019**
Course Coordinator	**:**	**Ms. S Swathi, Assistant Professor, EEE**
Course Faculty	**:**	**Dr. D Shobharani, Professor, EEE** **Ms. S Swathi, Assistant Professor, EEE**

COURSE OBJECTIVES:

The course should enable the students to:

I	Analyze three phase star and delta connected circuits to calculate the active and reactive power.
II	Understand the transient response of series and parallel RL, RC and RLC circuits for DC and AC excitations.
III	Discuss the concepts of locus diagram, network functions and to calculate the two port network parameters.
IV	Designdifferent types of filters and perform the digital simulation of electric circuits.

COURSE LEARNING OUTCOMES:

Students, who complete the course, will have demonstrated the ability to do the following:

CAEE005.01	Analyze three phase star and delta circuits with different configuration.
CAEE005.02	Understand the concept of phasor diagram for three phase systems.
CAEE005.03	Discuss the active, reactive and apparent power and power factor in three phase circuits.
CAEE005.04	Estimate the transient response of series and parallel circuits with AC and DC excitation.
CAEE005.05	Evaluate the transient response of first and second order electric circuits using differential equation approach.
CAEE005.06	Determine the transient response of first and second order electric circuits using laplace transform technique.
CAEE005.07	Explain the concept of locus diagram for series and parallel circuits.
CAEE005.08	Generalize the concept of network functions for one port and two port networks.
CAEE005.09	Examine the electric networks in time domain and frequency domain.
CAEE005.10	Calculate Z, Y, ABCD, H and image parameters of two port network.
CAEE005.11	Relate various two port parameters and inter relationships between them.

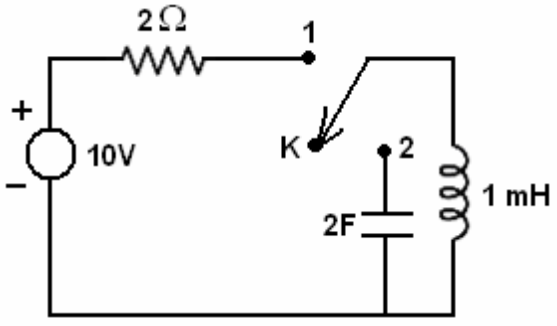
CAEE005.12	Outline the concepts of interconnections of two port networks.
CAEE005.13	Design of low pass, high pass, band pass, band elimination filters and their characteristics.
CAEE005.14	Summarize the characteristics of electric circuit using Matlab.
CAEE005.15	Use the technique of Fourier transforms to solve the electric circuit problems.
CAEE005.16	Apply the concept of network theorems, switching transient to solve real time world applications.
CAEE005.17	Process the knowledge and skills for employability and to succeed national and international level competitive examinations.

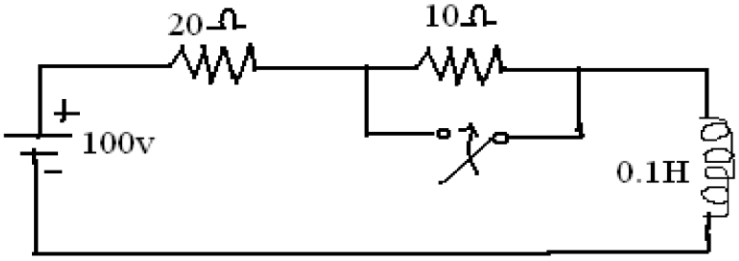
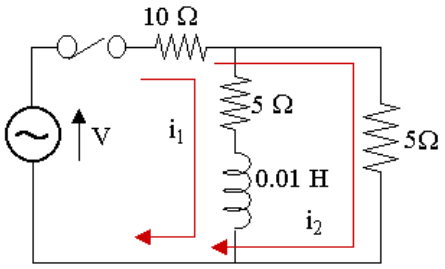
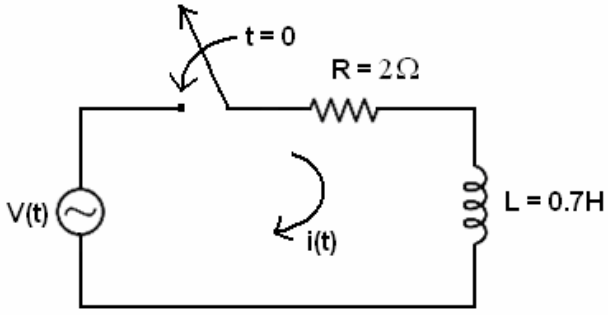
UNIT – I			
THREE PHASE CIRCUITS			
PART – A (SHORT ANSWER QUESTIONS)			
S. No	**Question**	**Bloom's Taxonomy Level**	**Course Learning Outcomes**
1	What are the advantages of a three phase system over a single phase system?	Understand	CAEE005.01
2	Obtain the relationship between line and phase voltage in a 3-phase balanced star connected system.	Understand	CAEE005.01
3	Obtain the relationship between line and phase voltage in a 3-phase balanced delta connected system.	Understand	CAEE005.01
4	Write the equations of line voltages in a balanced 3 phase system?	Understand	CAEE005.01
5	Obtain the relationship between line and phase current in a 3-phase balanced star connected system.	Understand	CAEE005.01
6	Obtain the relationship between line and phase currents in a 3-phase balanced delta connected system.	Understand	CAEE005.01
7	Write the expression for power factor in an ac circuit?	Remember	CAEE005.03
8	Write the expression for active power in a balanced 3 phase circuit?	Remember	CAEE005.03
9	Write the expression for reactive power in a balanced 3 phase circuit?	Understand	CAEE005.03
10	Write the minimum number of wattmeter's required for measuring 3 phase power?	Remember	CAEE005.03
11	Write the expression for total power in a balanced 3 phase circuit?	Understand	CAEE005.03
12	Write down the expression for power factor in two wattmeter method?	Remember	CAEE005.03
13	Write down the relationship between the readings of two wattmeters when the power factor is zero?	Remember	CAEE005.03
14	Write the value of neutral current in a balanced 3 phase system.	Remember	CAEE005.01
15	Define unbalanced loads.	Understand	CAEE005.01
16	Write the relation between line voltage and phase voltage in delta or mesh connected system.	Remember	CAEE005.01
17	Write the relation between line voltage and phase voltage in wye connected system.	Remember	CAEE005.01

