

Code :RR310204

RR

III B.Tech I Semester(RR) Supplementary Examinations, May 2011
POWER ELECTRONICS

(Electrical & Electronics Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

1. (a) Explain the necessity of series and parallel connection of SCRs.
 (b) What is String efficiency in series and parallel connections.
 (c) What are the problems arising in series and parallel connections.
2. Explain the operation of single phase fully-controlled bridge converter with RL loads for discontinuous and continuous current modes. Draw circuit and necessary waveforms for $\alpha = 60^\circ$.
3. A three phase semi conductor is operated from a three phase star connected 220V, 60Hz supply. The load current is continuous and has negligible ripple. The average load current is $I_{dc} = 150\text{A}$ and commutating inductance per phase is $L_c = 0.5\text{mH}$. Determine the overlap angle if
 (a) $\alpha = \pi/6$
 (b) $\alpha = \pi/3$
4. For a single phase ac voltage controller fed from a single phase source and is controlling power to R-load, derive the expressions for rms output voltage, rms output current and line power factor.
5. Explain the operation of single phase bridge type cyclo converter for RL loads and for continuous conduction with neat circuit diagram and necessary output waveforms for $f_0 = 1/4 f_s$.
6. A load commutated chopper, fed from a 230V dc source has a constant load current of 50A. For a duty cycle of 0.4 and a chopping frequency of 2 KHz, Calculate
 (a) the value of commutating capacitance
 (b) average output voltage
 (c) circuit turn-off time for one SCR pair
 (d) total commutation interval
7. What type of commutation technique is used in single phase series inverter, explain the commutation procedure with the help of neat circuit diagram and necessary waveforms.
8. (a) What are the different pulse width modulation techniques used for inverters.
 (b) Which of the schemes gives better quality of voltage and current.
