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5th on 19th of Jan

Roll No. 270503

Total Pages : 2

9313

BT-7/D07

POWER ELECTRONICS

Paper – ECE-427 E/ECE-429 E

Opt. (i)

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt *five* questions in all, selecting at least *one* question from each Sections.

SECTION-A

1. Discuss the triggering modes of TRIAC. What is the difference between a Small signal diode/transistor and power diode/transistor ? Compare the operation of self turn-off devices with that of SCR/TRIAC. 20
2. (a) Compare and contrast the gating characteristics of BJTs and MOSFETs. 10
(b) What are the problems of Series connected and Parallel connected diodes and what are the possible solutions ? 10

SECTION-B

3. Discuss the effect of Source inductance on the performance of a single phase full wave fully controlled converter. Draw the output voltage and input current wave shape. Also derive the expression for output voltage in terms of maximum voltage and load current. Assume load current to be constant and continuous. 20

4. (a) Derive a general expression for the mean load voltage of a P-pulse fully controlled converter. 8
- (b) Draw circuit and discuss operations of single phase circulating type dual converter for R-L load. Draw the waveform for the following :
- (i) Output voltage for positive and negative converters.
- (ii) Load voltage waveform.
- (iii) Voltage waveform across CCLR.
- (iv) Current waveform across CCLR. 12

SECTION-C

5. Explain in detail the working of modified McMurray half bridge and full bridge inverters, with necessary waveforms. 20
6. (a) Explain in detail the working of Current source inverter. 12
- (b) Compare and contrast between Voltage source and Current source inverters. Also write down their advantages and disadvantages. 8

SECTION-D

7. (a) Explain the different types of strategies for controlling the output of a chopper. 10
- (b) Explain the principle of operation of Single phase cycloconverters. 10
8. Write short notes on the following :
- (a) MOSFET based chopper.
- (b) Application of Choppers.
- (c) IGBT.
- (d) Performance parameters of a Chopper. $5 \times 4 = 20$

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