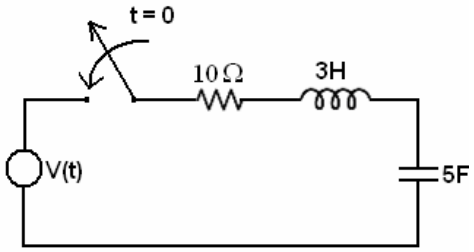
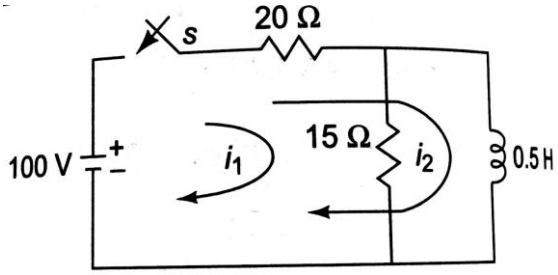
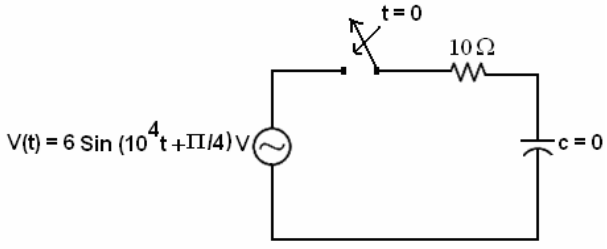
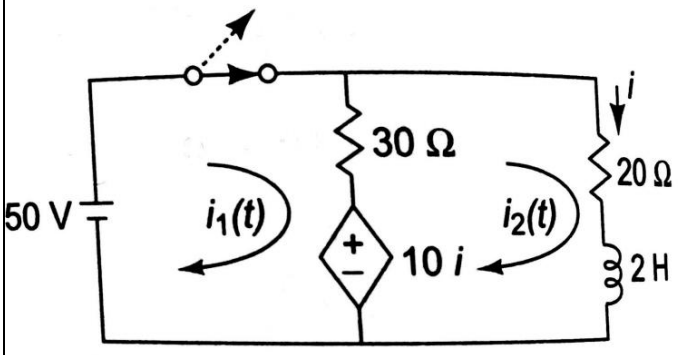
18	In a delta connected system, the voltage across the terminals R and Y is 400∠0. Calculate the line voltage V_{RY}. Assume RYB phase sequence.	Understand	CAEE005.01
19	What is meant by a phasor diagram?	Understand	CAEE005.02
20	Draw the phasor diagram of balanced star connected system.	Understand	CAEE005.02
21	Draw the phasor diagram of balanced delta connected system.	Understand	CAEE005.02
PART – B (LONG ANSWER QUESTIONS)			
1	What is phase sequence? Explain its significance. What is the difference between RYB phase sequence and RBY phase sequence?	Understand	CAEE005.02
2	Derive the relationship between line and phase quantities in a 3-phase balanced, star connectedsystem and draw the phasor diagram.	Understand	CAEE005.02
3	Derive the relationship between line and phase quantities in a 3-phase delta connected system balanced delta connected system and draw the phasor diagram.	Remember	CAEE005.02
4	Three identical impedances of (3+j4) ohm are connected in delta. Find an equivalent star network such that the line current is the same when connected to the samesupply.	Understand	CAEE005.01
5	Derive the expressions for wattmeter readings in two wattmeter method with balanced star connected load.	Understand	CAEE005.01
6	Derive the relationship between line and phase voltage in a 3-phase unbalanced delta connected system.	Remember	CAEE005.02
7	Derive the formula for power factor in two wattmeter method.	Understand	CAEE005.03
8	Derive the relationship between line and phase current in a 3-phase unbalanced star connected system.	Understand	CAEE005.02
9	With the help of connection diagram and phasor diagram, show that two wattmeter's are sufficient to measure active power in a three phase three wire system with balanced star connected load.	Understand	CAEE005.03
10	What are the advantages of three phase system, explain in short three phase generation.	Understand	CAEE005.01
11	Three identical impedances of (3+j4) ohm are connected in star. Find an equivalent delta network such that the line current is the same when connected to the same supply.	Remember	CAEE005.01
12	Explain difference between line voltage and phase voltage, similarly line current and phase current.	Understand	CAEE005.01
13	With the help of connection diagram and phasor diagram, show that two wattmeter's are sufficient to measure active power in a three phase three wire system with balanced delta connected load.	Understand	CAEE005.03
14	Define symmetrical system and explain the concept of balanced load.	Remember	CAEE005.01
PART – C (ANALYTICAL QUESTIONS)			
1	Three impedance each 5 +j12 ohm is connected in star are connected to a 220 V three phase, 50HZ supply. Calculate the line currents and the power drawn by the circuit	Understand	CAEE005.03
2	A three phase balanced delta connected load of (4+j8) ohm is connected across a 400V, 3-Ø balanced supply. Determine the phase currents and line currents. Assume the phase of sequence to be RYB. Also calculate the power drawn by load.	Remember	CAEE005.03

