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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

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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 = 1.5Ω. 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 = 2.4Ω 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 $\alpha = 60^0$ 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.

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