



Registration No:

--	--	--	--	--	--	--	--	--	--

M.TECH

Total Number of Pages : 1

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2018
POWER SEMICONDUCTOR DEVICES & MODELING

Branch: PE, Subject Code: MPEPE1043

(Regulations 2018)

Time: 3 Hours

Max Marks : 70

Question Code:RD18002074

PART-A (10 X 2=20 Marks)

1. Answer the following questions.
 - a. What are converter grade and inverter grade thyristors.
 - b. Brief the phenomenon of secondary breakdown in BJTs.
 - c. Differentiate between GTO & TRIAC.
 - d. What are the parameters that affect the life time and performance of power semiconductor devices.
 - e. Differentiate between NPN and PNP transistors.
 - f. What is the need of isolation for power semiconductor devices.
 - g. Define the concept of latching.
 - h. Define SOA.
 - i. What are the available ratings of various power semiconductor devices.
 - j. List out the advantages of oil cooling.

PART-B (5 X 10=50 Marks)

Answer any five questions from the following.

2. a. What are the advantages and disadvantages of power semiconductor devices? [5]
b. Briefly explain the power handling capability of various devices. [5]
3. a. With the help of neat sketch, explain the electrical equivalent circuit of thermal model of a power device. [5]
b. Explain the necessity of using isolation, pulse transformer as protection circuits [5]
4. a. Explain the switching characteristics of thyristors during turn-on and turn-off [5]
b. Draw and explain the static and switching characteristics of power MOSFET. [5]
5. a. Draw and explain the static and switching characteristics of Thyristor [5]
b. Compare FCT, RCT and IGCT [5]
6. a. Explain the Forward, Reverse and switching characteristics of power diode [5]
b. Explain the Power handling capability and Safe operating Area of Power device [5]
7. a. Explain the basic structure and operating characteristics of an MCT. [5]
b. Explain the basic structure and operating of an IGBT [5]
8. a. Draw and explain the gate Driver circuit of SCR, BJT. [5]
b. Explain the design of Different types of Heat sinks. [5]