Code No: **R164202B** **R16** **Set No. 1**

IV B.Tech II Semester Advanced Supplementary Examinations, Aug/Sep - 2022

FLEXIBLE ALTERNATING CURRENT TRANSMISSION SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) What are the basic types of FACTS controllers? [2]
   b) How is Square wave voltage harmonics defined? [2]
   c) What do you mean by power oscillation damping [2]
   d) Distinguish between thyristor-controlled reactor and thyristor switched capacitor [3]
   e) List the objectives of Series compensation [3]
   f) Draw the schematic diagram of UPFC [2]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the various stability issues that limit the transmission capacity [7]
   b) List and explain the requirements and characteristics of high power devices in FACTS devices [7]

3. a) Explain the operation of a three phase full wave voltage sourced converter with necessary supporting waveforms [7]
   b) Compare current source converter with voltage source converter. [7]

4. a) Explain in detail about the Two – machine power system with an ideal midpoint reactive compensator with corresponding phasor diagram [7]
   b) Describe the improvement of transient stability with shunt compensation. [7]

5. a) Explain the functional control scheme of the Fixed capacitor, Thyristor – controlled reactor type static VAR generator [7]
   b) Write about summary of compensation control. [7]

6. a) Describe the concept of series capacitive compensation. [7]
   b) Explain the operation of GTO – controlled series capacitor with relevant waveforms [7]

7. Write short notes on the following:
   i)operation of Unified power flow controller [7]
   ii)comparison of UPFC to controlled Series compensators [7]