



Reg.No. _____

End Semester Examination – Nov/Dec – 2016

Code : 14EE2027

Sub. Name : HVDC and FACTS

Semester : 2016-17 ODD

Duration : 3hrs

Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Marks
1.	a.	Enumerate the continuing technological developments contribute to reduce the cost of HVDC converter stations while improving the reliability and performance	10
	b.	Summarize the operating problems have surfaced that affected reliable operation and in few cases even lead to catastrophic failures of HVDC Technology	10
(OR)			
2.	a.	Discuss in detail the relative merits of the two modes of transmission which need to be considered by a system planner are based on economics of transmission, technical performance and reliability	10
	b.	Explain the VSC based HVDC Transmission system with its advantages.	10
3.	a.	Discuss in detail the HVDC converter control characteristics, negative current margin and modified characteristics including VDCOL	10
	b.	Explain in detail the starting and stopping of a HVDC Link in terms of [a] Energisation and De-energisation of a bridge, [b] Start-up of DC Link	10
(OR)			
4.	a.	A monopolar HVDC link has one bridge at each terminal. The parameters of the link are $\alpha_{\min} = 5^\circ$, $\gamma_{\min} = 18^\circ$, $R_d = 5$ ohms, $R_{cr} = 12$ ohms, $V_{dor} = 115$ kV, I_{ref} at the rectifier = 1 kA, I_{ref} at the inverter = 900 A, [a] If $V_{doi} = 117.5$ kV, Calculate α , γ , P_i , and Q_i [b] Repeat [a] if $V_{doi} = 120$ kV	10
	b.	Discuss with the block diagram of basic power and auxiliary controller including the generic model of VDCOL	10
5.	a.	Summarize the basics of power transmission networks with single line diagram and equivalent circuit.	10
	b.	Discuss about Control of Power Flow in AC Transmission Line.	10
(OR)			
6.	a.	Describe the Compensation by a Series Capacitor Connected at the Midpoint of the Line.	10
	b.	Explain the Shunt Compensation Connected at the Midpoint of the Line.	10
7.	a.	Explain the Principle of Operation of STATCOM.	10
	b.	Explain about A Typical SVC (TSC-TCR) Configuration	10
(OR)			
8.	a.	Analyze A transmission line with SVC connected at midpoint with its Control characteristic	10
	b.	Describe the Basic Concepts of Controlled Series Compensation [TCSC].	10
<u>Compulsory:</u>			
9.	a.	The Unified Power Flow Controller (UPFC) proposed by Gyugyi is the most versatile FACTS controller – Discuss in detail.	10
	b.	Explain the operation of UPFC Connected at the Receiving End	10

ALL THE BEST