Code :R7310204 **R7**

III B.Tech I Semester(R07) Supplementary Examinations, May 2011
POWER ELECTRONICS
(Common to Electrical & Electronics Engineering, Electronics & Control Engineering)
Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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1. Discuss the dynamic (turn on and turn off) characteristics of SCR.
2. (a) Explain the importance of snubber circuit and derive the expression of capacitor, resistor used in snubber circuit.
   (b) Write a short note on specification and ratings of SCR's.
3. Discuss the operation of single phase semiconverter and derive the output voltage expression.
4. A single phase full converter feeding RLE load has the following data. Source voltage V_s=230V, 50Hz, R = 2.5 Ω, E =100V, Firing angle = 30^0.
   If load inductance is large enough to make load current virtually constant, then compute the average value of load.
5. (a) A single phase semi converter delivers to RLE load with R=5Ω, L = 10mH and E = 80V. The source voltage is 230V,50Hz. For continuous conduction, Find the average value of output current for firing angle $\alpha = 50^0$.
   (b) In above case draw a rough sketch of output voltage, current and source current.
6. Explain the operation of cyclo converter (stepdown) considering R_1RL loads and mark the conduction intervals of switch on the output waveform.
7. (a) Derive the expression of ripple current when a dc motor is fed by stepdown chopper.
   (b) Obtain the value of duty ratio where this ripples is maximum.
8. A single phase full-bridge inverter has RLC load of R = 4Ω, L = 35mH and C = 155μF. The dc input voltage of 230V and the output frequency is 50 Hz. Find the expression for load current upto fifth harmonic. Also calculate rms value of all the (fundamental, harmonic) current components.

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