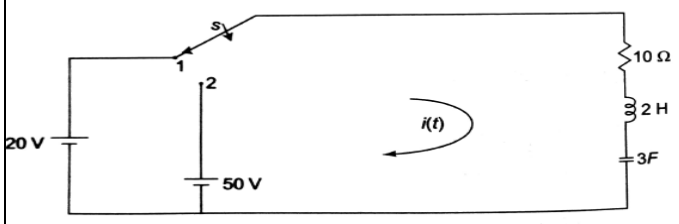
3	An unbalanced four-wired star –connected load has a balanced supply voltage of 400V.the load impedances are Z_R =4+j8; Z_Y=3+j4;and Z_B =15+j20;.calculate the line currents, neutral current and the total power, also draw the Phasor diagram.	Understand	CAEE005.01
4	Determine the line currents and total power supplied to a delta connected load of $Z_{ab}=10\angle 60$, $Z_{bc}=20\angle 90$, $Z_{ca}=25\angle 30$. Assume three phase 400 V abc system.	Understand	CAEE005.01
5	A symmetrical, three phase, three wire 440V,supply is connected to a star-connected load. The impedances are Z_R =2+j3; Z_Y=1-j2; and Z_B =3+j4;find its equivalent delta-connected load. The phase sequence is RYB.	Remember	CAEE005.03
6	A symmetrical, three phase, three wire 400V,supply is connected to a delta-connected load. The impedances are $Z_{RY}=10\angle 60$, $Z_{bc}=20\angle 90$, $Z_{ca}=25\angle 30$. Find its equivalent star -connected load. The phase sequence is abc.	Remember	CAEE005.03
7	A symmetrical balanced star-connected system with phase sequence is RYB. The phase voltage is V_{RN} =230<0.calculate three line voltages.	Understand	CAEE005.03
8	A balanced three phase is connected to balanced 3 - phase power system. The line voltage is 480 volts and the line current is 10 A. the angle of the phase impedance of the load 60. Find the complex power and real power absorbed by the load	Understand	CAEE005.03
9	Calculate the total power input and readings of the two wattmeters connected to measure power in a three –phase balanced load, if the reactive power input is 15KVAR,and the load pf is 0.8	Remember	CAEE005.01
10	Two wattmeters are connected to measure power in a three-phase circuit. The reading of one the meters is 5KW when the load power factor is unity.tf the power factor of the load is changed to 0.707 lagging, without changing the total input power, calculate the readings of the two wattmeters.	Understand	CAEE005.01
11	Three identical impedances are star connected across 440V; 50HZ supply. the three line currents are I_R =20∠-40; I_Y=20∠-160; I_R =20∠80;find the values of the elements. total power and the readings of wattmeters to measure the power.	Understand	CAEE005.03
12	A 3-phase 500 V motor operates at a power factor of 0.4 and takes an input power of 30 kW. Two watt meters are employed to measure the input power. Find readings on each instrument.	Understand	CAEE005.01
13	Two wattmeters are used to measure power in a 3-phase three wire load. Determine the total power, power factor and reactive power, if the two wattmeter's read i) 1000W each, but of opposite sign	Remember	CAEE005.01
14	Two wattmeters are used to measure power in a 3-phase three wire load. Determine the total power, power factor and reactive power, if the two wattmeter's read i) 1000W each, both positive ii) 1000W each, but of opposite sign	Understand	CAEE005.01
15	Two wattmeter's are used to measure power in a 3-phase three wire load. Determine the total power, power factor and reactive power, if the two wattmeter's read i) 5000W each, both positive.	Remember	CAEE005.03
16	Two wattmeters are used to measure power in a 3-phase three wire load. Derive he equation to measure power factor. Determine the total power, power factor and reactive power, if the two wattmeter's read i) 2000W each, both positive ii) 2000W each, but of opposite sign	Understand	CAEE005.03
17	A balance delta load is supplied from a symmetrical 3-phase, 400v, 50 Hz supply system. The current in each phase is 20A and lags behind its phase voltage by an angle of 40 degrees. Calculate (a) Total power	Remember	CAEE005.03

18	A balanced star-connected load 4+j3 per phase is connected to a balanced 3-phase 400v supply. The phase currents is 12 A, find (a) The total active power (b) Reactive power and	Understand	CAEE005.03
UNIT – II			
DC AND AC TRANSIENT ANALYSIS			
PART – A (SHORT ANSWER QUESTIONS)			
1	Explain why the current in a pure inductance cannot change in zero time	Understand	CAEE005.04
2	Explain why the voltage across a capacitor cannot change instantaneously	Understand	CAEE005.04
3	What is the significance of time constant of R-L circuit?	Understand	CAEE005.04
4	What are the different ways of defining time constant	Understand	CAEE005.04
5	What are transients in electric circuits?	Understand	CAEE005.04
6	Distinguish between steady state and transient response.	Remember	CAEE005.04
7	What is mean by steady state condition?	Understand	CAEE005.04
8	Explain initial conditions in a network?	Remember	CAEE005.04
9	Explain initial conditions of basic passive elements?	Remember	CAEE005.04
10	What is the significance of initial conditions in a step response of RL and RC circuits	Understand	CAEE005.04
11	What is meant by step response of circuit?	Understand	CAEE005.04
12	Calculate the time constant of simple RL circuit with R=10 MΩ and L=10 μH.	Understand	CAEE005.04
13	What is meant by driven circuit and un driven circuit ?	Remember	CAEE005.04
14	Explain the significance of time constant in case of series RC circuit ?	Understand	CAEE005.04
15	Define laplace transform of function f(t).and state the properties of laplace transform?	Understand	CAEE005.04
16	Define and explain characteristics of unit step function .	Remember	CAEE005.04
17	Define and explain characteristics of unit ramp function .	Understand	CAEE005.04
18	Define and explain characteristics of unit impulse function.	Understand	CAEE005.04
19	State intial value theorem .	Remember	CAEE005.04
20	State final value theorem.	Remember	CAEE005.04
PART – B (LONG ANSWER QUESTIONS)			
1	Explain the significance of initial conditions. Write a note on initial conditions in elements.	Understand	CAEE005.04
2	Define time constant. Explain time constant of series RL and RC circuit.	Understand	CAEE005.04
3	Derive the transient response for series RL circuit for DC excitation using differential equation approach.	Remember	CAEE005.05
4	Derive the transient response for series RC circuit for DC excitation using differential equation approach.	Understand	CAEE005.05

