Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – SUMMER 2019

Subject Code: 2132404 **Date: 15/06/2019**

Subject Name: Principles of Power Electronics

Time: 02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Explain the need of electrical power processing.	**03**
	(b)	Compare Linear Electronics and Power Electronics and state the main difference between a semiconductor and power semiconductor switch.	**04**
	(c)	Explain the characteristics of ideal switch. List and explain losses in a practical switch.	**07**
Q.2	**(a)**	Draw the V-I characteristics of a diode.	**03**
	(b)	State the applications of following diodes (At least 2): 1) LED 2) Photo Diode 3) Zener Diode 4) Schottky Diode	**04**
	(c)	Draw and explain the construction of a power diode. How is it different from signal diode?	**07**
		OR	
	(c)	Draw and explain input and output characteristics of BJT in CE configuartion.	**07**
Q.3	**(a)**	What are h-parameters? What is their significance?	**03**
	(b)	Explain transistor as a switch.	**04**
	(c)	Explain CB configuration of transistor.	**07**
		OR	
Q.3	**(a)**	Explain the “Field Effect” in MOSFET. What is its main advantage?	**03**
	(b)	Explain Class-C commutation circuit for thyristor.	**04**
	(c)	Draw and explain the V-I characteristics of power MOSFET.	**07**
Q.4	**(a)**	Draw symbols of: TRIAC, SCR, MOSFET, GTO, BJT, UJT.	**03**
	(b)	Explain DIAC based firing scheme for TRIAC. State one application.	**04**
	(c)	Compare MOSFET, BJT, SCR, Diode.	**07**
		OR	
Q.4	**(a)**	List only, various types of thyristors (any six) with their full names.	**03**
	(b)	Draw and explain UJT firing scheme for SCR.	**04**
	(c)	Explain two transistor model of SCR.	**07**
Q.5	**(a)**	Draw a neat diagram showing the V-I characteristics of SCR.	**03**
	(b)	What are the different ways to turn-on SCR? Explain each in brief.	**04**
	(c)	Draw and explain the construction of power MOSFET.	**07**
		OR	
Q.5	**(a)**	Explain Power Darlington circuit.	**03**
	(b)	Draw the construction of power BJT. How it is different from BJT?	**04**
	(c)	Explain paralleling of power MOSFETs. List and explain in brief, the main issues arising in this process.	**07**

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