



B.E./B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2012

ELECTRICAL AND ELECTRONICS ENGINEERING

SEMESTER VII – (REGULATIONS 2008)

EE 9037 EHV POWER TRANSMISSION

Time:3 hrs

Max Marks:100

Answer ALL Questions

Part A – (10×2=20)

1. Distinguish between single circuit and double circuit line.
2. Write down the equation for power handling capacity of line and draw graph for power versus angle.
3. What is meant by bundle spacing?
4. Explain briefly about ACSR.
5. Mention the additional equipment needed for HVDC substation compared to HVAC substation
6. How is power controlled in HVDC system?
7. Write down the role of STATCOM in power system
8. What is meant by series compensation?
9. What is meant by secondary shock current?
10. How are electrostatic and electromagnetic fields caused?

Part B – (5×16=80)

11.(i) Derive the expressions for total power loss and percentage power loss in a three phase line. (8)

(ii) A power of 10,000 MW is required to be transmitted over a distance of 1200 km at voltage levels of 400kV and 750 kV. Determine number of circuits required ($\delta=30^\circ$), total power loss and percentage loss. Compare and write your comments

(8)

kV	R, ohm/km	X, ohm/km
400	0.031	0.327
750	0.0136	0.272

12. a. Explain the procedure for constructing capacitance matrix for three conductor untransposed and transposed systems. (16)

OR

b. Describe various types of modes of propagation. Also explain their applications. (16)

13. a. Discuss the various types of HVDC links with suitable diagrams and state advantages and disadvantages over HVAC systems. (16)

OR

b. Draw equivalent circuits of converter and inverter with suitable expressions. (16)

14. a. Discuss the necessity of reactive power control in power systems. Explain the role of SVC in power systems. (16)

OR

b. Write short notes on thyristor controlled series capacitor and UPFC. (16)

15. a. Explain the basic principle used for measuring electrostatic field of EHV line. Write down the measuring procedure and application rules followed. (16)

OR

b. Describe the effect of electrostatic field due to EHV line on living organisms, heavy vehicles and power lines. (16)