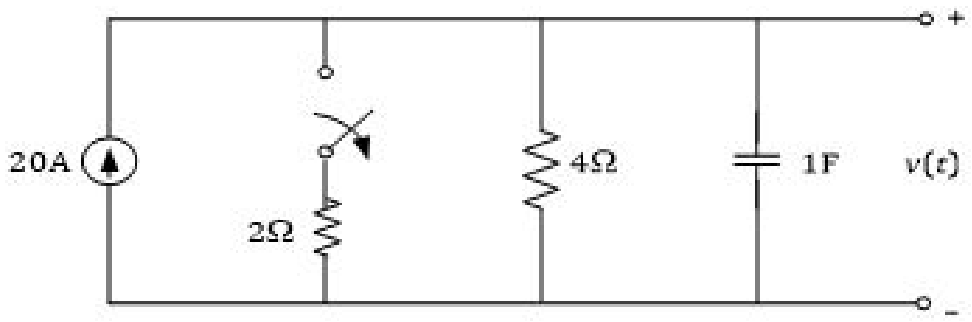
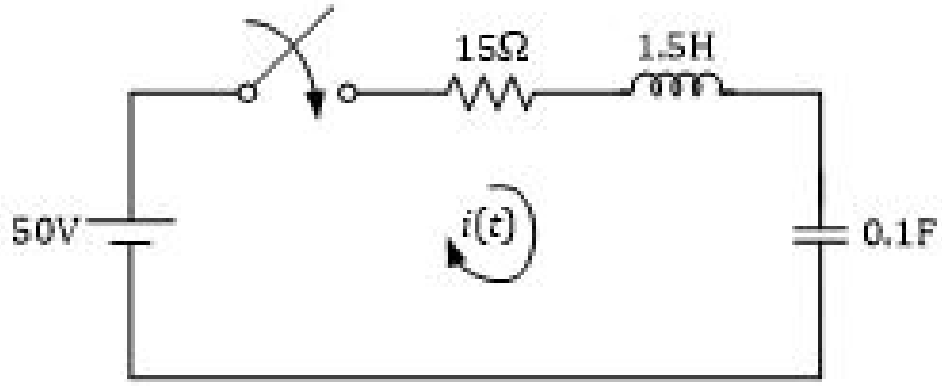
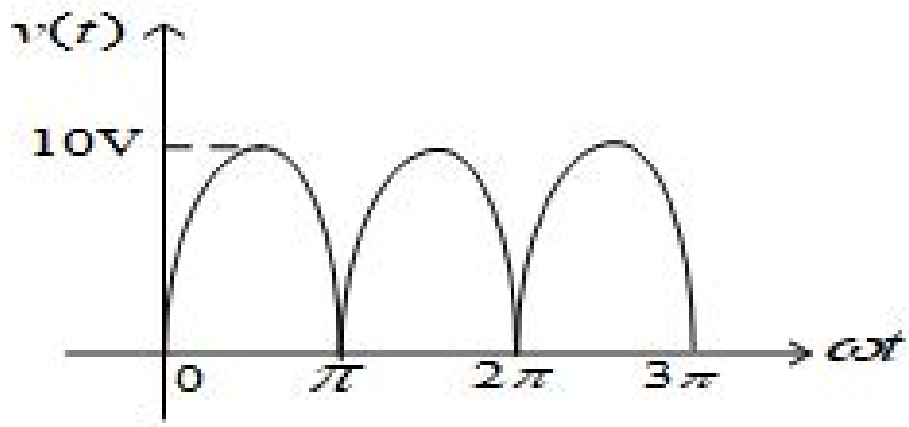
KONERU LAKSHMAIAH EDUCATION FOUNDATION
(Deemed to be University, Estd. u/s. 3 of UGC Act 1956)