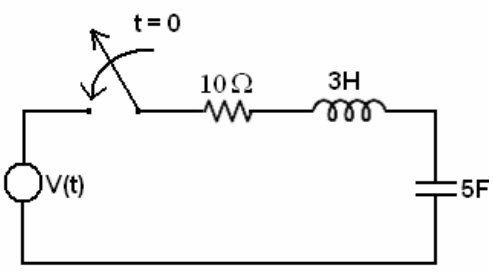
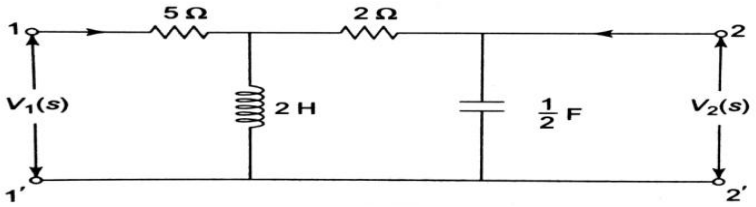
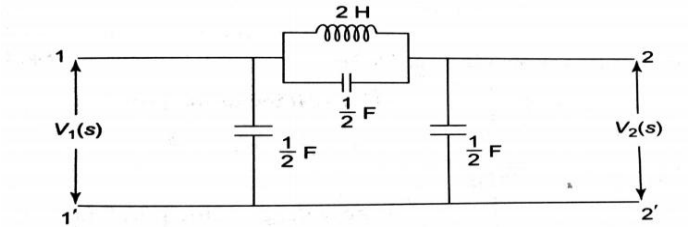
5	Derive the transient response for series RLC circuit for DC excitation using differential equation approach.	Understand	CAEE005.05
6	Derive the transient response for series RL circuit for DC excitation using Laplace approach.	Understand	CAEE005.06
7	Derive the transient response for series RC circuit for DC excitation using Laplace approach.	Understand	CAEE005.06
8	Derive the transient response for series RLC circuit for DC excitation using Laplace approach.	Understand	CAEE005.06
9	Derive the transient response for series RL circuit for ac excitation using differential equation approach.	Understand	CAEE005.05
10	Derive the transient response for series RC circuit for ac excitation using differential equation approach.	Understand	CAEE005.05
11	Derive the transient response for series RLC circuit for ac excitation using differential equation approach.	Understand	CAEE005.05
12	Derive the transient response for series RL circuit for ac excitation using Laplace approach.	Understand	CAEE005.06
13	Derive the transient response for series RC circuit for ac excitation using Laplace approach.	Understand	CAEE005.06
14	Derive the transient response for parallel RL circuit for DC excitation using differential equation approach.	Understand	CAEE005.05
15	Derive the transient response for parallel RC circuit for DC excitation using Laplace approach.	Understand	CAEE005.05
	PART – C (ANALYTICAL QUESTIONS)		
1	A series RL circuit with R = 10 ohms and L = 0.1 H has a sinusoidal voltage source V = 150 volts applied at a time t=0. Find the expression for the total current. Use differential equation method	Understand	CAEE005.06
2	A series RL circuit with R = 10 ohms and C = 1 μF has a sinusoidal voltage source V = 200 volts applied at a time t=0. Find the expression for the total current. Use differential equation method	Understand	CAEE005.05
3	A series R C circuit with R = 100 Ω and C = 25 μF has a sinusoidal excitation V(t) = 250. Find the total current assuming that the capacitor is initially uncharged. Use Laplace transformation approach.	Understand	CAEE005.05
4	For the circuit given in Figure steady state conditions are reached for the switch K in position '1'. At t = 0, the switch is changed to position 2. Use the time domain method to determine the current through the inductor for all t≥0. 	Understand	CAEE005.04

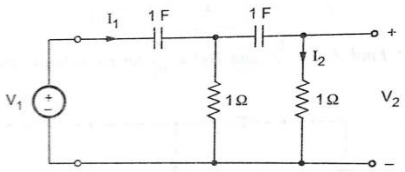
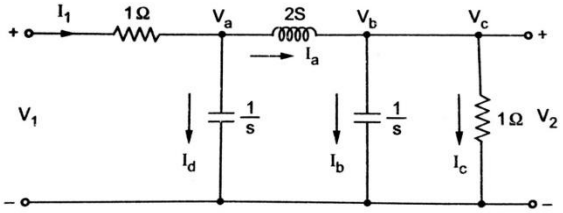
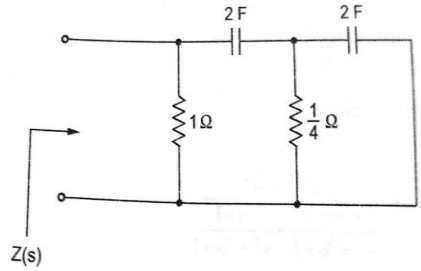
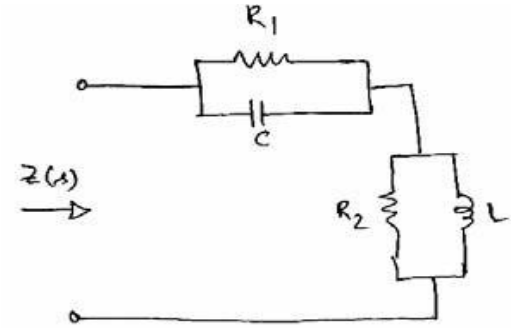
5	A dc voltage of 100V is applied in the circuit shown in figure a and the switch iskept open. The switch K is closed at t = 0. Find the complete expression for the current 	Understand	CAEE005.04
6	In the two mesh network shown in fig, the switch is closed at t=0 and the voltage source is given by V=150 sin (1000t) V. Find the currents i1 and i2 	Understand	CAEE005.04
7	A series RL circuit with R = 50 ohms and L = 0.2 H has a sinusoidal voltage source V = 150 sin(500*t* + 30°) volts applied at a time when t=0. Find the expression for the total current for t> 0. Use Laplace transformsmethod	Understand	CAEE005.06
8	A series R C circuit with R = 100 Ω and C = 25 μF has a sinusoidal excitation V(t) = 250 Sin 500t. Find the total current assuming that the capacitor is initially uncharged. Use time domain approach.	Understand	CAEE005.05
9	Obtain the current i(t) for t ≥ 0 for a series RLC circuit with R = 10 Ω, L = 0.5 H, C = 1 μF for V = 100 using differential equation approach.	Understand	CAEE005.05
10	Obtain the current i(t) for t ≥ 0 for a series RLC circuit with R = 25 Ω, L = 1 H, C = 10 μF for V = 10 using Laplace approach.	Remember	CAEE005.06
11	A Sinusoidal Voltage of 12 sin 8 t Volts is applied at t = 0 to a RL series of R= 5Ω and L = 1 H. By usingtime domain approach, determine the circuit current i (t) for. Assume zero initial condition.	Understand	CAEE005.05
12	A Sinusoidal Voltage of 12 sin 8 t Volts is applied at t = 0 to a RC series of R= 5Ω and C = 1 uF. Determine the circuit current i (t) for. Assume zero initial condition.	Understand	CAEE005.05
13	For the circuit given below in Figure.2, the applied voltage is V(t) = 10 sin(200t+60°). Find the current through the circuit for t ≥ 0. Assume zero initial Condition. Use time domain approach. 	Remember	CAEE005.05

