

Roll No. : .....

Total No. of Questions : 9 ]

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**B.Tech. (EE) 6th Semester (Supplementary)**  
**Examination, July-2021**  
(G Scheme) (Elective-IV)

**POWER QUALITY AND FACTS**  
Paper-PEC-EE-08-G

*Time : Three Hours ]*

*[ Maximum Marks : 75*

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*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

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**Note :-** Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.

1. (a) Discuss the factors which limit the loading capability of a power system.
- (b) Why electrical transmission systems are interconnected ?

- (c) Define Voltage Sag.
- (d) Define CBEMA Curves.
- (e) Explain the basic control scheme of TCR.
- (f) Explain Fault Current Limiter.  $2\frac{1}{2} \times 6 = 15$

#### Section-A

- 2. (a) Explain analysis of uncompensated AC transmission line.
- (b) Compare Series and Shunt Compensation.  $7\frac{1}{2}, 7\frac{1}{2}$
- 3. (a) Discuss the benefits from FACTS Controllers.
- (b) Explain the working and characteristics of Thyristor Controlled Series Capacitor.  $7\frac{1}{2}, 7\frac{1}{2}$

#### Section-B

- 4. (a) Discuss the basic concept of voltage source converter with circuit diagram.
- (b) Explain the operation of STATCOM with the aid of block diagram.  $7\frac{1}{2}, 7\frac{1}{2}$

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- 5. (a) Discuss the working principle of Unified Power Flow Controller.
  - (b) Discuss the working principle of Static Synchronous Series Compensator.  $7\frac{1}{2}, 7\frac{1}{2}$
- Section-C**      15 each
- 6. Discuss voltage regulation of transmission mid-point voltage using a STATCOM.
  - 7. Explain in detail power quality problems in DC Distribution System.

#### Section-D

15 each

- 8. Discuss in detail the synchronous reference frame extraction of reference currents in DSTATCOM.
- 9. Explain working principle of Unified Power Quality Conditioner (UPQC). Discuss various control strategies.

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