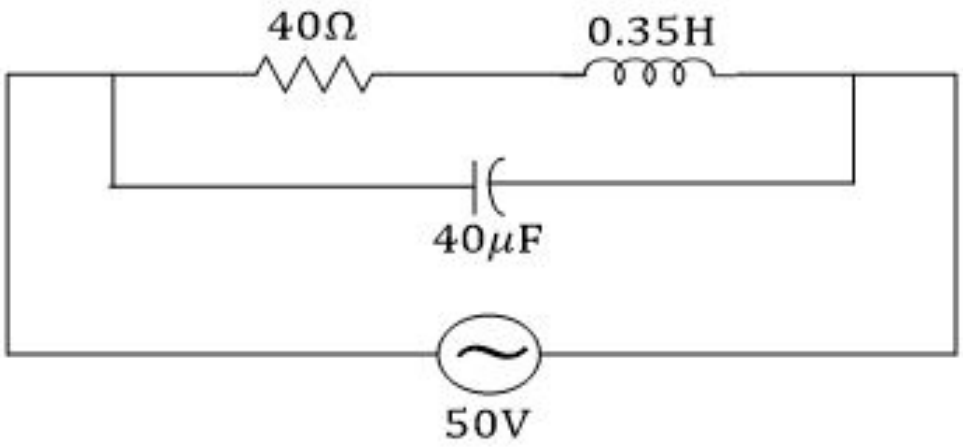
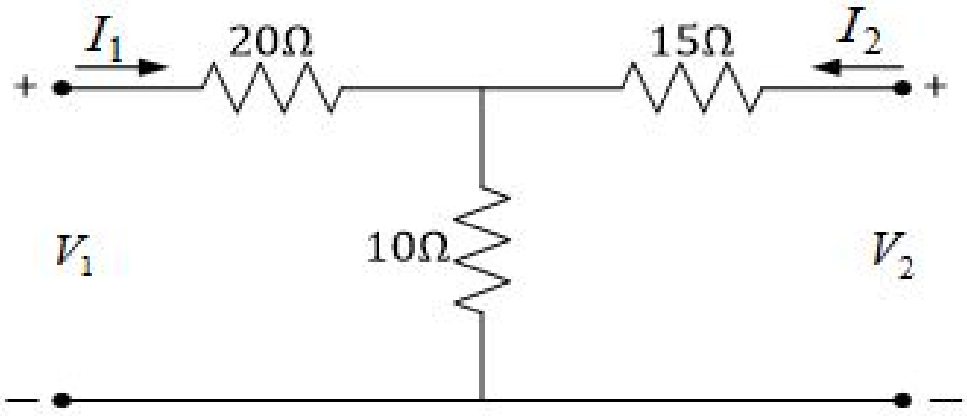
B.Tech - Odd Sem : End Semester Exam
Academic Year:2020-2021

