

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – SUMMER • 2014****Subject Code:170801****Date: 22-05-2014****Subject Name: Power Electronics and Industrial Drives****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Briefly state and discuss the various schematics of single phase ac to ac voltage controller. 7
- (b) Explain full wave controller with R-L load. Draw the necessary wave-form. 7
- Q.2** (a) Draw the schematic arrangement of full wave rectifier with R-L load and back emf E. Draw its waveform for load voltage V_L and Load Current I_L . Write down the formulae for rms diode current I_r , and average diode current I_d for discontinuous load current. 7
- (b) Briefly explain the voltage protection by selenium diode and metal oxide varistors 7
- OR
- (b) Briefly explain the gate driver circuits for thyristors.
- Q.3** (a) What is VSI ? Describe the operation of single phase half bridge VSI. Also state the switching state table for the same. 7
- (b) Briefly discuss the operation of on off controller with neat sketch of its waveform 7
- OR
- Q.3** (a) Explain the operation of 4 switch Single Phase Inverter with usual notations. 7
- (b) What is cyclo converter ? state the area of its application. Briefly discuss the operation of single phase cyclo converter along with its voltage and current waveform for resistive load. 7
- Q.4** (a) Explain the selective harmonic elimination technique for VSI. 7
- (b) Briefly discuss the 120 degree operation of inverter circuit with appropriate waveforms. 7
- OR
- Q.4** (a) Discuss the class B operation of Chopper Circuit. 7
- (b) Give comparison between current source inverter and voltage source inverter. 7
- Q.5** (a) Explain slip-power recovery by Static Scherbius method for speed control of induction motor. 7
- (b) Explain V/f control of induction motor drives Give its merits and demerits. 7
- OR
- Q.5** (a) Discuss the rotor voltage control for slip ring induction motor 7
- (b) Discuss about choice of AC and DC drive in detail 7
