

**B.Tech. IN ELECTRONICS AND
COMMUNICATION ENGINEERING (BTECVI)****Term-End Examination****December, 2012****BIEL-019 : POWER ELECTRONICS***Time : 3 hours**Maximum Marks : 70*

*Note : (i) Attempt any seven questions.
(ii) All questions carry equal marks.*

1. (a) What are the different methods to turn on the thyristor ? 3
- (b) Define Latching current. 2
- (c) What is meant by step - up and step - down chopper ? 3
- (d) Give an expression for average voltage of single phase semi converters. 2

2. (a) What are the characteristics of an ideal Power switching device ? Compare the characteristics of IGBT and MOSFET. 6
- (b) What are the different methods of firing employed for SCR triggering ? 4

3. Discuss of working of single - phase full wave ac -dc converter taking into account the effect of source inductance. Draw the output voltage waveform for firing angle 30 degrees. **10**

4. (a) An SCR has an anode supply of sine voltage 200 V rms, 50 Hz applied through a 100 Ω resistor and fired at an angle of 60°. Assuming no voltage drop. Find the rms value of the output voltage. **5**
- (b) With neat diagram, explain the working of bridge circuit with Line Commutation (continuous) **5**

5. Explain the operation of voltage commutated chopper with neat diagram and waveforms. Derive expressions for commutating capacitor and commutating inductor. **10**

6. Explain the operation of single phase modified MC Murray half bridge inverter. **10**

7. A 220 volts, 25 A, 1000 rpm separately excited DC motor has armature resistance 1.5 Ω and is controlled by a chopper of 600 Hz and source voltage 230 volts. Calculate duty ratio. **10**

8. Discuss briefly the characteristics and the principle of operation of Induction Motor. **10**

9. Describe in detail "The closed loop control of DC drives" and DC chopper drives. **10**
10. Write short notes on any *two* of the following : **2x5=10**
- (a) Schemes for DC motor speed control
 - (b) Synchronous Drives
 - (c) Three phase Dual converters.
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