GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER-V • EXAMINATION – WINTER • 2014

Subject Code: X50903 Date: 04-12-2014 Subject Name: Power Electronics-II Time: 10:30 am - 01:00 pm **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. 0.1 (a) Explain difference between square wave inverter and PWM inverter. Draw 07 waveforms of line voltage, phase voltage and load current for 120° conduction mode of 3-phase bridge inverter with Y connected resistive load. Justify the sentence, "Space vector pulse width modulation (SVPWM) technique 07 **(b)** gives 1.1547 times output than sine PWM technique". Explain working principle of 3-phase current source inverter. 07 **Q.2** (a) Discuss series inverter in brief. **(b)** 07 OR Explain hysteresis band current control PWM technique. 07 **(b)** (a) Discuss 3-phase full wave controller with Δ connected load. 07 Q.3 Compare cycloconverter with DC link converter. 07 **(b)** OR A single phase full wave ac controller has a resistive load of R=15 Ω and the input 07 0.3 (a) voltage is 230 V (rms), 50 Hz. For 6 cycles on and 4 cycles off, determine (a) rms value of output voltage, (b) the input PF and (c) average and rms thyristor current. Explain transient performance of frequency controlled AC motors. 07 **(b)** (a) Explain self controlled synchronous motor drive using cycloconverter. 07 0.4 (b) Discuss slip power recovery control of induction motor drive. 07 OR **Q.4** (a) Explain single phase to three phase cycloconverter. 07 Explain load commutated synchronous motor drive. 07 **(b)** 07 With schematic diagram discuss role of inverter in active filters. Q.5 (a) (b) Discuss AC voltage controller with PWM control. 07 OR Q.5 (a) With schematic diagram explain induction heating application. 07 (b) Discuss harmonic analysis of 6-pulse converter. 07
