Nepal College of Information Technology

**Unit Test**

Fall 2013

Program : BE Time : 2 hrs

Semester : (I) FM : 70

Subject : Basic Electrical Engineering PM : 35

* *Candidates are requested to give their answer as far as practicable in their own words.*
* *The figure in the margin indicates the full marks*
* ***Attempt ALL question***

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| 1(a) | Find the mesh currents I1, I2 and I3 in the circuit given below using mesh analysis.  ` | 7 |
| (b) | State superposition theorem. Calculate current flowing through 6Ω resistor using superposition theorem. | 8 |
| 2(a) | Use thevenin’s theorem to calculate current flowing through 5Ω resistance. | 7 |
| (b) | Find out the magnitude and direction of current flowing through the 2Ω resistance. | 8 |
| 3(a) | Find the average value and the root mean square value (RMS) of the following voltage from the half wave rectifier. | 7 |
| (b) | Two impedance of (10+j5) and (20+j30) are connected in series across a 200 V, 50 Hz supply. Find current, active power, reactive power, apparent power and power factor. Also draw the phasor diagram. | 8 |
| 4(a) | A series RLC circuit has 10Ω resistance, 0.01H inductance and 100µF capacitor. A 100V supply with the variable frequency is applied to the circuit and tuned until resonance occurs. Find the resonant frequency, bandwidth and quality factor, current drawn by the circuit and voltage across inductor at resonance condition.  **OR**  Find the average value, effective value, form factor, crest factor of a sinusoidal waveform. | 7 |
| (b) | Show that bandwidth of series RLC resonance circuit is R/L rad/s where symbol has their usual meaning. | 8 |
| 5 | Write short notes on (Any two)   1. power factor and its significance 2. Norton’s theorem 3. Energy sources | 10 |