

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)

CLASS: M.TECH/MSC  
BRANCH: ECE/PHYSICS

SEMESTER : II  
SESSION : SP/19

SUBJECT: EE589 POWER SEMICONDUCTOR DEVICES

TIME: 3.00 HOURS

FULL MARKS: 50

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) List two unidirectional and controllable power devices. Draw their appropriate symbols. [5]  
Q.1(b) Draw dynamic switching characteristics of a power diode. Show reverse recovery time and stored reverse recovery charges. [5]
- Q.2(a) Explain two different methods of switching on a Thyristor. [5]  
Q.2(b) Describe Class A and Class B method of computation. [5]
- Q.3(a) Differentiate between Power MOSFET and IGBT. [5]  
Q.3(b) Obtain mathematical expression for Turn ON Delay Time, Rise Time of Drain Current in a POWER MOSFET. [5]
- Q.4(a) Differentiate between Punch through IGBT and Non-Punch through IGBT. [5]  
Q.4(b) What are different applications of IGBT? [5]
- Q.5(a) Describe a circuit for providing protection to Thyristor against  $dv/dt$  and  $di/dt$ . [5]  
Q.5(b) What properties a Driver Circuit must have for safe operation of a Power Semiconductor Device? [5]

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