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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Electrical and Electronics Engineering

Semester End Examination; May/June - 2018

Flexible AC Transmission System

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 Phasor diagram, explain the power flow and dynamic stability of transmission interconnection of a two machine system. 10

b. Explain in detail the controlling parameters by FACTS controller. Mention the exact location where the FACTS controllers are installed in AC transmission system? 10

2 a. With the help of schematic diagram, explain different types of FACTS controller. 10

b. Explain in detail the benefits of FACTS devices. 10

UNIT - II

3 a. With neat sketch, explain the operation of single phase full wave voltage source converter by representing current and voltage phase relationship. 12

b. From fundamentals, derive an equation for rms fundamental component of a square wave AC voltage V_{ab}. 8

4 a. With the help of circuit diagram, explain the operation of three phase full wave voltage sourced converter. Also draw phase-to-phase voltage and phase-to-neutral voltage waveforms. 12

b. Explain the fundamentals and harmonics for a three phase bridge inverter. Hence derive equation for V_{an}. 8

UNIT - III

5 a. With a neat sketch, explain the classification of current source converters. 8

b. Explain with circuit and waveforms the operation of three phase full wave six pulse diode converter circuits. Also obtain the equation for the rms value of phase current. 12

6 a. Explain the operation of self-commutating six pulse current source converters. Clearly mention the commutating process with the help of current wave forms. 10

b. List the advantages and disadvantages of current source converter versus voltage source converter. 10

UNIT - IV

7 a. With neat diagram and its VI characteristics, explain Thyristor Switched Capacitor (TSC). 10

b. Compare the performance of SVC and STATCOM. Mention the application of each. 10

8 a. With neat diagram and its VI Characteristics, discuss the principle of operation of STATCOM. 10

b. Explain the variation of transmission line voltage in transient stability enhancement. 10

Contd…2

UNIT - V

9 a.	Explain the operating principle of GCSC with relevant waveforms.	10
b.	Explain the operation and impedance characteristics of TCSC.	10
10 a.	With a neat block diagram, explain the external control scheme for series reactive components.	10
b.	What is SSSC? How it operates as a series compensator? Mention the differences between SSSC and TCSC.	10

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