

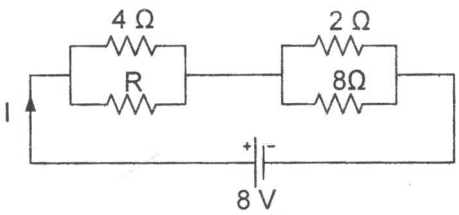
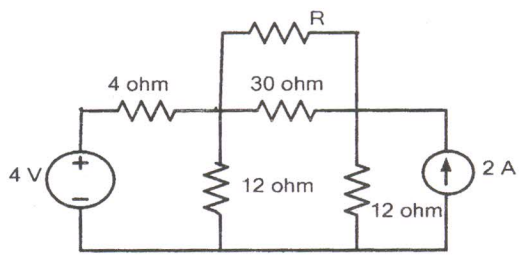
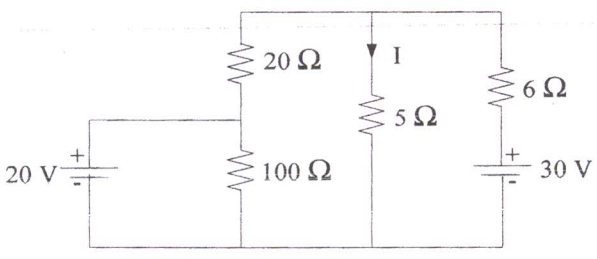
**College of Engineering, Pune**  
**End Semester Exam – Nov. 2013**  
**F. Y. B. Tech. (NE)**  
**Basic Electrical Engineering EE-101**

Day & Date: Tuesday, 19<sup>th</sup> Nov. 2013  
 Maximum Marks: 60

Time: -10.00 am to 1.00 pm.  
 Duration – 3 hrs.

**Instructions:**

1. All questions are compulsory and carry equal marks.
2. All questions must be attempted sequentially 1 to 5.
3. Sub-questions of each question must be attempted at one place.
4. All the symbols and notations carry their usual meaning unless otherwise stated.
5. Assume suitable data wherever necessary.

<b>Q. 1</b>	<b>A</b>	<p>If the total power dissipated in the circuit shown in Fig. 1 A is 16 W, calculate the value of R and the total current.</p> <div style="text-align: center;">  <p>Fig. 1 A</p> </div>	5
	<b>B</b>	<p>For the circuit shown below in Fig. 1 B, find the Thevenin's equivalent as viewed by the resistance R.</p> <div style="text-align: center;">  <p>Fig. 1 B</p> </div>	5
	<b>C</b>	<p>Define temperature coefficient of resistance. On what parameters does its value depend?</p>	2
<b>Q. 2</b>	<b>A</b>	<p>Use the superposition theorem to find current I in the circuit shown in Fig.2 A. (Without using source transformation).</p> <div style="text-align: center;">  <p>Fig.2 A</p> </div>	6

	B	A resistance of a coil increases from $16 \Omega$ to $20 \Omega$ when its temperature increases from $20^{\circ}\text{C}$ to $70^{\circ}\text{C}$ . What will be the temperature coefficient of resistance and temperature when the resistance increases to $24 \Omega$ ?	6
Q. 3	A	Determine the currents in various resistances of the network of Fig.3A. Use mesh analysis.	5
		Fig.3A	
	B	Give the classification of induced emf in electromagnetic systems. Comment on the nature of emf induced in case of: i) Transformer                      (ii) dc machine	5
	C	The current in a coil decreases from $10 \text{ A}$ to $4 \text{ A}$ in $0.1$ second. If the inductance of the coil is $4 \text{ H}$ , find the emf induced in the coil.	2
Q. 4	A	A balanced delta connected load with impedances of $(12+j16) \Omega$ per phase connected to a $400 \text{ V}$ , 3-phase supply. Determine the line current and the power drawn by the load.	6
<b>OR</b>			
	A	A non-ideal inductive circuit supplied with $100 \text{ V}$ at $50 \text{ Hz}$ is found to take $10 \text{ A}$ and when supplied with $100 \text{ V}$ at $200 \text{ Hz}$ , it takes $5 \text{ A}$ . Determine the circuit constants assuming sinusoidal current.	6
	B	A ring having a mean diameter of $21 \text{ cm}$ and a cross-sectional area of $10 \text{ cm}^2$ is made up of semicircular sections of cast steel with each joint having an air gap of $0.2 \text{ mm}$ , as shown in the Fig. 4 B. Determine the ampere turns required to produce a flux of $0.8 \text{ mWb}$ . The relative permeability of cast iron and cast steel are $166$ and $800$ respectively. Neglect fringing and leakage effects.	6
		Fig. 4 B	
Q. 5	A	Describe the main parts of a transformer used in power circuits.	4
	B	What are the different types of a dc motor? Give one application of each with justification.	4
	C	With the help of neat diagram, explain the working of fluorescent tube.	4