

D 32792

Name.....
Reg. No.....



FIRST SEMESTER M.TECH. DEGREE EXAMINATION, JANUARY 2013

EPD/EPE 10 105A—POWER SEMICONDUCTOR DEVICES AND MODELLING

Time : Three Hours

Maximum : 100 Marks

Answer any five questions, choosing at least one question from each module.

Module 1

1. (a) Write short notes on EMI due to switching of power switching devices. (8 marks)
- (b) Draw and explain the construction and characteristics of Schottky diodes. (12 marks)
2. (a) Write detailed notes on the switching characteristics of Power diodes. (10 marks)
- (b) Explain the power handling capability and SOA of power switching devices. (10 marks)

Module 2

3. (a) Draw the dynamic model of BJT and explain. (8 marks)
- (b) With neat circuit diagrams, explain the static and switching characteristics of BJT. (12 marks)
4. (a) Explain the series and parallel operation of thyristors with neat applications. (10 marks)
- (b) Compare the characteristics of BJT with thyristor. (10 marks)

Module 3

5. (a) Draw the steady state model of power MOSFET and explain. (8 marks)
- (b) Explain the static and switching characteristics of IGBT. (12 marks)
6. Explain the following :-
 - (a) GTO. (5 marks)
 - (b) IGCT. (5 marks)
 - (c) MCT. (5 marks)
 - (d) FCT. (5 marks)

Module 4

7. (a) Explain the necessity of isolation of power device with an example circuit. (8 marks)
- (b) Explain the protection of MOSFET against over voltage and over current. (12 marks)
8. (a) Write short notes on modes of heat transfer in thermal protection. (8 marks)
- (b) Explain the types of heat sinks and their design in the thermal protection of SCR. (12 marks)