

**M. TECH.**  
**(SEM-III) THEORY EXAMINATION 2018-19**  
**POWER CONVERTER APPLICATIONS**

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If require any missing data; then choose suitably.

## SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20
- a. What are the applications of ac voltage controllers?
  - b. Define UPFC.
  - c. What are the various types of Power Supplies?
  - d. What losses occur in a thyristor during working conditions?
  - e. Define electric welding control.
  - f. Define UPS.
  - g. What are the applications of a twelve pulse converters?
  - h. Give two application of Utility Grid.
  - i. Define ac voltage controllers.
  - j. What are the various methods of Power Generation?

## SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30
- a. Explain HVDC Transmission with the help of Schematic diagram.
  - b. Explain the Concept of static VAR control. What are its advantages and applications?
  - c. Explain the operation of unified power flow controller (UPFC).
  - d. Explain the concept of Interconnection of Renewable Energy Sources to the Utility Grid.
  - e. Explain excitation control of synchronous generators with neat diagram.

## SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Explain the operation of a Three-Phase 12 Pulse converter along the necessary circuit diagrams and wave forms.
  - (b) What are the various convertors faults? How it can be protected.
4. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Explain the concept of ac voltage controllers for resistance heating and illumination control.
  - (b) Explain with neat diagram high frequency inverters for induction heating.
5. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Write short notes on
    - (i) UPS
    - (ii) Aircraft power supplies.
  - (b) Explain the principle of thyristors controlled VAR compensation techniques.
6. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Explain the various modes of operation of HVDC Transmission.
  - (b) Explain the operation of 1 $\phi$  sinusoidal AC voltage controller.
7. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Explain Switched mode dc power supplies in detail. Give its applications.
  - (b) Write short notes on
    - (i) Harmonic filters
    - (ii) Power factor correction capacitors