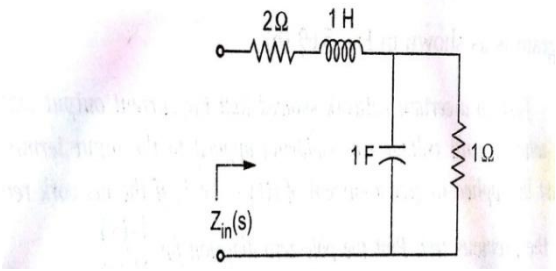
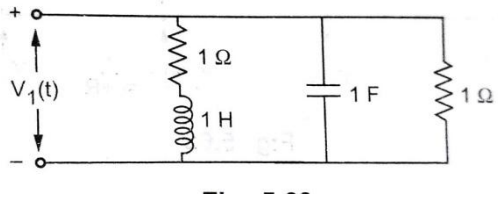
14	In the circuit shown determine the complete solution for the current, when the witch is closed at t=0. Applied voltage is v(t) = 400 cos (500t + 30). Find the total current at t > 0 using time domain approach. 	Understand	CAEE005.04
15	For the circuit shown in figure determine the currents i_1 and i_2 when the switch is closed at t=0 	Understand	CAEE005.04
16	For the circuit shown in Figure determine the particular solution for i(t) through thecircuit. Assume zero initial conditions. 	Remember	CAEE005.05
17	For the circuit shown in figure below find the current in 20ohm when the switch is opened at t=0 	Understand	CAEE005.05

18	In the network shown in figure below the switch is moved from the position 1 to 2 at t=0.the switch is in position 1 for a long time. determine the current expression i(t) 	Understand	CAEE005.05
	UNIT – III		
	NETWORK FUNCTIONS		
	PART – A (SHORT ANSWER QUESTIONS)		
1	Draw the locus diagram of series RL circuit with variable R and constant L.	Remember	CAEE005.07
2	Draw the locus diagram of series RC circuit with variable R and constant C.	Remember	CAEE005.07
3	What is the significance of locus diagram?	Understand	CAEE005.07
4	Draw the locus diagram of series RC circuit with variable C and constant R.	Remember	CAEE005.07
5	Write the expression for radius and centre for series RL circuit with variable R and constant L.	Remember	CAEE005.07
6	Draw the locus diagram of series RL circuit with variable L and constant R.	Remember	CAEE005.07
7	Write the expression for radius and centre for series RL circuit with variable L and constant C.	Remember	CAEE005.07
8	Write the expression for radius and centre for series RC circuit with variable C and constant R.	Remember	CAEE005.07
9	Write the expression for radius and centre for series RC circuit with variable R and constant C.	Remember	CAEE005.07
10	Draw the locus diagram of RC circuit in parallel with variable R.	Understand	CAEE005.08
11	Write the equation which governs the locus diagram of a series RL circuit with variable R	Remember	CAEE005.07
12	Write the equation which governs the locus diagram of a series RC circuit with variable R	Remember	CAEE005.07
13	Write the equation which governs the locus diagram of a series RL circuit with variable L	Remember	CAEE005.07
14	Write the equation which governs the locus diagram of a series RC circuit with variable C	Remember	CAEE005.07
11	What is a transfer function? Give one example.	Remember	CAEE005.08
12	Explain any two necessary conditions for transfer functions.	Understand	CAEE005.08
13	According to Routh Criteria when a network is said to be stable?	Understand	CAEE005.09
14	Obtain the transform representation of a series RLC circuit	Remember	CAEE005.09

15	Obtain the transform impedance of an inductor.	Understand	CAEE005.08
16	Obtain the transform impedance of a capacitor.	Understand	CAEE005.08
17	Explain any two necessary conditions for driving point functions.	Understand	CAEE005.08
18	What is a driving point function? Explain with one example.	Remember	CAEE005.08
19	Explain the concept of complex frequency.	Understand	CAEE005.09
20	Define voltage transfer ratio.	Understand	CAEE005.09
21	Define current transfer ratio.	Remember	CAEE005.09
22	Define transfer impedance and transfer admittance.	Remember	CAEE005.09
23	Define driving point impedance function.	Understand	CAEE005.09
24	Define driving point admittance function.	Remember	CAEE005.09
25	Define poles and zeros for a transfer function?	Understand	CAEE005.09
PART – B (LONG ANSWER QUESTIONS)			
1	What is Locus diagram and show that the locus diagram of series RL circuit with variable R and fixed value of L is a semi-circle.	Remember	CAEE005.07
2	Draw the locus diagram of series RC circuit with fixed value of R and variable C.	Remember	CAEE005.07
3	Explain the locus diagram of series RL circuit with variable L and fixed value of R.	Understand	CAEE005.07
4	Draw the locus diagram of series RC circuit with fixed value of C and variable R.	Remember	CAEE005.07
5	Show that the locus diagram of RL circuit in parallel with variable R is a straight line.	Remember	CAEE005.07
6	Show that the locus diagram of RC circuit in parallel with variable R is a straight line.	Understand	CAEE005.07
7	The transform voltage V(s) of a network is given by $V(s) = 4s/(s+2)(s^2+2s+2)$ plot its pole-zero diagram and hence obtain v(t)	Understand	CAEE005.09
8	What is a driving point function? Explain the necessary conditions for driving point functions	Understand	CAEE005.08
9	What is a transfer function? Explain the necessary conditions for transfer functions.	Understand	CAEE005.08
10	For the given network function draw pole zero diagram and hence obtain the time domain response i(t) if $I(s) = 5S / (S+1)(s^2+4S+8)$	Understand	CAEE005.09
11	Explain the transfer functions of two port networks	Remember	CAEE005.08
12	Define and explain the following: port, driving point functions and Transfer functions.	Understand	CAEE005.08

