Reg. No. : | | | | | | | | | | |

Question Paper Code: 31531

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Fifth Semester

Electrical and Electronics Engineering

01UEE501 - POWER ELECTRONICS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define 'Turn off time' of SCR.
2. Draw TRIAC characteristics.
3. Mention the disadvantages of dual converter with circulating current mode of operation.
4. What is the effect of source impedance on the performance of converter?
5. What is a DC chopper?
6. What is constant frequency control of chopper?
7. List the various advantage of using PWM control to inverters.
8. Write the applications of multilevel inverter.
9. What is a matrix converter?
10. Enumerate some of the industrial applications of cyclo-converter.

PART - B (5 x 16 = 80 Marks)

11. (a) Explain with circuit IGBT static I-V, transfer and turn-on and turn-off characteristics. (16)

Or

(b) Describe the current commutation technique to turn off the SCR with neat sketch and waveform. (16)

12. (a) Discuss the effect of source inductance on the performance of single phase full converter. (16)

Or

(b) Explain the operation of three phase semi converter with neat waveforms. (16)

13. (a) Explain the working of Buck-Boost converter with sketch and waveforms and also drive the expression for I_s. (16)

Or

(b) (i) A dc chopper has an input voltage of 200 *V* and a load of 20 Ω resistance. When chopper is on, its voltage drop is 1.5*V* and the chopping frequency is 10 *kHz*. If the duty cycle is 80%, find (a) average output voltage (b) RMS output voltage (c) chopper on time. (8)

(ii) Describe briefly the working of Dual converter with a neat circuit diagram. (8)

14. (a) Discuss the principle of operation of three phase inverter with 180^o conduction mode with necessary waveforms and circuit. (16)

Or

(b) (i) Explain the working of multilevel inverter. (8)

(ii) With neat sketch explain the different PWM techniques in detail. (8)

15. (a) Explain operating principle of single phase to single phase cyclo-converter with continuous and discontinuous load current with circuit and wave form. (16)

Or

(b) Write short note on the following:

(i) Integral cycle control (4)

(ii) Multistage sequence control (4)

(iii) Step up cycloconverter (4)

(iv) Matrix converter (4)

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