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BIEL-019

00286

B.Tech. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

June, 2013

BIEL-019 : POWER ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

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

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1. (a) Define holding current. 2

(b) How can a thyristor turned off ? 2

(c) How is inverter circuit classified based on commutation circuitry ? 3

(d) What are the applications of Series inverter ? 3

2. (a) Draw the static V - I characteristics of SCR and explain its modes of operation. 5

(b) Define di/dt and dv/dt ratings of SCR. How is SCR protected against these ? 5

3. A three phase full converter is fed by 400 volts, three phase, 50 Hz supply. The average load current is 150 A and load is highly inductive. For a firing angle of 60 degrees, find output power, average, rms and peak current through thyristors and peak inverse voltage. 10

4. What are dual convertors ? Explain operation of a three phase dual converter using circulating current mode of operation. How are firing angles of two converters controlled ? **10**

5. Describe the principle of step - up chopper. Derive an expression for the average output voltage in terms of input dc voltages and duty cycle. **10**

6. Describe the operation of series inverter with aid of diagrams. Describe an expression for output frequency, current and voltages. What are the advantages of basic series inverter ? **10**

7. Explain briefly the characteristics and principle of operation of Induction motor. **10**

8. Describe in detail "Single - Phase seperately Excited drives" and "Single - Phase Series Motor Drives". **10**

9. Explain the operation of 3 phase bridge inverter for 120° degree mode of operation with aid of relevant phase and line voltage waveforms. **10**

10. Write short notes on ***any two*** of the following : **2x5=10**
    (a) Variable frequency control
    (b) Single phase PWM Inverters
    (c) DC chopper Drives