GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER–V • EXAMINATION – WINTER 2013

Subject Code: X 50903   **Date: 09-12-2013**
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)** Explain the working of Mac- Murray Bedford inverter circuit with waveforms, Describe each interval of operation. **7**

(b) Draw and explain the series Inverter circuit employing Class-A type commutation. Draw and discuss the important waveforms. **7**

Q.2 **(a)** List various PWM methods used in inverters for Harmonic reduction and explain Sinusoidal Pulse Modulation with necessary waveforms. **7**

(b) Give the comparison between On/Off control and phase control of A.C voltage controller. **7**

OR

(b) Discuss the operation of single phase A.C voltage regulator with R-L load, when α is less than or equal to load phase angle Ø. Hence show that for α less than the output voltage of A.C voltage regulator cannot be regulated. **7**

Q.3 **(a)** State the various points of comparisons and their choice/criterion for selection between AC and DC drives. **7**

(b) Explain the principle of operation of three phase bridge inverter with 180 ° conduction mode with necessary circuit diagram and waveforms. **7**

OR

Q.3 **(a)** Draw the neat circuit diagram of three phase full wave bidirectional AC Voltage controller and explain it's working with waveforms for different firing angles. **7**

(b) Name the different methods of speed control of 3-Ø Induction motor. Explain the principle of speed control of it by PWM method **7**

Q.4 **(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. **7**

(b) Describe the basic principle of single phase to single phase cycloconverter for both Continues and discontinues conduction for bridge type cycloconverter. **7**

OR

Q.4 **(a)** Draw the circuit diagram and explain the working of slip power recovery system using solid state scherbius system. **7**

(b) Draw the torque speed characteristics of 3 phase Induction motor and explain the following regions. (1).Plugging (2).Motoring **7**

Q.5 **(a)** Differentiate voltage source inverter with current source inverter. **7**
(b) Draw the neat circuit diagram and explain the sped control of 3 Ø Induction motor by rotor resistance control method using chopper. **7**

OR

Q.5 **(a)** Draw and explain the operation of DC static circuit breaker and list it's applications. **7**
(b) Explain the stator voltage control of induction motor drives. **7**

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