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Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, May 2013  
(2008 Scheme)  
08.805 Elective – IV (e) : HVDC AND FACTS**

Time : 3 Hours

Max. Marks : 100

**Instruction :** Answer **all** questions in Part **A** and **two** questions **each** from **each** Module in Part **B**.

**PART – A**

1. How is reactive power compensation significant for voltage support ?
2. List the different types of FACTS devices and their control variables.
3. What is the difference in placing reactive power supporting devices on transmission systems at (i) midpoint and (ii) receiving end ?
4. Draw the VI characteristics of a typical SVC. Explain each section.
5. Differentiate and compares TCSC and SSSC.
6. Which are the FACTS devices used for enhancing the transmission capacity of lines ?
7. List the different converter station equipments used in HVDC transmission.
8. What is the challenge in DC circuit breaking ?
9. Can HVDC line be connected in parallel to HVAC line ? Justify qualitatively.
10. What do you mean by monopolar operation ? (10×4=40 Marks)

P.T.O.



## PART – B

## Module – I

11. A 735 kV symmetrical lossless transmission line with  $L = 0.932$  mH/km,  $C = 12.2$  nF/km and a line length of 800 km is operated at 50 Hz. What is the midpoint voltage corresponding to the maximum power transfer through the line? A series capacitor is connected at the midpoint of the line to double the power transmitted. What is its reactance? (5+5)
12. What is distributed compensation? Compare the same with lumped passive discrete compensation. 10
13. What are the components in shunt connected and series connected compensators? 10
14. What are various methods of load compensation? 10

## Module – II

15. What are the components in an SVC? 10
16. Explain the principle of operation of TCPAR. 10
17. What are the different operating modes of TCSC? 10
18. What are the operating configurations of STATCOM? 10

## Module – III

19. What do you mean by DC links? What are the different types? 10
20. Draw and explain Graetz circuit. 10
21. How can power flow be controlled through an HVDC line? 10
22. Draw a typical control characteristic of HVDC line using typical constant current/constant extinction/constant ignition angle control. 10
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