

Roll No.:.....

# National Institute of Technology, Delhi

Name of the Examination: B. Tech.

Branch : EEE

Semester : 7<sup>th</sup>

Title of the Course : HVDC & FACTS

Course Code : EE402

Time: 2 Hours

Maximum Marks: 30

**Note :** 1. Answer all the questions.

2. Do not write anything on the question paper except Roll number

3. Assume any data suitably if found missing

**Q.1.** What is FACTS? Explain different types of FACTS based on the steady state power flow equation for  $(x/r > 7)$ . [3]

**Q.2** Compare the rating of series and shunt FACTS for midpoint compensation. [4]

**Q.3** Explain the different applications of shunt FACTS compensators. [5]

**Q.4** For 735kV, 50Hz, 800km long symmetrical line having inductance 0.932mH/km and capacitance = 12.2nF/km. Find the following: [6]

- i. Surge impedance
- ii. Surge Impedance loading
- iii. Active power transmitted
- iv. Reactive power required to keep mid-point voltage ( $V_m$ ) at 1.05pu.
- v. Active power transmitted for  $V_m=1.05$ pu.

**Q.5** Explain the following FACTS devices with suitable characteristics and figures. [2×3=6]

- i. TCR
- ii. TSC
- iii. TCSC

**Q.6** Explain the different characteristics of SVC. Clarify the advantages of slope. [6]