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Total Number of Pages : 01

M.TECH

AR-19

M.TECH 1ST SEMESTER EXAMINATIONS NOV/DEC 2019

PE, MPEPE1043

POWER SEMICONDUCTOR DEVICES AND MODELLING

Time: 3 Hours

Max Marks : 70

The figures in the right hand margin indicate marks.

PART-A

(10 X 2=20 MARKS)

1. Answer the following questions.

- What do you mean by multi emitter transistor?
- Give some applications of BJT.
- How turning on of SCR is done?
- List the application of SCR.
- What is a Snubber circuit? What is its need?
- Define “Safe operating Area”.
- What is the major drawback of the first generation IGBT?
- In a BJT, the emitter current is 12 mA and the emitter current is 1.02 times the collector current. Find the base current.
- Why are power transistor provided with heat sinks?
- Define the different operating regions of transistor.

PART-B

(5 X 10=50 MARKS)

Answer any five questions from the following.

2.

- Discuss the turn –on process of a BJT with a Suitable example
- Draw the Eber-Moll’s transistor model and write short notes on the elements used in the model.

3.

- Explain the turn – on and off process of a thyristor.
- Describe the structure of a thyristor with a neat diagram

4.

- Discuss the design procedure of the following magnetic components
 - Line frequency inductors
 - High frequency inductor.
- Write short notes on the necessity of heat sinks and its sizing considerations.

5.

- Discuss about isolated and non-isolated gate drive circuits for IGBT’s.
- Explain the uniqueness of a thyristor using its VI characteristics

6.

- Explain the construction & switching characteristics of GTO.
- Draw and Disuse output characteristics of BJT.

7.

- Explain the switching characteristics of IGBTs.
- Explain the switching characteristics of GTO.

8.

- Describe the following : (i) Forward biased safe operating area . (ii) Reverse biased safe operating area.
- Discuss the methods used for improving the di/dt rating of a thyristor.