

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – WINTER 2013****Subject Code: 160902****Date: 29-11-2013****Subject Name: Power Electronics-II****Time: 02:30 pm to 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) Draw the power circuit of a parallel inverter and discuss its operation. Also explain how voltage control can be obtained with this inverter. 07
- (b) List the commonly used PWM technique for voltage waveform and control of inverter. Explain any one in details. 07
- Q.2 (a) Describe using a neat circuit diagram, waveform and operation of PWM inverter and also explain how the output voltage can be controlled in this scheme. 07
- (b) Explain the operation of a single phase voltage controller supplying R-L load when the firing angle " α " is
(1) less than the load angle Φ (2) equal to load angle Φ (3) greater than load angle Φ . 07
- OR**
- (b) Write a brief note on 1 phase AC voltage controller with PWM control with necessary waveforms. 07
- Q.3 (a) A three phase bridge inverter has 180° conduction interval for its SCRs. Draw its power circuit and state the conduction sequences of the SCRs with necessary waveforms. 07
- (b) Draw the torque speed characteristics of 3 phase Induction motor and explain the following regions. (1).Plugging (2).Motoring (3).Generating. 07
- OR**
- Q.3 (a) Distinguish VSI and CSI and specify their applications. 07
- (b) Classify the various control strategies for speed control of 3 phase induction motor. Explain the operation of a constant V/F control for the Induction motor with neat schematic diagram. 07
- Q.4 (a) Describe the principle of working of a single phase to single phase bridge type step down cycloconverter feeding R-L load. 07
- (b) Describe in brief matrix converter. 07
- OR**
- Q.4 (a) Distinguish circulating current mode and non circulating current mode with cyclo converter. 07
- (b) State the various points of comparisons and their choice/criterion for selection between AC and DC drives. 07
- Q.5 (a) Explain the operation of a self controlled (closed loop) synchronous motor drive fed from a load commutated inverter to control the speed of synchronous motor with necessary schematic diagram. 07
- (b) Draw the neat circuit diagram and explain the speed control of 3 Φ Induction motor by static Scherbius system. 07
- OR**
- Q.5 (a) State the advantages of HVDC over conventional AC transmission system. Draw the schematic diagram of basic HVDC transmission system and explain in brief. 07
- (b) Draw the circuit for a static DC circuit breaker and discuss its advantages and disadvantages. 07
