

ELEX 6 SEM POWER ELECTRONICS-1 JUN 2016

QP Code :591902

(3 Hours)

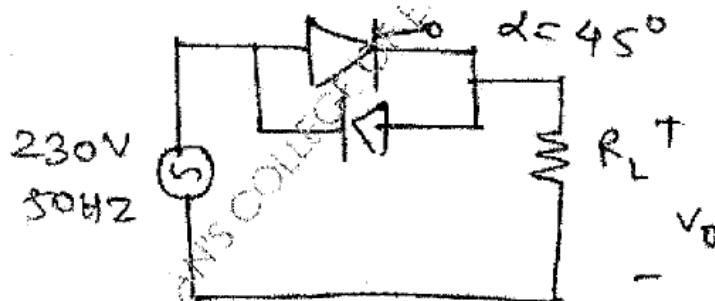
[ Total Marks :80

N.B. : (1) Question No. 1 is compulsory.

(2) Attempt any three questions out of remaining five questions.

(3) Figures to the right indicate full marks.

1. (a) Draw and explain dynamic turn on characteristics of SCR 5  
 (b) What is the need of commutation. Explain the any one method of forced communication. 5  
 (c) Define and explain performance parameters of controlled rectifier 5  
 (d) Draw and explain boost converter. Derive the relation for output load voltage. 5
2. (a) Draw and explain semi-converter with the help of circuit diagram and waveforms. 10  
 (b) Draw and explain Buck-Boost converter with the help of circuit diagram and waveforms Derive the relation for load voltage. 10
3. (a) Explain the working of three phase bridge inverter in  $120^\circ$  conduction mode with resistive load. Draw waveforms. 5  
 (b) Draw the load voltage waveform for the circuit given below. 5



- (c) draw and explain SOA of power MOSFET. 5
4. (a) A single phase semi converter is operated from 230V, 50Hz ac supply. The load resistance is  $20\Omega$ . The average output voltage is 30% of the max. Possible average output voltage. Determine
  - (i) Firing angle
  - (ii) RMS and Average output current
  - (iii) RMS and average thyristor current
- (b) Explain in brief single phase cyclo-converter with circuit diagram and waveforms. 5

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- (c) Explain the need of neutrilisation of harmonics of inverters. 5
5. (a) Explain the working of AC full wave control circuit using DIAC-TRIAC. 10  
Draw waveforms across load and TRFAC for  $\alpha = 60^\circ$ . Derive relation for RMS load voltage.
- (b) Explain the multiple pulse width modulation in inverters. Explain the neutrilisation of harmonics. 10
6. (a) Single phase full bridge inverter has a resisistive load of  $R = 3\Omega$  and the dc input voltage  $E_{dc} = 50V$ . compute 10  
(i) The average output power  $P_o$   
(ii) The average and peak current of each thyristor.
- (b) Draw and explain switching cha. of GTO 5
- (c) Draw and explain snubber circuit. 5