

**B.Tech. - VIEP - ELECTRONICS AND
COMMUNICATION ENGINEERING (BTECVI)**

Term-End Examination

June, 2015

00666

BIEL-019 : POWER ELECTRONICS

Time : 3 hours

Maximum Marks : 70

Note : Attempt any five questions. Missing data, if any, may be suitably assumed. Use of scientific calculator is permitted.

1. (a) Draw the volt - ampere characteristic of SCR and explain its working. 7
- (b) Explain how a transistor can be used as a switching element. Also compare transistor and SCR as switching elements. 7
2. (a) Draw the circuit diagram of a circulating type dual converter using mid-point configuration. 7
- (b) Discuss the working of a three-phase semi-converter with the help of a neat diagram. 7
3. (a) Explain the operation of a step-up chopper and derive an expression for its output voltage. 7

- (b) A chopper circuit is operating at a frequency of 2 kHz on a 460 V dc supply. If the load voltage is 350 V, calculate the conduction and blocking period of the SCR in each cycle. 7
4. (a) Discuss the working of a single-phase series inverter. Also give its limitations. 7
(b) Explain the working of a PWM inverter with the help of a neat diagram. 7
5. (a) Explain how the speed of a slip ring induction motor can be controlled by using the ON-OFF control method. 7
(b) Explain why the dual converter method is superior to the rest of the methods for the purpose of regenerative braking. 7
6. (a) Explain how the speed of induction motor can be controlled. 7
(b) Compare the features of Power MOSFET and Power Transistor. Also draw their symbols and characteristics. 7
7. Write short notes on any *two* of the following: 2×7=14
(a) IGBT
(b) Slip power recovery scheme of induction motor
(c) Current commutated chopper
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