

**B.Tech. – VIEP – ELECTRONICS AND
COMMUNICATION ENGINEERING (BTECVI)****Term-End Examination**

00534

June, 2017

BIEL-019 : POWER ELECTRONICS*Time : 3 hours**Maximum Marks : 70*

Note : Attempt any **seven** questions. Draw neat waveforms and circuit diagrams. Use of scientific calculator is allowed. Missing data, if any, may be suitably assumed.

1. Explain the following ratings of SCR : 10
 - (a) Average ON state current
 - (b) Surge current rating
 - (c) RMS ON state current
 - (d) I^2t rating
 - (e) $\frac{di}{dt}$ rating
2. Explain the construction and working of power MOSFET. Also draw its characteristics. 10
3. Draw and explain the working of a single-phase half wave circuit with different loads. 10

4. (a) Give the comparison between non-circulating current mode and circulating current mode in a dual converter. 5
- (b) Draw and explain in detail the firing scheme for a dual converter. 5
5. For a chopper circuit shown in Figure 1, express the following variables as a function of E_{dc} , R and duty cycle α : 10
- (a) Average output voltage and current
- (b) Output current at the instant of commutation
- (c) Average and RMS freewheeling diode currents
- (d) RMS value of the output voltage
- (e) RMS and average load currents

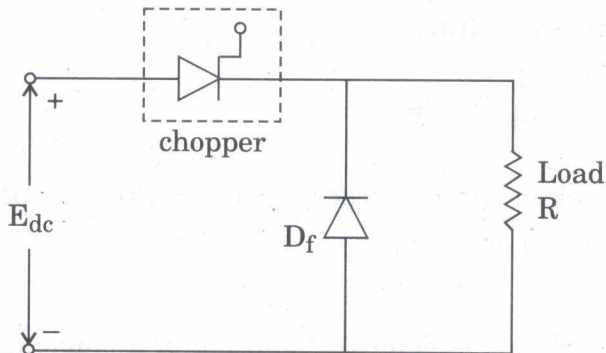


Figure 1

6. With the help of neat circuit diagram and waveforms, explain briefly the operation of a thyristorised 3- ϕ bridge inverter in the presence of resistive load with
- (a) 180° conduction mode, and
 - (b) 120° conduction mode. 10
7. Explain the basic principle of operation of a cycloconverter with a neat circuit diagram. 10
8. Draw and explain four-quadrant d.c. chopper. 10
9. What are the different methods of speed control for induction ? Explain any one of them. 10
10. Write short notes on any **two** of the following : $2 \times 5 = 10$
- (a) Single-Phase PWM Inverter
 - (b) TRIAC
 - (c) D.C. Motor Speed Control
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