

**B.Tech. SEM -IV Electrical 2014 Course (CBCS) : SUMMER - 2019**

**SUBJECT- POWER ELECTRONICS**

Day: Thursday  
Date: 23/05/2019

**S-2019-2607**

Time: 10.00 AM TO 01.00 PM  
Max. Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat diagram **WHEREVER** necessary.

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**Q.1** a) Describe the holding current & latching current as applicable to an SCR with the help of static V-I characteristics. (05)

b) Draw the gate characteristics of an SCR and explain it. (05)

**OR**

**Q.1** a) Explain in detail the turn off mechanism of an SCR. (05)

b) Explain the various types triggering methods & SCR. (05)

**Q.2** a) Drive an expressions for the (05)

i) Average load voltage

ii) Average load current

For single phase full controlled converter with R load

b) Explain the effect of freewheeling diode with neat sketch for R-L Load (05)

**OR**

**Q.2** a) Derive an expression for average load voltage and Average load current (05)

For M-2 Configuration with R-load

b) Describe the working of 6 pulse midpoint converter with inter-phase reactor (05)

**Q.3** a) Explain with a neat sketch how DIAC is used as a triggering agent for a TRIAC. (05)

b) List the advantages & disadvantage of single phase half wave AC regulator. (05)

**OR**

**Q.3** a) Draw & Explain the V-I Characteristics of TRIAC (05)

b) Distinguish between 2 stage & multi stage sequence control of AC voltage regulator. (05)

**P.T.O.**

- Q.4 a)** Draw & Explain the operation of cross sectional structure of power MOS FET. (05)  
**b)** Draw & Explain the V-I characteristics of IGBT (05)

**OR**

- Q.4 a)** With the help of block diagram explain the operation of solid state UPS (05)  
system.  
**b)** List the merits & demerits of online UPS & offline UPS. (05)

- Q.5 a)** Draw the Schematic of step down & step Up choppers & Explain. (05)  
**b)** Explain the time ratio control (TRC) & current limit control (CLC) & control (05)  
strategies used for chopper.

**OR**

- Q.5 a)** With the help of circuit diagram explain the working of class A chopper. (05)  
**b)** Draw the single SCR chopper circuit for the control of DC series motor. (05)

- Q.6 a)** Explain the principle of operation of an inverter also give classification. (05)  
**b)** List the different voltage control & PWM techniques used in inverter. (05)

**OR**

- Q.6 a)** Give reason why a PWM inverter is superior to Square Wave inverter. (05)  
**b)** Explain the operation of feedback diodes used in anti-parallel with transistor (05)  
in inverter.

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