

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC SEM-V Examination-Nov-2011

Subject code: X50903

Date: 24/11/2011

Subject Name: Power Electronics-II

Time: 2.30 pm -5.00 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) Sketch the circuit diagram of Parallel Inverter. Explain how class-B commutation is used and sketch necessary waveforms. Discuss the, Working of the circuit and its advantages. **07**
- (b) Explain the working of Mac Murray Bedford inverter circuit with waveforms, Describe each interval of operation. **07**

- Q.2** (a) List various PWM methods used in inverters for Harmonic reduction and explain Sinusoidal Pulse Modulation with necessary waveforms. **07**
- (b) Explain 3 phase full wave bridge Inverter with 120° operation & necessary wave forms. **07**

OR

- (b) Draw and explain the simple series inverter circuit employing class-A commutation. Draw and discuss the important waveforms. **07**

- Q.3** (a) Describe the basic principle of single phase to single phase Cycloconverter for both Continuous and discontinues conduction for bridge type Cycloconverter. **07**
- (b) Discuss the operation of delta connected 3 phase A C voltage controller with suitable power diagram also draw the various waveforms at $\alpha=120^\circ$. **07**

OR

- Q.3** (a) 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 ϕ . Hence show that for α less than the output voltage of A.C voltage regulator cannot be regulated. **07**
- (b) Explain variable voltage fixed frequency control or Stator voltage control of induction motor. **07**

- Q.4** (a) State various schemes for speed control of 3 phase Induction motor. **07**
- (b) Explain chopper based rotor side speed control of 3 phase induction motor. **07**

OR

- Q.4** (a) Explain slip power recovery based speed control method for 3 phase Induction motor. **07**
- (b) Advantage and disadvantage of A.C. drives over D.C. drives. **07**

- Q.5** (a) Describe Vector controlled drive for speed control of Induction motor. **07**
- (b) Describe CSI based speed control of Induction motor **07**

OR

- Q.5** (a) Give a comparison of Voltage Source Inverter and Current Source Inverter. **07**
- (b) Write short notes on application of SCR converters: **07**
- (i) HVDC transmission
- (ii) Battery charger