13	Draw the transformed network for the given circuit 	Understand	CAEE005.08
14	The Laplace transform of a voltage v(t) is V(s)=4(s+1)/(s+2)(s+3). Draw poles and zeros of this function and determine v(t) using pole-zero plot	Understand	CAEE005.08
15	What is a pole-zero plot? What is its significance? Explain time domain behavior from pole zero plot.	Remember	CAEE005.08
16	For the two port network shown in figure determine driving point impedance function $Z_{11}(s)$,transfer impedance $Z_{21}(s)$,and voltage transfer ratio $G_{21}(s)$ 	Understand	CAEE005.08
17	For the network shown in figure determine the following transfer functions $G_{21}(s)$ and $Z_{21}(s)$ 	Understand	CAEE005.08
18	The Laplace transform of a voltage v(t) is V(s)=(s+6)/(s+2)(s+4). Draw poles and zeros of this function and determine v(t) using pole-zero plot	Remember	CAEE005.08
	PART – C (ANALYTICAL QUESTIONS)		
1	For a series RL circuit with variable R, plot the locus of the current, mark the range of I for maximum and minimum values of R, and maximum power consumed in the circuit. Assume X_L=25Ω and R = 50 Ω. The voltage is 200 V, 50 Hz.	Remember	CAEE005.07
2	For a series RL circuit with variable L, plot the locus of the current, mark the range of I for maximum and minimum values of X_C, and maximum power consumed in the circuit. Assume X_L=25Ω and R = 50 Ω. The voltage is 200 V, 50 Hz.	Understand	CAEE005.07
3	For a series RL circuit with variable L, plot the locus of the current, mark the range of I for maximum and minimum values of X_C, and maximum power consumed in the circuit. Assume X_L=30Ω and R = 75 Ω. The voltage is 230 V, 50 Hz.	Understand	CAEE005.07

4	For a series RL circuit with variable R, plot the locus of the current, mark the range of I for maximum and minimum values of R, and maximum power consumed in the circuit. Assume X_L=60Ω and R = 20 Ω. The voltage is 400 V, 50 Hz.	Remember	CAEE005.07
5	For a series RC circuit with variable X_C, draw the locus of the current, mark the range of I for maximum and minimum values of X_C. Assume X_C=50Ω and R = 10 Ω. The voltage is 400 V, 50 Hz.	Understand	CAEE005.07
6	For a series RC circuit with variable X_C, draw the locus of the current, mark the range of I for maximum and minimum values of X_C. Assume X_C=40Ω and R = 25 Ω. The voltage is 230 V, 50 Hz.	Understand	CAEE005.07
7	For the network shown in the figure,find the expressions for V_2/V_1, I_2/I_1. 	Understand	CAEE005.08
8	For the network shown in the figure, find the voltage transfer function V_2/V_1 	Understand	CAEE005.08
9	For the network shown in the figure, find the driving point function Z(s) and plot the poles and zeros of Z(s) on s-plane. 	Understand	CAEE005.08
10	Find the transfer impedance of the following circuit shown in figure 	Understand	CAEE005.08
11	The Laplace transform of a voltage v(t) is V(s)=50(s+1)/(s+2)(s+3). Draw poles and zeros of this function and determine v(t) using pole-zero plot	Understand	CAEE005.09

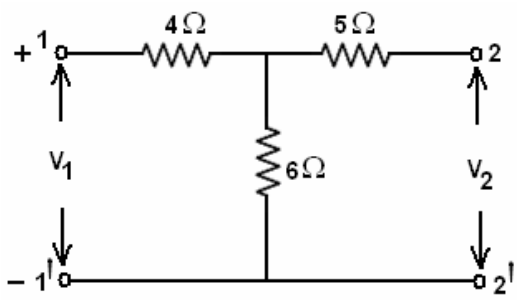
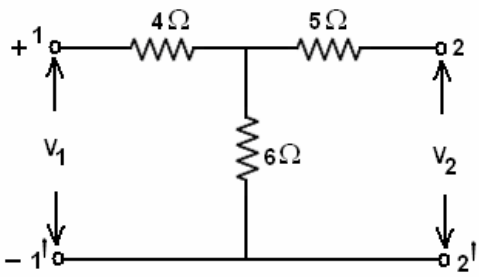
12	The transform voltage V(s) of a network is given by V(s) =s/(s+2)(s^2+2s+2) plot its pole-zero diagram and hence obtain v(t)	Understand	CAEE005.09
13	For the given network function draw pole zero diagram and hence obtain the time domain response i(t) if I(s) = 10S / (S+1)(s^2+4S+8)	Remember	CAEE005.09
14	Find the input impedance $Z_{in}(s)$ and plot its poles and zeros for the circuit shown. 	Understand	CAEE005.08
15	Find the driving point admittance function Y(s) for the network shown in figure and also plot the pole zero diagram. 	Understand	CAEE005.08

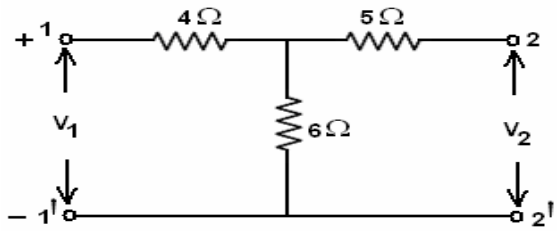
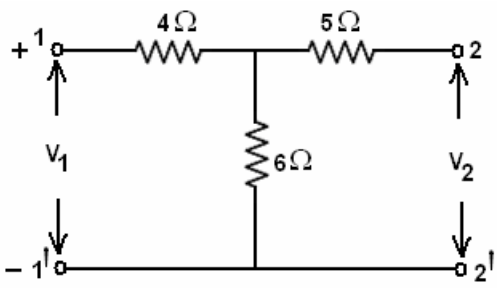
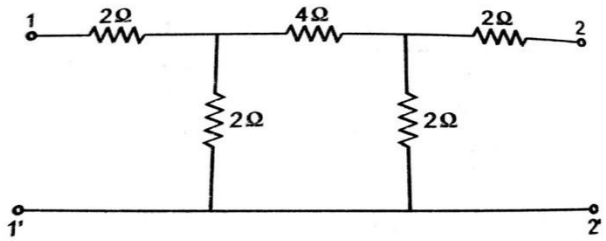
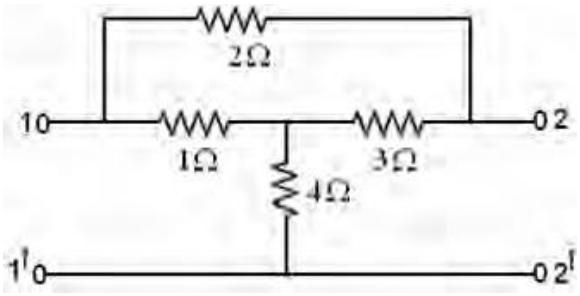
UNIT – IV

