APR -17/ TE/Insem.-14
T.E. (Electrical)
POWER SYSTEM - II
(2012 Course) (Semester-II)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) *Solve Q1 or Q2, Q3 or Q4, Q5 or Q6.*

2) *Neat diagrams must be drawn wherever necessary.*

3) *Figures to the right side indicate full marks.*

4) *Use of Calculator is allowed.*

5) *Assume suitable data, if necessary.*

Q1) a) Write a short note on Complex Power. **[4]**

b) A three phase 132kV line delivers 45MW at 0.8 pf lagging. Using power circle diagram find **[6]**

   i) Sending end voltage

   ii) The maximum power which the line can deliver with the above values of Vs and Vr.

   The line constants are $A = 0.9 \angle 2.5°$, $B = 100 \angle 70°$.

OR

Q2) a) Explain the term compensation and what are different methods of compensation? **[4]**

b) A long transmission line delivers a load of 60MVA at 110kV, 50Hz at 0.8 pf lagging. The constants at transmission line are $A = D = 0.98 \angle 0.32°$, $B = 70.3 \angle 69.2°$, $C = 4.44 \times 10^{-3} \angle 90°$. **[6]**

   Calculate-

   i) Receiving end active and reactive power.

   ii) Line Losses.

P.T.O.

Q3) a)   Compare EHV transmission with HVDC transmission.   **[5]**

b)   With the help of suitable diagram, explain different components of HVDC transmission system along with their function.   **[5]**

OR

Q4) a)   What are the recent developments in HVDC transmission system? State any two HVDC systems in India.   **[5]**

b)   Explain constant current control characteristic of HVDC transmission system.   **[5]**

Q5) a)   Explain the following terms in brief.   **[4]**
   i)   Disruptive critical voltage.
   ii)   Visual critical voltage.

b)   A 3-phase, 50Hz, 132kV transmission line consists of conductors of 1.17cm diameter and are spaced equilaterally at a distance of 3m. The line has surface irregularity factor = 0.96. The barometric pressure is 72cm of Hg and temperature of 20°C. Determine the fair and foul weather corona loss per km per phase. Assume that at foul weather the critical disruptive voltage drops down to 80% of the value during fair weather condition. Dielectric strength of air = 30kV(peak)/cm.   **[6]**

OR

Q6) a)   Describe the concept of corona loss and explain various methods to reduce Corona.   **[5]**

b)   A three phase 220kV, 50Hz transmission line consists of 1.2cm radius of conductor spaced 2m at the corner of an equilateral triangle. Calculate disruptive critical voltage between the lines. Irregularity factor = 0.96, Temperature = 20°C, barometric pressure = 72.2cm of Hg. Dielectric strength of air = 21.1kV(rms)/cm.   **[5]**

✦ ✦ ✦