24229

B.Tech. 5th Semester (F) Scheme (EE)

Examination, December–2018

POWER ELECTRONICS

Paper–EE-317-F

Time allowed : 3 hours] *[Maximum marks : 100*

Note : Question No. 1 is compulsory. Attempt one question from each section.

1. (a) What is IGBT? Draw its equivalent circuit. 04

(b) What is freewheeling diode? What is the advantage of using it? 04

(c) What is the effect of source impedance on the performance of converter? 04

(d) Define electric drive. Mention advantages and disadvantages of ac drive. 04

(e) What are the main components used for isolating the Power Circuits, Power Semiconductor from the low-power circuit? 04

SECTION-A

2. (a) Describe the working of SCR and its switching characteristics. 10

(b) Explain designing of Snubber circuit. Why it is used? 10

3. Define commutation techniques and explain any two of them in detail. 20

SECTION-B

4. (a) Explain the operation of 3 phase regulator with resistive load. Draw output voltage and current wave form for $\alpha = 60^{\circ}$. 10

(b) For single phase half wave controlled converter system, sketch waveform for load voltage and load current for (1) RL load (2) RL load with freewheeling diode.

5. What is dual converter? Explain non-circulating current mode single phase dual converter. 20

SECTION-C

6. (a) Explain the working principle of single phase current source inverter. 10

(b) What is series inverter? Describe with the help of circuit diagram and suitable waveforms. 10

7. (a) What is the principle of chopper operation? Describe step up chopper in detail. 10

(b) Explain one and two quadrant operation of chopper in detail. 10

SECTION-D

8. (a) What is slip power recovery scheme? Explain working of static Kramer drive. 10

(b) Explain volt/hertz method of speed control of 3 phase induction motor. 10

9. What is the principle of operation for Cycloconverter? Describe single phase to single phase circuit-step down cycloconverter for both continuous and discontinuous load current. 20