APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER

Name : ....

Reg.No: ....

FIRST SEMESTER M.TECH. DEGREE EXAMINATION DECEMBER 2017

Branch: Electrical Engineering   **Specialization: Power Electronics**

08EE6251(A) Power Semiconductor Devices and Modeling

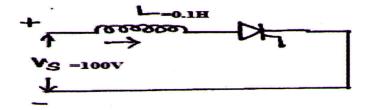Time:3 hrs   Max. marks: 60

Answer all six questions. Part 'a' of each question is compulsory.

Answer either part 'b' or part 'c' of each question

Q.no.	Module 1	Marks
1.a	What are the three elements of EMC?	3
	Answer b or c	
b	What are the Strategies of Device Selection in Power Electronics?	6
c	Explain Power Electronic converters and its applications?	6

Q.no.	Module 2	Marks
2.a	What makes the power diodes suitable for High Power Applications	3
	Answer b or c	
b	Prove that reverse recovery time t_{rr} and Peak Inverse current I_{RM} are dependent on storage charge and rate of change of current?	6
c	Discuss different types of Power Diodes and its applications	6

Q.no.	Module 3	Marks
3.a	The latching current in the circuit shown in fig is 4mA obtain the minimum width of the gating pulse required to properly turn-on the SCR?	3

Answer b or c

b	Explain the series parallel operation of SCR?	**6**
c	With neat diagram explain the gate and switching characteristics of SCR?	**6**

Q.no.	Module 4	Marks
4.a	What is the principal difference between IGBT and MOSFET?	3

Answer b or c

b	Explain the working of a)GTO b)MCT c)IGCT	**6**
c	Explain the Switching Characteristic of IGBT?	**6**

Q.no.	Module 5	Marks
5.a	Why isolation is required in the firing circuit	4

Answer b or c

b	a)Explain the working of pulse transformer and optocoupler. b)Explain the base drive circuit for MOS-FET and IGBT	**8**
c	Explain the need of snubber circuits and basic snubber circuits	**8**

Q.no.	Module 6	Marks
6.a	Explain the need of heat sink? What are the different methods of heat transfer	4

Answer b or c

b	Explain the process of selection of heat sink and different types	**8**
c	Explain the heat transfer in a power switch? Obtain the electrical analogy of thermal components.	**8**