Reg. No……..

Name……

M. TECH. DEGREE EXAMINATION

First Semester

Model Question Paper

Branch: Electrical and Electronics Engineering

Specialization: Industrial Drives and Control

MEEID 106.3 ADVANCED POWER SEMICONDUCTOR DEVICES

(2013 Admission onwards)

[Regular/Supplementary]

Time: Three Hours Maximum: 100 Marks

1. (a) Explain Switching characteristics of power diode. (15 marks)
   (b) Explain different types of power diodes. (10 marks)

OR

2. (a) Differentiate static and dynamic behavior of an Ideal switch and explain how a practical switch is deviated away from an ideal switch behavior. (15 marks)
   (b) Explain briefly about schottky diode. (10 marks)

3. (a) What is quasi saturation in power BJT and also write notes on emitter current crowding. (13 marks)

(b) Explain the turn on process of a SCR in terms of device physics. What are converter grade and inverter grade SCR's? (12 marks)

OR

4. (a) Explain about device physics and secondary breakdown of Power BJT. (12 marks)
   (b) What is power darligton. (8 marks)
   (c) Compare thyristor and BJT. (5marks)

5. (a) Give detail of construction and explain device physics of IGBT. (18 marks)
   (b) Briefly explain switching characteristics of IGBT. (7 marks)

OR

6. (a) Give details of construction and explain device physics of MOSFET. (18 marks)
   (b) Briefly explain static characteristics of MOSFET (7 marks)

7. (a) What is the need of isolation of power electronic circuits? List the advantages and disadvantages of isolation using (a) optocoupler and (b) pulse transformer. (10 marks)

   (b) A PIC microcontroller gives a square wave drive signal with amplitude of 5 volts at 10 kHz. It is to be applied to an IGBT switch. Draw and explain different type of driver circuits for an IGBT. (15 marks)

OR

8. (a) With necessary circuit diagram and waveforms, discuss a turn-on and turn-off snubber circuit for a power transistor. (20 marks)
   (b) Briefly explain about the types heat sink. (5 marks)