

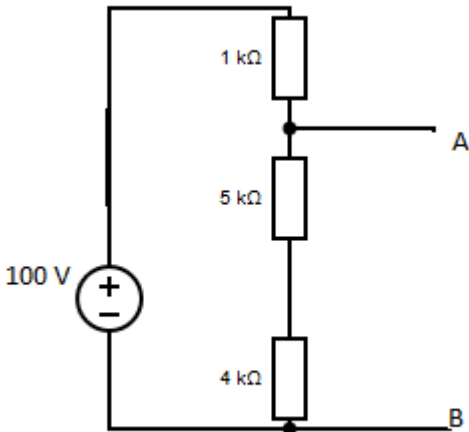


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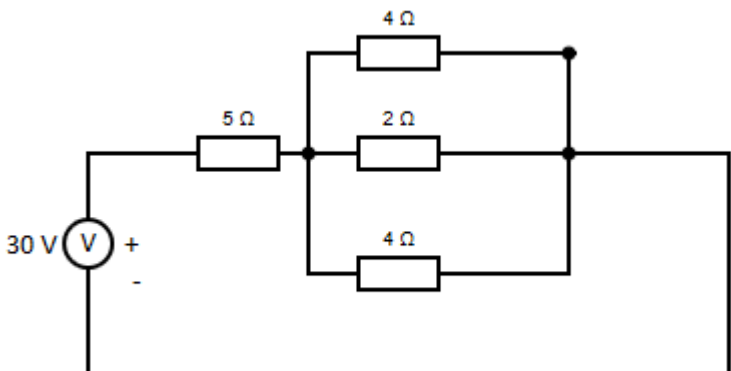
End Semester Examination – Nov/Dec - 2016

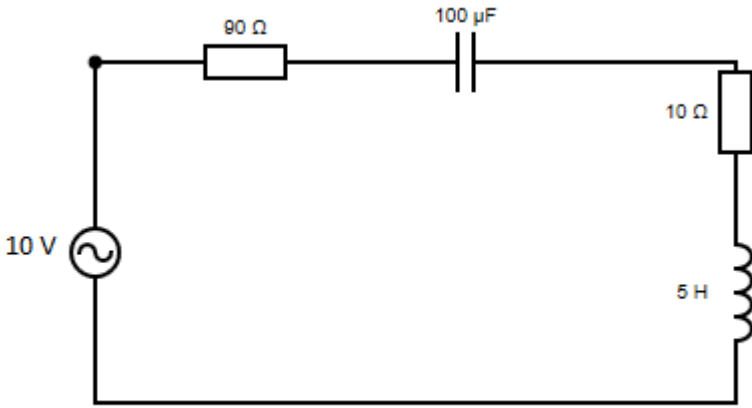
Code : **10EC202**
Sub. Name : **Electric Circuit Analysis**

Semester : **2016-17 ODD**
Duration : **3 hrs**
Max. marks : **100**

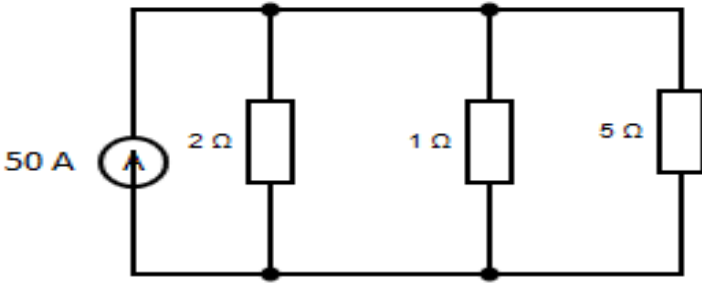
Q. No.	Questions	Marks
PART-A(10X1=10 MARKS)		
1.	A $5\ \Omega$ resistor is connected across a 12 V battery. How much current flows through the resistor?	(1)
2.	Find the voltage between A and B in a voltage divider network 	(1)
3.	What is a phasor?	(1)
4.	Obtain the frequency of the signal defined by $v(t) = 50\sin(10t)$	(1)
5.	When two coils are arranged in aiding connection, the inductance of the combination is-----	(1)
6.	Coefficient of coupling of an ideal transformer is _____	(1)
7.	Mention the condition for maximum power to be transferred to the load according to maximum power transfer theorem.	(1)
8.	Superposition theorem can be applied only for linear circuits. (True/False).	(1)
9.	Transients are due to the presence of energy storing elements in the circuit – True or False	(1)
10.	Define Transient time.	(1)

