

**I B.Tech Year(R07) Supplementary Examinations, May/June 2010**  
**ELECTRICAL CIRCUITS ANALYSIS**  
**(Electrical & Electronic Engineering)**

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. Six bulbs are connected in parallel across the 110V. Each bulb is rated at 75W. How much current flows through each bulb, and what is the total current? [16]
2. State Faraday's law of Electromagnetic Induction. Two coils A & B are wound on same ferromagnetic core. There are 300 turns on A & 2800 turns on B. A current of 4A through coil A produces a flux of  $800\mu\text{Wb}$  in the core. If this current is reversed in 20 ms, find the average emf induced in coils A & B. [16]
3. Why the rms values of an alternating quantity is more important than its average value. Find the rms value of the resultant current in a conductor which carries simultaneously sinusoidal alternating current with a maximum value of 15A and direct current of 15A. [16]
4. A 3-phase 74.6 KW delta connected induction motor is supplied by a 3-phase star connected alternator generating 1000V between the phases. If the full load efficiency is 92% and the power factor is 0.85 for an induction motor, calculate the current in each phase of the motor and the current in each alternator phase. [16]
5. A non-inductive resistor of  $12\Omega$  requires a current of 5A. However the available low voltage supply is only 100V, 50Hz. To cut down the voltage to suit the resistor, a choke coil of effective resistance  $2\Omega$  and inductance L henry has been connected in the circuit. Calculate [16]
  - (a) The inductance of the choke coil,
  - (b) Reactance of the choke coil.
  - (c) Power factor of the circuit.
  - (d) The total power absorbed.
6. Two coils A and B have resistance of  $12\Omega$  and  $6\Omega$  and inductances of 0.02 and 0.03H respectively. These are connected in parallel and a voltage of 200V at 50Hz is applied to their combination. Find [16]
  - (a) Current in the each coil.
  - (b) The total current and the
  - (c) The power factor of the circuit.
7. Derive an expression for the current response in  $R_L$  series circuit with a sinusoidal source. [16]
8. Explain network conversions. [16]

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