

B.TECH SEM – V (2007 COURSE) (ELECTRICAL ENGG.) :

WINTER - 2017

SUBJECT: POWER ELECTRONICS

Day: **Saturday**
Date: **13/01/2018**

W-2017-2460

Time: **02.30 PM TO 05.30 PM**
Max. Marks: **80**

N.B.:

- 1) **Q. No. and Q. No. 5** are **COMPULSORY**. Out of the remaining attempt any **TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SAME** answer book.
- 4) Draw diagrams **WHEREVER** necessary.

SECTION-I

- Q.1**
- a) What are the dv/dt and di/dt rating of SCR? What happens if those rating exceeds? (06)
 - b) Define: (04)
 - i) Ripple factor
 - ii) Rectification efficiency
 - c) Draw and explain the switching characteristics of IGBT, in brief. (04)
- Q.2**
- a) What are the causes of voltages transients on load side and supply side? How are these transients suppressed? (07)
 - b) What is commutation of SCR? What are the different classes of forces communication method? (06)
- Q.3**
- a) Explain the N- channel MOSFET in detail with diagram. (07)
 - b) Explain single phase fully controlled bridge converter with waveforms. (06)
- Q.4**
- a) What is modulation index? How it controls the output voltage and frequency? (05)
 - b) Compare the ideal dual converter mode with non-ideal dual converter mode with neat diagrams. (08)

SECTION – II

- Q.5**
- a) Write a note on PWM technique used in PWM inverter. (04)
 - b) Explain with neat sketch CLASS A type chopper. (05)
 - c) Compare between VSI and CSI (05)
- Q.6**
- a) Differentiate with sketches step up chopper and step down chopper. (07)
 - b) Derive an expression for average load current for class B chopper. (06)
- Q.7**
- a) Explain with waveform 120° mode of operation of three phase bridge inverter. (08)
 - b) Explain with circuit diagram and waveforms for single phase series inverter. (05)
- Q.8**
- a) Explain the working of voltage source inverter with a neat circuit diagram. Also state its advantages. (07)
 - b) Explain the following parameters in reference with inverter: (06)
 - i) Harmonic factor
 - ii) Total Harmonic distortion
 - iii) Lowest order Harmonic