Exam Seat No:	
C.U. SHAH UNIVERSITY	
Summer Examination-2020	
	C.U. SHAH UNIVERSITY

Subject Name: Power Electronics-I

Subject Code: 4TE05PEL1 Branch: B.Tech (Electrical)

Semester: 5 Date: 26/02/2020 Time: 10:30 To 01:30 Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Draw symbol of diac.

7)

Q-1	Attempt the following questions:	(14)
1)	Which terminal does not belong to the SCR? (a) Anode (b) Gate (c) Base (d) Cathode	(01)
2)	An SCR is a (a) four layer, four junction device (b) four layer, three junction device (c) four layer, two junction device (d) three layer, single junction device	(01)
3)	A thyristor (SCR) is a (a) P-N-P device (b) N-P-N device (c) P-N-P-N device (d) P-N device	(01)
4)	Which device can be used in a chopper circuit? (a) BJT (b) MOSFET (c) GTO (d) All of above	(01)
5)	based inverters do not require self-commutation. (a) IGBT (b) MOSFET (c) GTO (d) SCR	(01)
6)	Define holding current.	(01)

(01)



	8)	IGBT is a controlled device.	(01)
	9)	Give definition of latching current.	(01)
	10)	Write function of inverter.	(01)
	11)	What is the function of free-wheeling diode?	(01)
	12)	Give function of chopper.	(01)
	13)	Enlist the different types of cyclo-converter.	(01)
	14)	Write full form of GTO.	(01)
Attem Q-2	pt any fo	our questions from Q-2 to Q-8 Attempt all questions	(14)
	(a)	Draw Structure and symbol of SCR and explain principle of SCR.	(07)
	(b)	Give various turn on methods of SCR. Explain any three methods.	(07)
Q-3		Attempt all questions	(14)
	(a)	Give the comparison between power MOSFET and power BJT.	(07)
	(b)	Draw the structure and explain the operation of TRIAC in any two modes.	(07)
Q-4		Attempt all questions	(14)
	(a)	Draw basic UJT structure, symbol and equivalent circuit and explain its circuit operation.	(07)
	(b)	Write short note on MOSFET.	(07)
Q-5		Attempt all questions	(14)
	(a)	Explain principle of step-down chopper with necessary waveforms.	(07)
	(b)	Write short note on IGBT.	(07)
Q-6		Attempt all questions	(14)
	(a)	Give the classification of chopper. Draw and explain basic dc chopper configuration.	(07)
	(b)	List triggering circuit and explain any one in detail.	(07)
Q-7		Attempt all questions	(14)
	(a)	Draw and explain single phase full bridge inverters.	(07)



(b) Draw the circuit diagram and waveforms of three phase inverter with 120° (07) conduction mode with resistive load and explain its operation.
 Q-8 Attempt all questions (14)

(a) List voltage control technique for inverter and explain any two in detail. (07)

(b) Draw the circuit diagram of single phase to single phase cyclo-converter with resistive load and explain its operation with necessary waveforms. (07)