

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VI • EXAMINATION – SUMMER • 2014**

**Subject Code: 160902****Date: 21-05-2014****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.

- 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) 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**
- Q.2** (a) Write a brief note on 1 phase AC voltage controller with PWM control with necessary waveforms. **07**
- (b) Describe with neat circuit diagram a single phase Mac-Murray Inverter employing auxiliary thyristor commutation method. **07**

**OR**

- (b) List various PWM methods used in inverters for Harmonic reduction and explain Sinusoidal Pulse Modulation with necessary waveforms. **07**
- Q.3** (a) Describe the principle of working of a single phase to single phase bridge type step down cycloconverter feeding R-L load. **07**
- (b) Draw the circuit diagram and explain the working of slip power recovery system using solid state scherbius system. **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) Explain the operation of single phase A C voltage controller using two anti parallel SCR's with R-L load for firing angle  $\alpha$  equal to and less than load phase angle  $\phi$ . derive relevant equation and draw the waveforms with neat circuit diagram. **07**
- (b) Describe in brief matrix converter. **07**

**OR**

- Q.4** (a) Explain the operation of a self controlled (closed loop) synchronous motor drive fed from a cycloconverter to control the speed of synchronous motor with necessary schematic diagram. **07**
- (b) State the various points of comparisons and their choice/criterion for selection between AC and DC drives. **07**
- Q.5** (a) Explain working of 3-phase cycloconverter with necessary waveforms. **07**
- (b) Draw the neat circuit diagram and explain the speed control of 3  $\phi$  Induction motor by rotor resistance control method using chopper. **07**

**OR**

- Q.5** (a) Describe principle and applications of facts device. **07**
- (b) Describe application of AC voltage controller as Transformer tap changer. **07**

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