

Hall Ticket Number :

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R-19

Code: 19A252T

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2023

Power Electronics

(Electrical and Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

UNIT-I

1. Compare the Resistance (R) and Resistance-Capacitance (RC) triggering circuits of SCR 14M

OR

2. a) Explain about the Dynamic turn on Characteristics of SCR with wave forms 7M
b) Describe the UJT triggering circuit with neat sketch. 7M

UNIT-II

3. Justify why protection circuits are required in SCR? Explain in detail about the di/dt and dv/dt protection with neat sketch. 14M

OR

4. a) Explain in detail gate protection of SCR with neat sketch 7M
b) Analyze the cooling mechanism and mounting of thyristors. 7M

UNIT-III

5. Analyze the effect of source inductance in the operation of single phase fully controlled converter with relevant diagram. 14M

OR

6. a) Explain the operation of single phase full wave controlled rectifier with 'R' load with neat circuit diagram and necessary waveforms 7M
b) Summarize the role of freewheeling diode in converters. 7M

UNIT-IV

7. A chopper circuit is operating on TRC principle at frequency of 4 KHZ and 220V DC supply. If the load voltage is 175V .Compute the Conduction and blocking periods of thyristor in each cycle. 14M

OR

8. a) Explain the operation of step up chopper and derive an expression for its output voltage 7M
b) Describe the various types of chopper configurations briefly. 7M

UNIT-V

9. Design a suitable gate scheme for proper functioning of three phase voltage source inverter in 180° operating mode and obtain phase and line voltage waveforms 14M

OR

10. Differentiate CSI and VSI. 14M
