No. of Printed Pages : 2

BIEL-019

B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

00119 **December, 2014**

BIEL-019 : POWER ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions in all. All questions carry equal marks. Missing data if any may be suitably assumed. Use of scientific calculator is permitted.*

1. (a) Explain the different methods of turning on of an SCR. 7

(b) Explain the principle of operation of the IGBT and its advantages over the power transistor. 7

2. (a) Discuss the working of a single-phase series inverter. What are the limitations of a series inverter ? 7

(b) Explain how regenerative braking can be achieved by means of a dual converter bridge. 7

3. (a) What are the techniques used to control the operation of a chopper circuit ? 7

(b) A 60 V battery supplies an inductive load through a chopper circuit. The load inductance and resistance are 30 mH and 5 Ω respectively. The load has a freewheeling diode across it. What should be the time ratio and duty cycle of the chopper, if average output voltage of the chopper is 45 V ? *7*

4. (a) With the help of a circuit and waveforms diagrams, describe the working principle of three-phase full controlled rectifier. *7*

(b) Explain the working of modified McMurray half bridge inverter with the help of a neat diagram. *7*

5. Explain how the speed of a dc series motor can be controlled by using thyristors (SCRs). What are the parameters to be varied for speed control of a separately excited dc motor ? *14*

6. (a) Define the following : *8*

(i) Latching current

(ii) Holding current

(iii) Commutation

(iv) Firing

(b) Explain the speed control of induction motor by Stator Voltage Control method. *6*

7. Write short notes on any ***two*** of the following : *2×7=14*

(a) GTO

(b) Current Source Inverter

(c) Slip Power Recovery Scheme
