

Reg. No. :

Question Paper Code : 71506

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Fifth Semester

Electrical and Electronics Engineering

EE 2301/EE 51/10133 EE 504/10144 EE 504 — POWER ELECTRONICS

(Common to Instrumentation and Control Engineering)

(Regulation 2008/2010)

(Common to PTEE 2301/10144 EE 504 Power Electronics for B.E. (Part-Time)
Fourth Semester – Electrical and Electronics Engineering — Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw TRIAC characteristic.
2. Draw switching times characteristic of BJT.
3. What is the effect of source impedance on the performance of converter?
4. Draw circuit and waveform of ideal dual converter.
5. What is time ratio control in DC to DC converter.
6. Define current limit control in DC to DC converter.
7. What is Harmonic elimination by PWM?
8. Draw the circuit diagram and waveform of single phase current source inverter.
9. Draw matrix convertor circuit.
10. What is the principle of ON- OFF control of AC controller?

PART B — (5 × 16 = 80 marks)

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

Or

- (b) Describe switching model, equivalent circuit and switching waveforms and times of MOSFET. (16)

12. (a) Explain with circuit and output wave form working of single phase two pulse fully controlled converter with RL load discontinuous current mode of operation. (16)

Or

- (b) With neat sketch describe voltage and current waveforms of a circulating current type dual converter. (16)

13. (a) Describe with basic circuit and waveform the principle of operation step-up converter. (16)

Or

- (b) With neat sketch explain operation of Buck — boost converter with its wave for Continuous current mode of operation. (16)

14. (a) Explain with waveform of three phase inverter for 180° conduction of each thyristor. (16)

Or

- (b) Explain with waveform multiple pulse modulation inverter. (16)

15. (a) Explain with circuit and waveform principle of phase control of single phase controller with RL load and obtain expression for voltage and power factor. (16)

Or

- (b) Explain operating principle of single phase to single phase cycloconverter with continuous and discontinuous load current with circuit and wave form. (16)