Reg. No.															

Question Paper Code	13392

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Eighth Semester

Electrical and Electronics Engineering

20EEEL801 - FACTS AND CUSTOM POWR DEVICES

Regulations - 2020

Duration: 3 Hours Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	The unit of reactive power is: (a) Watts (W) (b) Volt-ampere (VA) (c) Volt-ampere reactive (VAR) (d) Amperes (A)	1	K1	CO1
2.	Power factor correction is important because it: (a) Increases the transmission line losses (b) Decreases the need for reactive power. (c) Increases the system stability (d) Reduces the voltage regulation requirements	1	K1	CO1
3.	What is the primary purpose of an SVC in voltage control? (a) To increase the voltage during high load conditions (b) To decrease the voltage during low load conditions (c) To maintain a constant voltage at the bus. (d) To regulate frequency across the power system	1	K1	CO2
4.	Which of the following modes of operation is possible for a TCSC? (a) Fixed reactance mode (b) Adjustable reactance mode (c) Both fixed and adjustable reactance mode. (d) Only constant voltage mode	1	K1	CO2
5.	What source does the STATCOM's dc voltage usually come from? (a) An energy-storage capacitor (b) A fossil fuel generator (c) A piezoelectric device (d) A wind turbine	1	K1	CO3
6.	When the converter-operated STATCOM supplies reactive-output power, what must the real power provided by the dc source be? (a) Positive (b) Zero (c) Equal to the reactive-output power (d) Negative	1	K1	CO3
7.	The main purpose of an SSSC is to be (a) Control voltage only (b) Generate real power (c) Control real and reactive power flow through a transmission line (d) Measure system frequency	1	K1	CO4
8.	IPFC is mainly used to (a) Improve energy storage (b) Operate diesel generators (c) Control power flow among multiple transmission lines (d) Replace circuit breakers	1	K1	CO4
9.	Which device is commonly used in DVRs for fast response? (a) Thyristor (b) IGBT or IGCT (c) Relay (d) Transformer	1	K1	CO5
10.	What is the primary purpose of a Power Swing Damping Controller (PSDC)? (a) To increase power generation (b) To damp oscillations in power systems (c) To enhance power transmission efficiency (d) To reduce the cost of electricity	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	What are the design factors to be considered for the series compensators?	2	K2	CO1
12.	Mention the uses of series compensation.	2	K2	CO1
13.	Explain the load sharing of two parallel connected SVC's.	2	K2	CO2

14.	Write any two applications of synchronous condensers.	2	K2	CO2
15.	Differentiate between STATCOM and SVC.	2	K2	CO3
16.	Write short notes on principle of operation of STATCOM.	2	K2	CO3
17.	Discuss any two applications of SSSC.	2	K2	CO4
18.	Discuss a note on IPFC.	2	K2	CO4
19.	Compare DSTATCOM and DVR.	2	K2	CO5
20.	Discuss the type of energy storage is used in UPQC.	2	K2	CO5
21.	Write short notes on adaptive controller.	2	K2	CO6
22.	Write a note on swing equation.	2	K2	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain in detail about the classification of different FACTS controller.	11	K2	CO1
		OR			
	b)	Explain the effect of shunt and series compensation on power transmission capacity of a short symmetrical transmission line.	11	K2	CO1
24.	a)	Using a general schematic diagram, explain the three basic modes of SVC control in detail.	11	K2	CO2
		OR			
	b)	Describe the modeling of TCSC for load flow study.	11	K2	CO2
25.	a)	Explain with a neat sketch, the operating principle, V-I characteristic & application of static synchronous compensator.	11	K3	CO3
		OR			
	b)	Explain the modeling of UPFC power flow studies.	11	K3	CO3
26.	a)	Explain the different operating modes of SSSC for real and reactive power exchange.	11	K2	CO4
		OR			
	b)	Draw schematic diagram and describe the basic operating principles of Interline power flow controller.	11	K2	CO4
27.	a)	Explain the principle and working of DSTATCOM.	11	K2	CO5
		OR			
	b)	Explain about harmonic elimination using right shunt UPQC.	11	K2	CO5
28.	a)	Discuss the physical interpretation of the swing equation and explain its role in power system stability.	11	K3	CO6
		OR			
	b)	Design a scheme adopts two deadbeat controllers to regulate the inner current loop and the outer voltage loop of the PWM inverter.	11	K3	CO6