U.S.N

P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Seventh Semester, B.E. - Electrical and Electronics Engineering
Semester End Examination; Jan. / Feb. - 2021
Flexible AC Transmission Systems

Time: 3 hrs   Max. Marks: 100

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

1 a.	With the help of schematic diagram, explain different basic types of FACTS controllers.	10
b.	Explain the power flow in a meshed system.	10
2 a.	With neat sketches, explain the power flow and dynamic stability considerations of a transmission inter connection.	14
b.	Explain the relative importance of controllable parameters.	6

UNIT - II

3 a.	Explain the basic concept of voltage source converter and a single value operation.	10
b.	With a neat sketch, explain the operation of single phase full wave voltage source converter.	10
4 a.	Explain the converter operation of 3 phase full wave bridge converter.	14
b.	From the fundamentals, derive an equation for RMS fundamental component of square wave AC voltage V_{ab}.	6

UNIT - III

5 a.	Explain 3 phase full wave diode rectifier operation with neat circuit and waveforms.	10
b.	Mention the advantages and disadvantages of current sourced versus voltage sourced converter.	10
6 a.	With neat circuit and waveforms, explain the commutation process in current sourced converter.	10
b.	Explain 3 phase full wave diode rectifier operation with neat circuit and waveforms with commutation angle γ_o.	10

UNIT - IV

7 a.	What are the objectives of shunt compensation? Show that midpoint shunt compensation can significantly increase the transmittable power.	12
b.	With neat circuit and VI characteristics explain thyristor switched capacitor.	8
8 a.	Explain how transient stability can be enhanced by SVC and STATCOM?	10
b.	With related waveforms explain power oscillation damping by reactive shunt compensation.	10

UNIT - V

9 a.	With related circuit and waveforms, explain the concept of series capacitive compensation.	10
b.	Explain the operating principle of GCSC with relevant waveforms.	10
10 a.	With related circuit and phasor diagram, explain the operation of SSSC.	10
b.	With related waveforms, explain sub-synchronous oscillation damping.	10

∗ ∗ ∗