MID SEMESTER EXAMINATION **MARCH-2012**

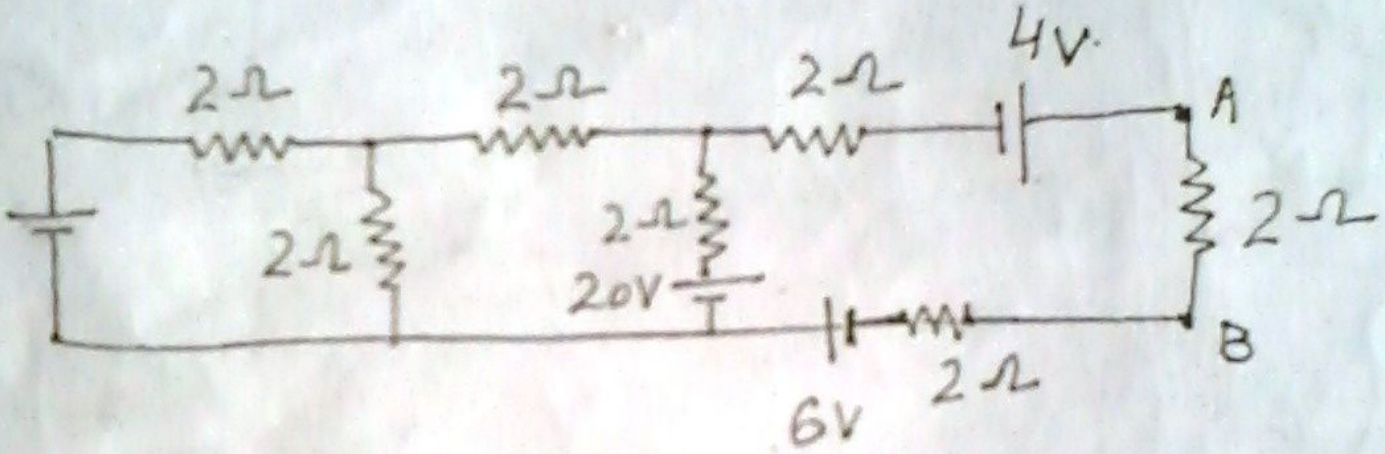
EE-105 ELECTRICAL SCIENCES

Time: 1 Hour 30 Minutes *Max. Marks : 20*

Note : Answer **ALL** questions.
Assume suitable missing data, if any.

1[a] State and explain Tellegen's theorem (two statements) with example. **2**

[b] Determine the current through the resistance of 2Ωconnected across AB, using Thevenin's theorem, shown in Fig.1 **4**



2[a] A potential difference of $100+200\sqrt{2}$ sin 314t is applied to a circuit having a resistance of 10Ω in series with a reactance of 15.7Ω. Find the power expended and the impedance and power factor of the circuit. **3**

[b] A coil of 20Ω resistance has an inductance of 0.2H and is connected in parallel with 100μF capacitor. Calculate the frequency at which the circuit will act as a non-inductive resistance of 'R' ohms. Find also the value of R. **3**

3[a] An electric iron is marked 230V, 500W. What current does it take if connected to the 200V voltage source? What is hot resistance? If the iron is used for one hour daily for 30 days in a month, what will be the monthly bill at Rs. 4.50 per unit, if the iron is connected to (i) 230V and (ii) 200 V respectively? **3**

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