Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.TECH (EE)/SEM-2/EDPM-201/2013

2013

EHV AC POWER TRANSMISSION

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

Answer any *seven* questions. 7 × 2 = 14

1. a) What is the highet generation and transmission voltage in India ?

   b) How are transmittable active and reactive powers varied ?

   c) Why are capacitors connected in transmission line ? Why are they connected in parallel ?

   d) What is Ferranti effect ?

   e) Distinguish overhead transmission lines according to their distance.

   f) What is SIL ?

g) Mention the disadvantages of poor power factor.

h) Why does voltage fall at heavy load ?

i) Why does power transmission decrease with increasing the line length ?

j) Why is compensation required in transmission line ?

GROUP – B

Answer any *four* questions. 4 × 14 = 56

2. a) If V_s , V_r and V_m are the values of sending end, receiving end and mid-point voltages of a power system, then derive the expression of active and reactive power flow.

b) Why is power transmitted at high voltage ? 10 + 4

3. Explain ideal shunt compensation clearly mentioning changes of active power flow, reactive power flow. Draw the required phasor diagram.

4. a) What is transient stability ?

b) With $P - \delta$ curve explain what is transient stability limit.

c) Explain how this limit can be improved by shunt, series and phase compensations. 2 + 3 + (3 × 3)

5. a) How does an SAV work ?

b) Draw and explain $V - I$ characteristics of SVC.

c) What is the basic operation of TCSC ? 5 + 4 + 5

6. a) Why is STATCOM used ?

   b) Explain basic operation of STATCOM with steady state power exchange diagram, *V-I* characteristics.

   c) How can transient stability be improved with STATCOM ? 2 + 8 + 4

7. a) Discuss the basic concepts of UPFC.

   b) How is it implemented ?

   c) How it can control voltage regulation, line impedance and phase angle ?

   d) Draw and explain *Q vs P* control region of UPFC.

   2 + 2 + 5 + 5