QPC: RN18001206 AR - 18 Reg. No. | | | | | | | | | | |

GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, November – 2021

(Seventh Semester)

BELPE7021 / BEEPE7021 – FLEXIBLE AC TRANSMISSION SYSTEM

(EE / EEE)

Time: 3 hrs Maximum: 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) (2 x 10 =20 Marks)

Q.1. Answer *ALL* questions		[CO#]	[PO#]
a.	Voltage control means	CO1	PO1
	(i) Boosting the feeder voltage (ii) Reducing the line voltage under over voltage conditions		
	(iii) Keeping the voltage level within the allowable limits. (iv) None		
b.	FACTS devices are generally used for to compensate_____of the transmission line	CO1	PO1
	(i) reactive power (ii) active power		
	(iii) apparent power (iv)all the above		
c.	Transmission efficiency increases as	CO2	PO1
	(i) voltage and power factor both increase (ii) voltage and power factor both decrease		
	(iii) voltage increases but power factor decreases (iv) voltage decreases but power factor increases.		
d.	SVC and STATCOM are_____ devices.	CO2	PO1
	(i) series (ii) series and shunt		
	(iii) shunt and series (iv) shunt		
e.	STATCOM is_____ regulating device	CO2	PO1
	(i) Current (ii) Voltage		
	(iii) Current and Voltage (iv) Power factor		
f.	The main Objective of series compensation	CO3	PO1
	(i) It improve the power factor (ii) It reduces the fault currents		
	(iii) Reduce the voltage drop over long distance (iv) None		
g.	Transmission Interconnection is done for	CO1	PO1
	(i) economic reasons (ii) to reduce the cost of electricity		
	(iii) to improve reliability of power supply (iv) All of these		
h.	Unified Power Flow Controller (UPFC) is combination of _____	CO4	PO1
	(i) STATCOM and TCSC (ii) SSSC and TSC		
	(iii) STATCOM and SSSC (iv) TSSC and TCR		
i.	Objectives of Load compensation_____	CO4	PO1
	(i) Power-factor correction. (ii) Improvement of voltage regulation.		
	(iii) Load balancing (iv) All of these		
j.	List of Static Series compensators.	CO3	PO1
	(i) TCR, TSR, TSSC, TSC (ii) GCSC, TCSC, TSSC		
	(iii) TSSC, TCSC, SVG, SVS (iv) SVG, SVC, TCR, TSR		

PART – B: (Short Answer Questions) **(2 x 10=20 Marks)**

Q.2. Answer ***ALL*** questions		[CO#]	[PO#]
a.	Define FACTS controllers as per IEEE definition?	CO1	PO1
b.	List out various types of power flow in Ac system?	CO1	PO1
c.	What are the objectives of shunt compensation?	CO1	PO1
d.	Why VSC is preferred over CSC?	CO2	PO1
e.	Differentiate between an UPFC & IPFC	CO4	PO1
f.	Explain about natural commutation?	CO3	PO1
g.	Explain the concept of reactive power in brief?	CO2	PO1
h.	Explain about Capacitive series compensation?	CO2	PO1
i.	What are the effects of injecting voltage in series with a transmission line?	CO1	PO1
j.	List out various series compensators?	CO1	PO1

PART – C: (Long Answer Questions) **(15 x 4= 60 Marks)**

Answer *ALL* questions		**Marks**	**[CO#]**	**[PO#]**
3. a.	Explain the working principle & V – I characteristics of STATCOM?	10	CO2	PO1
b.	Explain the basic control of TCR?	5	CO1	PO1
	(OR)			
c.	Explain what do you mean by Variable Impedance type FACTS devices?	5	CO1	PO1
d.	Explain the power flow and dynamic stability considerations of a transmission interconnection	10	CO2	PO1
4. a.	Explain with a neat sketch and various modes of operation of TCSC type of series controller	12	CO3	PO1
b.	How series FACTS devices respond to the problem of Sub synchronous resonance	3	CO3	PO1
	(OR)			
c.	Explain how real and reactive power flow control is achieved using quadrature booster.	10	CO3	PO1
d.	Explain the concept of thyristor control voltage regulator?	5	CO3	PO1
5. a.	Explain how series compensation can be used for power oscillation damping	8	CO3	PO1
b.	How amount of power can be controlled in Mesh connected ac power system?	7	CO1	PO2
	(OR)			
c.	Draw the neat sketch of SVC and explain its operating principle?	10	CO1	PO1
d.	Explain various operational characteristics of GCSC?	5	CO3	PO1
6. a.	Discuss the block diagram for IPFC control scheme	10	CO4	PO1
b.	Describe briefly steady state stability and transient stability?	5	CO1	PO1
	(OR)			
c.	Write short notes on sub synchronous harmonics and sub synchronous frequency	8	CO2	PO1
d.	Differentiate between TCSC & SSSC?	7	CO3	PO1

--- End of Paper ---