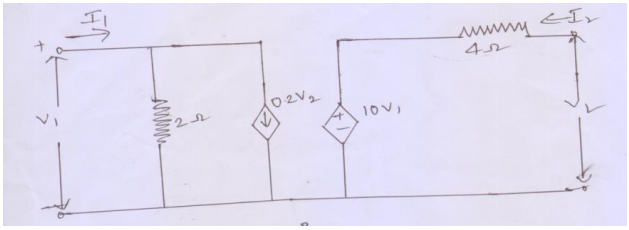
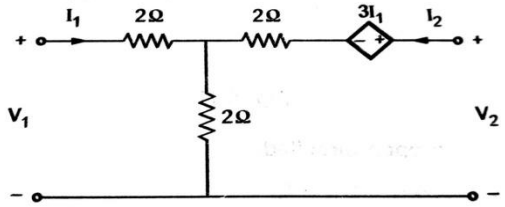
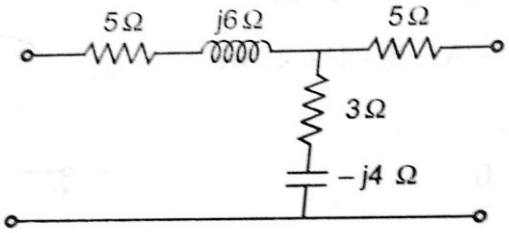
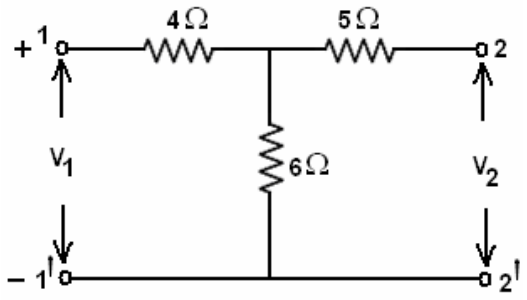
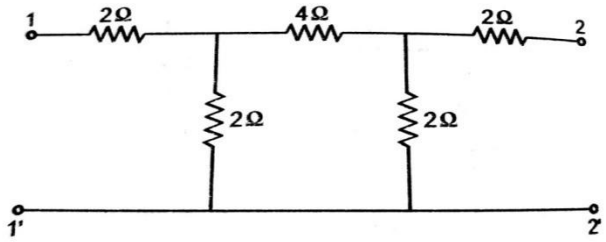
TWO PORT NETWORK PARAMETERS

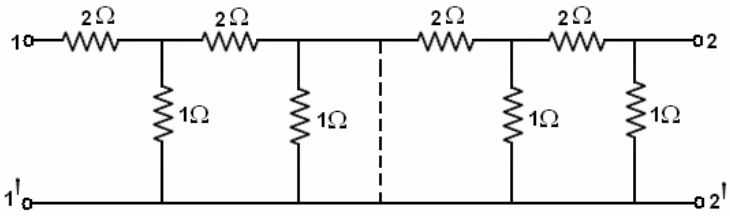
PART – A (SHORT ANSWER QUESTIONS)

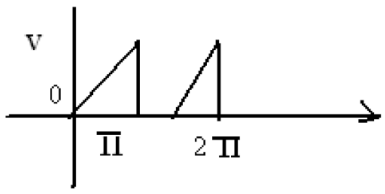
1	Define active and passive ports	Understand	CAEE005.10
2	Why Z-parameters are called as open circuit impedance (Z) parameter	Remember	CAEE005.10
3	Define open circuit forward transfer impedance.	Understand	CAEE005.10
4	Give the condition for reciprocity for Z parameters.	Understand	CAEE005.10
5	Give the condition for symmetry for Z parameters	Understand	CAEE005.10
6	Why Y parameters are called as short circuit admittance parameters.	Remember	CAEE005.12
7	What are the applications of cascaded ABCD parameters?	Remember	CAEE005.12
8	Express y-parameters in terms of h-parameters.	Understand	CAEE005.11
9	Express Z-parameters in terms of h-parameters.	Understand	CAEE005.11
10	Express Z parameters in terms of ABCD parameters.	Remember	CAEE005.11
11	Express h-parameters in terms of ABCD parameters.	Understand	CAEE005.11

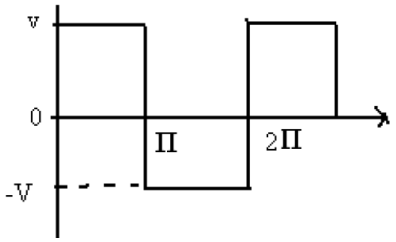
12	Define two port networks?	Remember	CAEE005.10
13	Define one port network?	Remember	CAEE005.10
14	Write the condition for a two port network to be reciprocal.	Understand	CAEE005.10
15	Which parameters are widely used in transmission line theory?	Understand	CAEE005.10
16	How can we obtain the h parameters of a circuit?	Understand	CAEE005.10
17	Give the equation for the transfer impedance of a two port network.	Remember	CAEE005.10
18	Write condition for reciprocity for ABCD parameters.	Remember	CAEE005.10
19	Give the condition for symmetry for Y parameters	Remember	CAEE005.10
20	Write condition for reciprocity for h parameters	Remember	CAEE005.10
PART – B (LONG ANSWER QUESTIONS)			
1	Write a short notes on (a) Z-parameters, (b) Y-parameters	Understand	CAEE005.10
2	Write a short notes on (a) ABCD parameters, (b) h-parameters	Remember	CAEE005.12
3	Derive the condition for symmetry (a) Z-parameters, (b) Y-parameters	Understand	CAEE005.11
4	Discuss in detail about series connection of two port networks.	Remember	CAEE005.12
5	Find the Z parameters of the circuit shown 	Understand	CAEE005.10
6	Find the h parameters of the circuit shown 	Understand	CAEE005.10
7	Determine the image parameters of a T network with branch impedances 1 ohm, 2 ohm and 5 ohm.	Understand	CAEE005.10
8	Explain image parameters with necessary expressions.	Understand	CAEE005.10
9	The Z parameters of a two port network are Z_{11} = 10 ohm, Z_{22} = 15 ohm, Z_{12}= 20 ohm, Z_{21} = 5 ohm. Find the equivalent T network.	Understand	CAEE005.11
10	The Z parameters of a two port network are Z_{11} = 10 ohm, Z_{22} = 15 ohm, Z_{12}= Z_{21} = 5 ohm. Find the ABCD parameters.	Understand	CAEE005.11
11	Obtain the expressions for Y parameters of when 2 two -port networks are connected in parallel.	Remember	CAEE005.12

