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**Question Paper Code: 55007**

Ph.D COURSE WORK EXAMINATION, NOV 2018

Elective

Course work

15PPE507 - POWER CONTROLLERS IN POWER SYSTEMS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1. (a) (i) Discuss the benefits of FACTS controllers. CO1- U (4)  
(ii) Draw the single line diagrams of TCSC, STATCOM, SSSC and UPFC. CO1- U (12)  
(iii) What are the factors which limit loading capability? CO1- U (4)

Or

- (b) (i) Describe the effect of series and shunt compensation at mid-point of the line. CO1- U (12)  
(ii) How is the reactive power controlled, using FACTS devices ? CO1- U (4)  
(iii) State the application of FACTS Controllers in Distribution Systems. CO1- U (4)
2. (a) (i) Explain the voltage control action by SVC with necessary diagrams. CO2-U (16)  
(ii) List the advantages of slope in dynamic characteristics of SVC. CO2-U (4)

Or

- (b) Explain how the SVC will be able to regulate the HVAC bus voltage. Derive the V-I characteristics of power system and SVC(FC+TCR). CO2-U (20)

3. (a) (i) Explain the constant power control model of TCSC with the block-diagram. CO3- U (10)
- (ii) What are the important limits that are considered in the capability characteristics of TCSC. CO3- U (10)
- Or
- (b) Explain the modeling and control of TCSC in providing effective voltage compensation. CO3- U (20)
4. (a) (i) Explain the principle of operation of STATCOM. CO4- U (10)
- (ii) What are the various ways of controlling the output voltage of STATCOM. Explain them with necessary block-diagrams. CO4- U (10)
- Or
- (b) (i) Explain the operation of SSSC. CO4- U (10)
- (ii) Compare the performance of SSSC with that of fixed series capacitor compensation. CO4- Ana (10)
5. (a) Elucidate the need for SVC- SVC interaction. CO5-Ana (20)
- Or
- (b) Describe the basic procedure for controller design or the coordination of multiple controllers using linear control techniques. CO5-U (20)
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