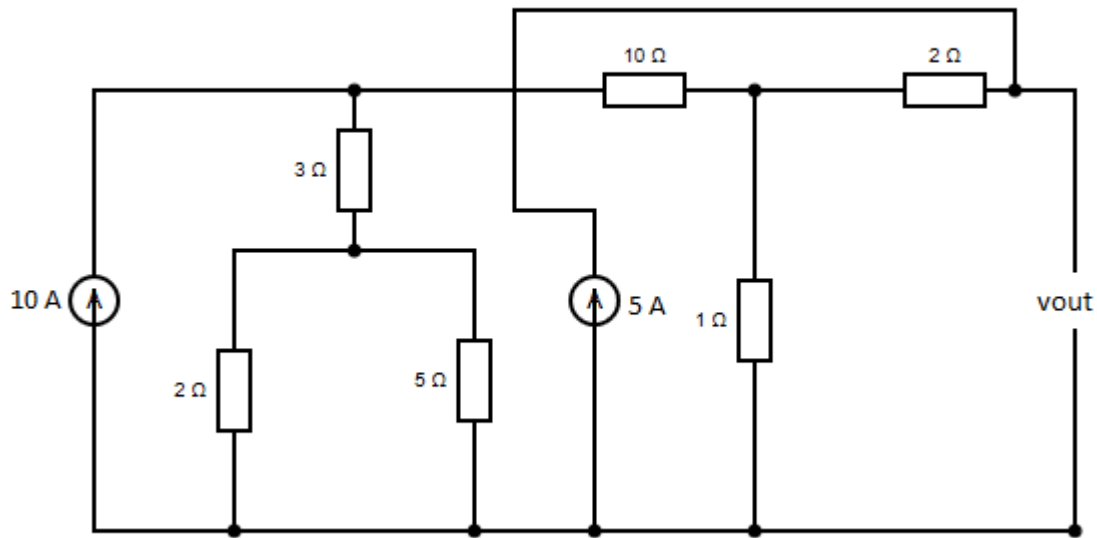
PART B(5 X 3= 15 MARKS)

11	Determine the total current in the circuit 	(3)
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12	Determine the value of Q at resonance frequency and also find the bandwidth of the circuit	(3)
		
13	Two coils connected in series have an equivalent inductance of 0.4H when connected in aiding and an equivalent inductance 0.2 H when the connection is opposing. Calculate the mutual inductance of the coils	(3)
14	State Norton's Theorem	(3)
15	A D.C voltage of 100 volts is applied to a series RL circuit with $R=25\ \Omega$, $L=1\ \text{H}$. what will be the time constant?	(3)

PART C(5 X 15= 75 MARKS)

16.	a.	Determine the current in all resistors in the circuit.	(12)
			
	b.	State Kirchoff's laws	(3)
(OR)			
17.	a.	Determine the output voltage V_{out} in the circuit	(15)



18. a. A voltage $v(t)=10\sin(\omega t)$ is applied to a series RLC circuit. At the resonant frequency of the circuit, the maximum voltage across the capacitor is found to be 500 V. Moreover, the bandwidth is known to be 400 rad/sec and the impedance at resonance is 100 ohm. Find the resonant frequency. Also find the values of L and C of the circuit

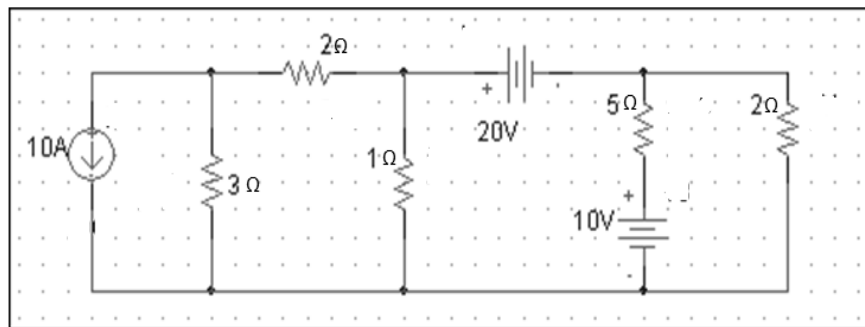
(OR)

19. a. A 400 V three phase supply feeds an unbalanced three wire star connected load. The branch impedances of the load are $Z_R=(4+j8)\Omega$; $Z_Y=(3+j4)\Omega$; and $Z_B=(15+j20)\Omega$. Find the line currents and voltages across each phase impedance. Assume RYB phase sequence.

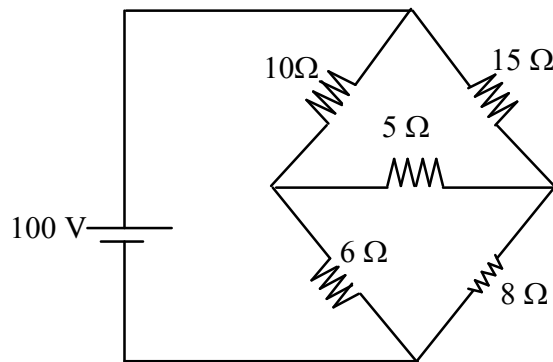
20. a. Derive the input impedance of the ideal transformer using turns ratio

(OR)

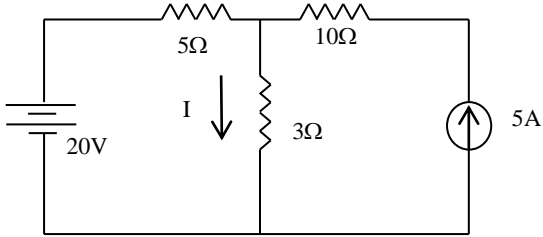
21. a. Determine the current in the 5Ω resistor using super node analysis for the circuit shown.



22. a. Apply Thevenin's theorem to determine the current through 5Ω resistor in the circuit shown



(OR)

23.	a.	Using superposition theorem, find the current in 3Ω resistor shown in the figure.	
			
24.	a.	A series RLC circuit with $R=20\Omega$, $L=0.05\text{H}$, $C=20\mu\text{F}$ has a constant voltage of 100V applied to it at $t=0$. Find the current transient.	(15)
(OR)			
25.	a.	A series RC circuit consists of resistor of 10 ohm and capacitor of 0.1 farad. A constant voltage of 20 V is applied to the circuit at $t = 0$. Obtain the current equation and determine the voltage across the resistor and the capacitor.	(15)

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