12	Derive the condition for reciprocity for Z-parameters and Y-parameters.	Remember	CAEE005.12
13	Find the ABCD parameters of the circuit shown. 	Understand	CAEE005.10
	PART – C (ANALYTICAL QUESTIONS)		
1	Find the Y parameters of the circuit shown. 	Understand	CAEE005.10
2	Find Y-parameters for the network shown in the figure. 	Understand	CAEE005.10
3	For the following network shown in figure determine Z parameters 	Understand	CAEE005.10

4	Find the transfer admittance of the circuit given below 	Understand	CAEE005.10
5	Find the Z parameters of the circuit shown 	Remember	CAEE005.12
6	Obtain the ABCD parameters for the network shown in the figure. 	Understand	CAEE005.12
7	Find the h-parameters for the circuit in Figure. 	Understand	CAEE005.10
8	Find h-parameters for the network shown in the figure. 	Understand	CAEE005.10

9	Determine the ABCD parameters of two networks connected in cascade as shown.  	Remember	CAEE005.12
10	The Z parameters of a two port network are Z_{11} = 10 ohm, Z_{22} = 15 ohm, Z_{12}= Z_{21} = 5 ohm. Find the h-parameters.	Understand	CAEE005.10
UNIT – V			
FILTER CIRCUITS			
PART – A (SHORT ANSWER QUESTIONS)			
1	What is low pass filter derive expression for cutoff frequency of proto type low pass filter in terms of L and C?	Understand	CAEE005.13
2	Obtain design equations of high pass filter?	Remember	CAEE005.13
3	Draw a circuit of a band stop filter and explain its working with neat reactance curves?	Understand	CAEE005.13
4	For band stop filter show that resonant frequency is the geometric mean of two cutoff frequencies?	Understand	CAEE005.13
5	What are disadvantages of proto type filters?	Remember	CAEE005.13
6	Explain in brief m-derived filter section overcome limitations of proto type filter section?	Understand	CAEE005.13
7	Write notes on termination with m-derived half section?	Understand	CAEE005.13
8	Categorize filters and explain.	Understand	CAEE005.13
9	Write the design equations for proto type t section band stop filter.	Understand	CAEE005.13
10	Write the design equations for proto type t section band pass filter.	Remember	CAEE005.15
PART – B (LONG ANSWER QUESTIONS)			
1	Define a filter and what are the classifications of filters?	Understand	CAEE005.13
2	Explain the formula for characteristic impedance of symmetrical T-Section.	Understand	CAEE005.13
3	Explain the design procedure for a constant K low pass filter and its characteristics.	Remember	CAEE005.13
4	Explain the design procedure for a constant K high pass filter and its characteristics.	Understand	CAEE005.13
5	Explain the design procedure for band pass filter and draw its characteristics.	Understand	CAEE005.13
6	Explain the design procedure for band stop filter and draw its characteristics.	Remember	CAEE005.15
7	Design m-derived high pass filter and draw its characteristics.	Remember	CAEE005.15
8	Write short notes on Fourier series	Remember	CAEE005.15

9	Design m-derived low pass filter and draw its characteristics.	Remember	CAEE005.15
10	Explain the formula for characteristic impedance of symmetrical π-Section.	Understand	CAEE005.14
PART – C (ANALYTICAL QUESTIONS)			
1	Design a low pass filter (both T and π sections) having a cutoff frequency of 2 KHz to operate with a terminated load resistance of 500Ω.	Understand	CAEE005.13
2	Draw the circuit diagram of a Band pass filter. Explain the design procedure of the above filter in detail. Simulate the same using Matlab.	Understand	CAEE005.14
3	Design a constant K band elimination filter with cut off frequency 1750 Hz to 4250 Hz and a characteristic impedance of 250Ω.	Understand	CAEE005.13
4	Draw the circuit diagram of a Band pass filter. Explain the design procedure of the above filter in detail. Simulate the same using Matlab.	Understand	CAEE005.14
5	Draw the circuit diagram of a High pass filter. Explain the design procedure of the above filter in detail. Simulate the same using Matlab.	Understand	CAEE005.14
6	Draw the circuit diagram of a Low pass filter. Explain the design procedure of the above filter in detail. Simulate the same using Matlab.	Understand	CAEE005.14
7	Design a proto type section of band pass filter having cut-off frequencies of 12KHz and, 16 KHz and a design impedance of 600 ohm.	Understand	CAEE005.13
8	Design a low pass filter (both T and π sections) having a cutoff frequency of 2 KHz to operate with a terminated load resistance of 500Ω	Understand	CAEE005.13
9	Find the component values of a constant K LPF having characteristic impedance Z0= 500Ω and cut off frequency of f = 500 Hz. Find the frequency at which this filter produces an alternation constant of 38.2 dB	Understand	CEE005.13
10	Design a proto type section of band pass filter having cut-off frequencies of 12KHz and 16 KHz and a design impedance of 600 ohm	Understand	CEE005.13
11	A constant K low pass filter is designed to cut off at a frequency of 1000Hz and the resistance of the load circuit is 50ohm .Calculate the values of the corresponding components required	Remember	CEE005.15
12	A constant K high pass filter is designed to cut off at a frequency of 1000Hz and the resistance of the load circuit is 600ohm .Calculate the values of the corresponding components required	Remember	CEE005.15
13	Design a proto type section of band stop filter having cutoff frequencies of 2KHz and, 6 KHz and a design impedance of 600ohm	Remember	CEE005.15
14	Design a proto type section of band pass filter having cutoff frequencies of 1KHz and, 5 KHz and a design impedance of 600ohm	Understand	CEE005.14
15	Find the trigonometric Fourier series for the wave shown in fig. and plot the spectrum. 	Remember	CAEE005.15

16	Find the exponential Fourier series for the waveform shown in figure.  	Remember	CAEE005.15
17	Design a constant K band elimination filter with cut off frequency 1750 Hz to 4250 Hz and a characteristic impedance of 250Ω.	Understand	CAEE005.13
18	Find the component values of Π-section & T-section constant-K high pass filter having a cut off frequency of 8 kHz and nominal characteristic impedance of 500Ω.	Understand	CAEE005.13

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