

Code No: C4302, C4908, C0710,C4202, C5402, C6408 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD M.Tech I Semester Examinations, April/May-2012 ANALYSIS OF POWER ELECTRONIC CONVERTERS (COMMON TO POWER ELECTRONICS, ELECTRICAL POWER ENGINEERING, ELECTRICAL POWER SYSTEMS, POWER AND INDUSTRIAL DRIVES, POWER ELECTRONICS AND ELECTRIC DRIVES, POWER ENGINEERING AND ENERGY SYSTEMS)

Time: 3hours

Max. Marks: 60

Answer any five questions All questions carry equal marks

- 1. What is the principle of operation of cyclo converters? What is the effect of load inductance on the performance of cyclo converter?
- 2. The load of an ac voltage controller is resistive, with $R = 1.5 \Omega$. The input voltage is 120V (rms), 60 Hz. Plot the PF against the delay angle for single phase half wave and full wave controllers.
- 3. Explain the operation of a three phase, full converter with inductive load using necessary circuit diagram and wave forms.
- 4. Using neat circuit diagrams and necessary wave forms, explain the operation of Buck regulators. And also derive the necessary condition for continuous inductor current and capacitor voltage.
- 5.a) Explain the principle of operation of a single phase half bridge inverter with Resistive load.
- b) The single phase, half bridge inverter has a resistive load of $R = 2.4 \Omega$ and the input voltage $V_s = 48V$. Determine i) RMS output voltage. ii) Output power iii) Average and peak currents of each thyrister. iv) The THD v) Distortion Factor.
- 6.a) Explain the operation of twelve pulse converter.
- b) A three phase full converter is operated from a three phase, 230V, 60Hz supply. The load is highly inductive and the average load current is $I_a = 150A$ with negligible ripple. If the delay angle is $\alpha = 60^{\circ}$ Determine the ratings of thyristors.
- 7.a) Explain in detail the space vector Modulation.
 - b) What are the advantages of space vector Modulation?
- 8. Write a short notes on the following.
 - a) Sinusoidal PWM
 - b) Multi output boost converters
 - c) Delta Modulation.