

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Scheme for Valuation/Answer Key

Scheme of evaluation (marks in brackets) and answers of problems/key

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: EE464

Course Name: Flexible AC Transmission Systems

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 5 marks.

		Marks
1	Definition (2Marks). Devices names (3 Marks)	(5)
2	Reactive power compensation at load centre, Shunt reactive power compensation by capacitor or DSTATCOM (3), Voltage profile of radial line for different loading levels (2),	(5)
3	Methods for controllable static VAR generation –Impedance type(switching in and out capacitor and inductor) , Converter type(injecting voltage in series or drawing or injecting current) , series, Shunt methods (5)	(5)
4	The basic concept of voltage and phase angle regulation is the <i>addition of an appropriate in-phase or a quadrature component</i> to the prevailing terminal voltage.(2) <i>addition of an appropriate in-phase voltage –Voltage regulator, addition of an appropriate quadrature component voltage- Phase angle regulator, phasor</i> (3)	(5)
5	Schematic, Principle of shunt current injection, Equation, (2+2+1)	(5)
6	Schematic of SSSC and Series Capacitor compensation (2) Phasor (1)	(5)
	In contrast to the series capacitor, the sssc is able to maintain a constant compensating voltage in the presence of variable line current. It can control the amplitude of the injected compensating voltage (V_q) independent of the amplitude of the line current.(2)	
7	voltage, impedance, and phase angle, active power flow, reactive power (1+1+1+1+1)	(5)
8	IPFC schematic (2) Working (3)	(5)

PART B

Answer any two full questions, each carries 10 marks.

9	Series capacitor compensation (2), Equation for active and reactive power	(10)
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- flow(2+2) , active power flow(2) reactive power plot with power angle and explanation (2)
- 10 Comparison with V I characteristics and explanation of STATCOM, TCR, TSC, (10) and SSSC, TCSC (5+5)
- 11 Equal area criterion- stability limit with compensation and without (10) compensation (5) explanation(5)

PART C

Answer any two full questions, each carries 10 marks.

- 12 Schematics and VI characteristics, explanation TCR (3) (10)
Schematics and VI characteristics, explanation TSC (3)
Schematics and Q characteristics, explanation FC-TCR (4)
- 13 a) Schematic (4) Explanation (3) (7)
b) Phasor (3)
- 14 a) VI characteristics of TCSC- voltage control (2) reactance control(2) (4)
b) TCSC schematics (3) explanation(3) (6)

PART D

Answer any two full questions, each carries 10 marks.

- 15 Neat Schematic(5) Explanation (5) (10)
- 16 a) Schematic (4) (4)
b) Role of series converter- series voltage injection, series compensation, reactive power compensation, active power compensation with dc link and series converter, shunt converter- Current injection or drawing, reactive compensation, Active power supply to DC link and DC link- extraction of active power demanded by series converter from ac line through shunt converter. (2+2+2) (6)
- 17 Comparison of features and V I characteristics(5x2) (10)
