

Roll No. ....

Total Pages : 2

**007701**

**December 2023**

**B.Tech. 7th Semester**

**(EL)-POWER QUALITY AND  
FACTS (ELPE-713)**

Time : 3 Hours]

[Max. Marks : 75

*Instructions :*

1. *Question No. 1 is compulsory from Part-I.*
2. *Attempt any four questions from Part-II.*

**PART-A**

1. (a) What is the need of Series Compensation in E.H.V. transmission line?  
(b) How does TCSC damp power oscillations?  
(c) STATCOM is very effective for Voltage control during voltage collapse. Explain why?  
(d) Enumerate the applications of Multi-Level inverters.  
(e) SSSC is SSR neutral. Explain.  
(f) What are the causes of Voltage Sag and Swells?  
(g) Define notching and its cause.  
(h) Enumerate the causes of harmonics?  
(i) What is load compensation?  
(j) Enumerate the applications of Series active filter.

(1.5×10=15)

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## PART-B

2. (a) Explain the principle of operation and V-I characteristics of SVC in 3 transmission line. (8)
- (b) Explain the various operating modes of operation of TCSC. (7)
3. (a) Explain the principle of operation and applications of STATCOM. (8)
- (b) Explain Space Vector modulation technique for Multilevel inverter. (7)
4. (a) Explain the principle of operation and applications of GTO controlled series compensator. (8)
- (b) Explain power flow control by SSSC. How is Resistance compensated by SSSC? (7)
5. (a) Explain Instantaneous Reactive power theory for finding reference currents for shunt active power filter. (8)
- (b) Explain the working of 5 level flying capacitor multilevel inverter with switching table and waveform. (7)
6. Explain working principle, control methods and applications of unified power quality conditioner (UPQC). (15)
7. (a) Explain selective harmonic elimination PWM method for multilevel inverter. (7)
- (b) Explain various causes and ill effects of harmonics in the power system. (8)