Enrollment No:	Exam Seat No:

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name: Power Electronics

Subject Code: 4TE06PEL1 Branch: B.Tech (IC)

Semester: 6 Date: 21/04/2017 Time: 2:30 To 5:30 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.

Q-1 Attempt the following questions:

(14)

- 1) Define: Holding current
- 2) Draw the symbol of DIAC and SCR.
- 3) In a SCR, holding current is less than latching current, Determine whether the given statement is true or false.
- 4) Give any two differences between signal diode and power diode.
- 5) What is the important of snubber circuit in power electronics?
- **6**) Which one of this power electronics converter is used to convert fixed DC voltage into variableDC voltage?
- 7) Draw only the circuit diagram of *class B* chopper.
- 8) Give the types of commutation techniques.
- 9) How many thyristors are used in full wave bridge controlled rectifier?
- **10**) If the firing angle of the SCR increases, the output voltage of the rectifier decreases. Determine whether the given statement is true or false.
- 11) What is the purpose of using freewheeling diode in a rectifier circuit?
- **12**) Write the operating principle of cyclo-converter.
- 13) Give any four industrial applications of power electronics.
- **14)** Draw only the circuit diagram of series inverter.

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions

(14)

	(a)	Draw the basic structure of power diode and explain its operation with the help of	07
		its V-I characteristics.	
	(b)	Explain the two transistor analogy of SCR.	07
Q-3		Attempt all questions	(14)
	(a)	Draw the structure of TRIAC and explain its operation in any two modes.	07
	(b)	Explain how snubber circuit in useful in over voltage protection for thyristor.	07
Q-4		Attempt all questions.	(14)
	(a)	Draw the circuit diagram and waveforms of single phase half wave controlled	07
		rectifier with resistive load and explain its operation.	
	(b)	Draw the circuit diagram and waveforms of single phase full wave bridge	07
		controlled rectifier with R-L load and explain its operation.	
Q-5		Attempt all questions	(14)
	(a)	Draw the circuit diagram and waveforms of single phase half bridge inverter with	07
		resistive load and explain its operation.	
	(b)	Draw the block diagram of online UPS and explain its operation.	07
Q-6		Attempt all questions	(14)
	(a)	Draw the circuit diagram of class A chopper and explain its operation.	07
	(b)	A 230 V (rms), 50 Hz single phase half wave controlled rectifier is feeding a	07
		resistive load of 100 Ω . If the firing angle of SCR is $\alpha = 45^{\circ}$, Determine	
		i) Average load voltage ii) RMS load voltage iii) PIV across SCR.	
Q-7		Attempt all questions.	(14)
	(a)	Draw the circuit diagram and waveforms of three phase to single phase cyclo-	07
		converter for resistive load and explain its operation.	
	(b)	Draw the circuit diagram and waveforms of single phase to single phase cyclo-	07
		converter for resistive load and explain its operation.	
Q-8		Attempt all questions	(14)
	(a)	Draw the circuit diagram and waveforms of Jones chopper and explain its	07
		operation.	
	(b)	Explain temperature controller using power electronics.	07

