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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIRST SEMESTER M.TECH DEGREE EXAMINATION, JUNE/JULY 2018**

**Branch: Electrical & Electronics Engineering**  
**Stream: Power Control and Drives**  
**01EE6501: POWER CONVERTER CIRCUITS**

*Answer any two full questions from each part*  
*Limit answers to the required points.*

Max. Marks: 60

Duration: 3 hours

**PART - A**

1. a) Explain the effect of source inductance in a  $1\Phi$  half bridge diode rectifier having highly inductive load. Draw the relevant waveforms (6)  
b) Explain line current distortion. (3)
2. A  $1\Phi$  full bridge diode rectifier has a purely resistive load. Determine  
i) Efficiency. ii) Form factor iii) Ripple factor. iv) Transformer utilisation factor v) PIV of each diode. The rectifier delivers a current of 60A at an output voltage of 280.7V and source frequency 60Hz. (9)
3. a) Draw and explain the static and dynamic characteristics of an ideal switch. (5)  
b) Briefly explain the losses present in a practical switch (4)

**PART - B**

4. Explain the operation of a Boost converter with circuit diagram and relevant waveforms. Derive the expression for L& C (9)

5. Explain the operation of a Converter in which output voltage is less than input voltage with circuit diagram and relevant waveform. Derive the expression for L and C. (9)
6. a) A  $1\Phi$  full wave controlled rectifier is connected to a highly inductive load. i) Draw the output voltage, output current and input current for a firing angle of  $60^\circ$ . (5)
- b) Explain the control methods of DC DC converter (4)

**PART - C**

7. a) Explain the methods of harmonic elimination in PWM inverters. (6)  
b) Write short notes on Full bridge dc-dc converter (6)
8. Explain the operation of 3 phase inverter with  $180^\circ$  conduction with circuit diagram and relevant waveforms. (12)
9. a) Draw the circuit diagram and explain the operation of a pushpull converter for continuous conduction mode. Give relevant waveforms. Derive the voltage transfer ratio (8)  
b) Compare linear and switched mode power supplies (4)