

Total number of printed pages-3

53 (IE 615) PWEL

2015

**POWER ELECTRONICS**

Paper : IE 615

Full Marks : 100

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

Answer **any five** questions

1. (a) What is reverse recovery in power diodes? Explain. 7
- (b) What is the significance of holding current and latching current for an SCR? 5
- (c) Explain the characteristics of a power BJT. Also draw the FBSOA and RBSOA of a power BJT. 8
2. (a) Explain the dc voltage equalization in a series combination of SCRs. 6

Contd.

- (b) If in a single phase half wave controlled rectifier with resistive load the firing angle is  $\alpha = 30^\circ$ , then find —
- (i) Form factor
  - (ii) Ripple factor 4
- (c) Explain the working of a three phase half controlled bridge rectifier using neat diagram. 10
3. (a) What is a cycloconverter? Explain the working of a single phase cycloconverter. 8
- (b) What is a chopper? What are the different types of choppers? Explain each. 12
4. (a) Explain a McMurray Bedford inverter. 10
- (b) Draw and explain a chopper with MOSFET. 10
5. (a) Explain the vector control of induction motors. 10
- (b) Explain the buck, boost and buck-boost regulator. 10

6. What is a switched mode power supply ? Explain fly back, pushpull, half bridge and full bridge converters. 20

7. Write short notes on : 10×2=20

(a) IGBT

(b) UPS.

The figures in the margin indicate full marks for the questions.

Answer any five questions

(a) What is reverse recovery in power diodes? Explain.

(b) What is the significance of holding current and latching current for an SCR?

(c) Explain the characteristics of a power transistor.

(d) Explain the current sharing equalization in series combination of SCRs.