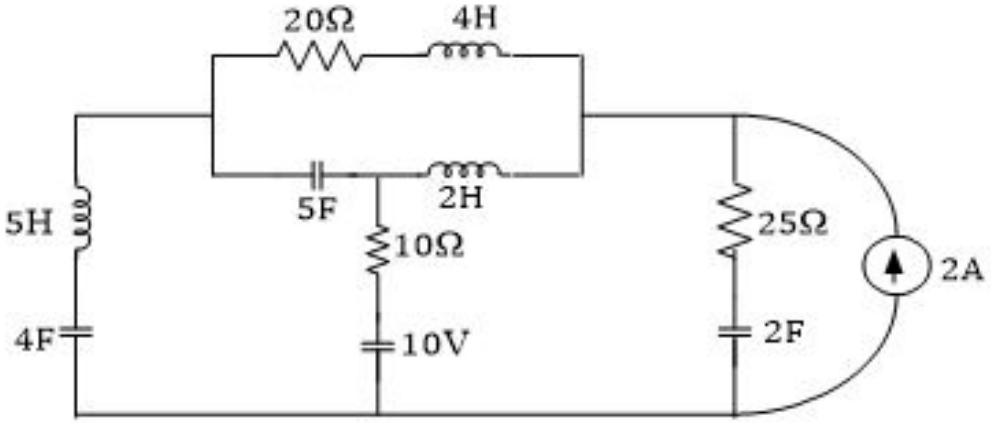
19EE2101 - ELECTRICAL CIRCUITS

Set No: 2

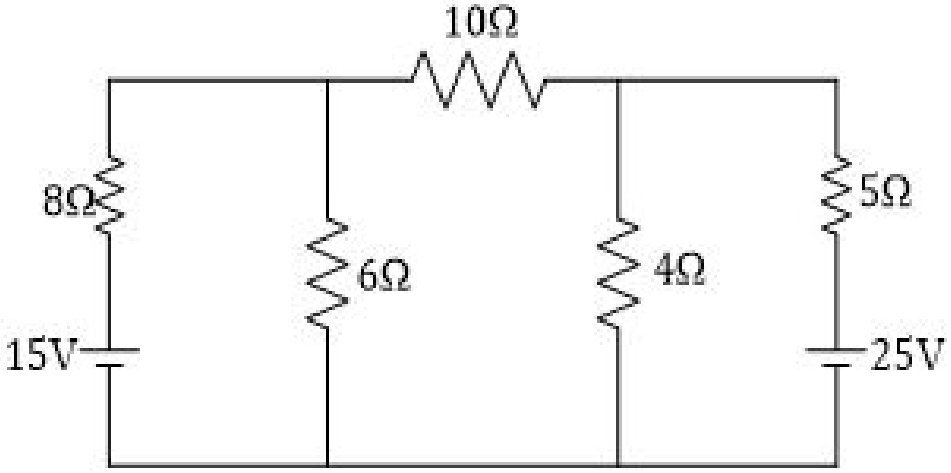
Time: **Max.Marks: 100**

S.NO	Answer All Questions	Choice	Options	Marks	CO
1.	Derive an expression for current i(t) of a series RC circuit excited by a dc source of V volts at t=0. A series circuit consists of a resistor of 40Ω and a capacitor of 0.4F. A constant voltage of 40V is applied to the circuit at Obtain the equation for current. Determine the voltage across the resistor and capacitor.	choice Q-2		10Marks	CO1
2.	For the network shown in Figure below, the switch is opened at t=0. Find v(t) for t>0. 			10Marks	CO1
3.	In the network shown in Figure below, the switch is closed at t=0. Obtain the expression for current i(t) for t>0. . 	choice Q-4		15Marks	CO1
4.	Derive an expression for the step response of a series RL circuit using Laplace transform. A series RLC circuit with R=2Ω, L=1H, and C=0.2F is excited by a dc source of 5V at t=0. Find the current for t>0.			15Marks	CO1
5.	Find the average value, rms value and the form factor of the full wave rectified sine wave shown in Figure below. 	choice Q-6		10Marks	CO2
6.	A sine wave of v(t)=250 sin100t is applied to an impedance consisting of a resistor of 20Ω in series with a capacitor. The reading of a voltmeter across the resistor is 150V and across the capacitor is 90V. Calculate the power factor of the circuit. Also calculate the power, reactive volt amperes and apparent power in the circuit.			10Marks	CO2

7.	Three equal impedances each of (10+j12)Ω are connected in star. This is further connected to a 400V,50Hz three-phase supply. Calculate (a)phase voltage (b)phase current (c)line current (d)phase angle (e)active power (f)reactive power and (g)apparent power.	choice Q-8		15Marks	CO2
8.	A three-phase 440V, four-wire system has a star-connected load with ZR=(8+j12)Ω, ZY=(18+j14)Ω, ZB=(6+j10)Ω. Find the line currents and current through neutral conductor.			15Marks	CO2
9.	A series RLC circuit consists of a 50Ω resistance, 0.2H inductance and 20μF capacitance with an applied voltage of 60V. Determine (a) the resonant frequency (b) the Q factor of the circuit (c) the lower and upper cutoff frequencies and (d) the bandwidth of the circuit.	choice Q-10		10Marks	CO3
10.	Derive an expression for the resonant frequency of a tank circuit. For the tank circuit shown in Figure below, find the resonant frequency. 			10Marks	CO3
11.	Two coils with a coefficient of coupling of 0.6 between them are connected in series so as to magnetize (a)in one combination in the same direction and (b)in another combination in the opposite direction. The corresponding values of equivalent inductance are 4H and 2H respectively. Find the self-inductance of the two coils and the mutual inductance between them.	choice Q-12		15Marks	CO3
12.	Find the equivalent inductance of two coils coupled in parallel aiding. A coil of inductance 400mH is magnetically coupled to another coil of inductance 900mH. The coefficient of coupling between the coils is 0.8. Calculate the equivalent inductance of the following circuit combinations: (a)series aiding (b)series opposing (c)parallel aiding and (d)parallel opposing.			15Marks	CO3
13.	Distinguish between passive and active ports. Give an example of each. Define y- parameters of a two-port network. Determine the admittance parameters of the T network shown in Figure below. 	choice Q-14		10Marks	CO4
14.	Obtain z -parameters in terms of hybrid parameters. Given h parameters as below. Compute the z-parameters, and write the describing equations. $\begin{bmatrix} h_{11} & h_{12} \\ h_{21} & h_{22} \end{bmatrix} = \begin{bmatrix} 4 & 3 \\ 2 & 6 \end{bmatrix}$			10Marks	CO4
15.	Discuss about tree and its properties . For the circuit shown in Figure below, (a) draw its oriented graph and write its (b)incidence matrix (c) tie set matrix and (d)fundamental cutest matrix.	choice Q-16		15Marks	CO4



16. For the network shown in Figure below, obtain network equilibrium equations on node basis using KCL.



15Marks CO4

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