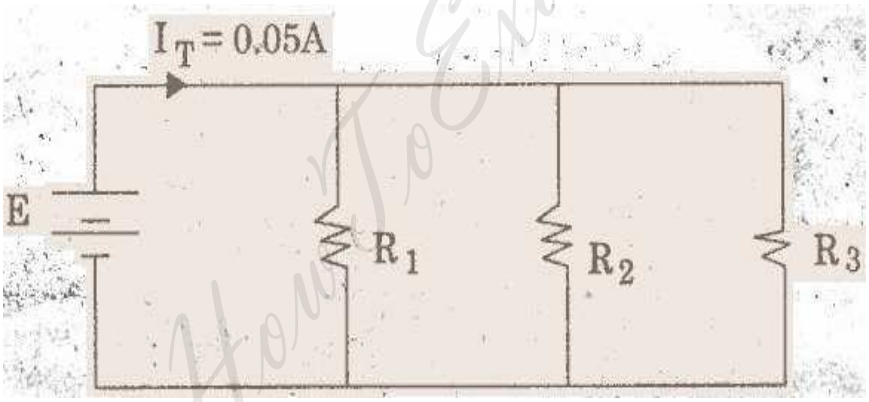
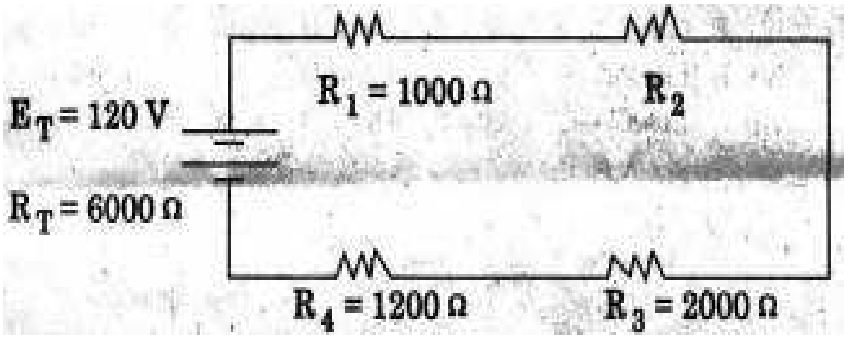
TML031/EE/20070812

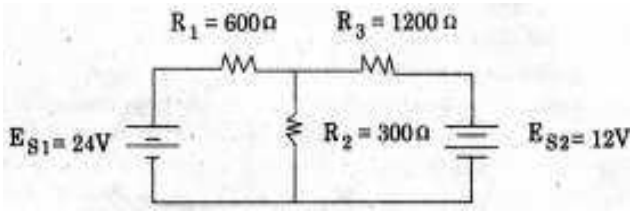
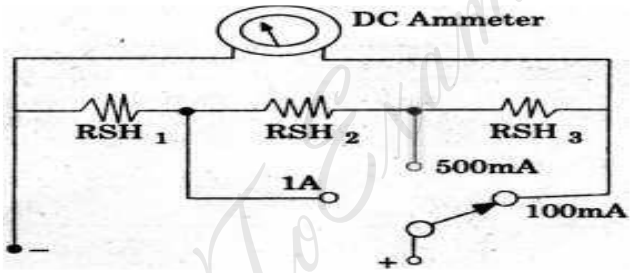
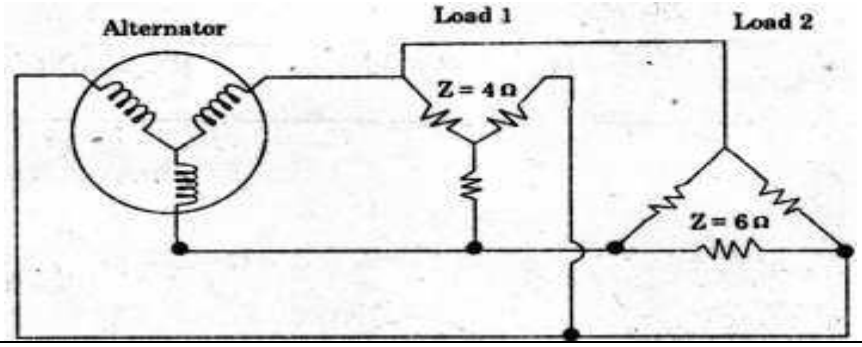
Basic Electrical Engineering

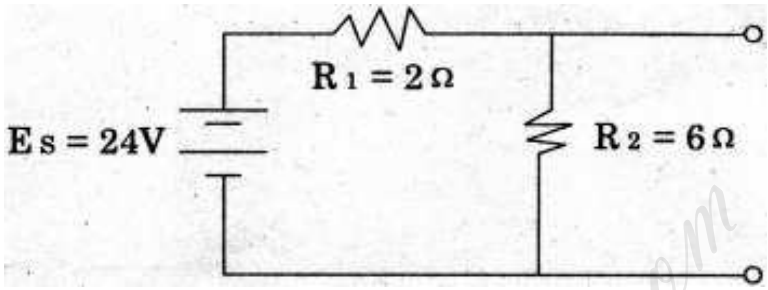
Time : 180 minutes **Marks : 100**

Instructions for the students :

1. All questions are compulsory.
2. "Long Answer type Question (LAQ)" is a supply type question of 20 marks, which require typical answer of about 60-80 lines in about 32-40 minutes.
3. "Short Answer type Question (SAQ)" is a supply type question of 5 marks, which require typical answer of about 15-20 lines in about 08-10 minutes.
4. Use of non-programmable type of scientific calculator is allowed.
5. Draw neat diagrams wherever necessary.
6. Assume suitable data if necessary.

Q. No.	Question (Q)	Question Marks
	Long Answer type Questions (LAQ's)	
1.	(a) Find the current flowing through each resistor for given circuit. Resistor R_1 is producing 0.075 W of heat, R_2 is producing 0.45 W if heat and R_3 is producing 0.225 W of heat. The circuit has total current of 0.05 A. 	**10**
	(b) Find the voltage across each resistor for a given series circuit. 	**10**

Q. No.	Question (Q)	Question Marks
2.	(a) State superposition theorem. Find the current through R_2 in given circuit using super position theorem.  (b) State Kirchhoff's voltage and current law. Explain with an example.	**15** **5**
3.	(a) Calculate the resistor values for an Ayrton shunt for 1A, 500 mA and 100 mA range. The meter movement has full scale values of 50 mV, 1 mA and 50 Ω of resistance.  (b) Explain the measurement of unknown resistance using Wheatstone bridge.	**15** **5**
4	(a) The phase windings of an alternator are connected in wye. The alternator produces a line voltage of 440V and supplies power to two resistive loads. One load contains resistors with a value of 4 Ω each, connected in wye. The second load contains resistors with a value of 6 Ω each connected in delta. Find- i) EL (Load 2) ii) Ep (Load 2) iii) Ip (Load 2) iv) IL (Load 2) v) Ep (Load 1) vi) Ip (Load 1) vii) IL (Load 1) viii) IL (Alt) ix) Ep (Alt) x)True power P.  	**20**

	Short Answer type Questions (SAQ's)	
5.	(a) State the Coulomb's law. (b) Define Volt Amp (VA)	**2** **3**
6.	Convert the given circuit into its Thevenin's equivalent circuit.  	**5**
7.	Write a short note on Wattmeter.	**5**
8.	A sine wave has a maximum voltage of 350 V. At what angle of rotation will the voltage reach 53 V ?	**5**