National Institute of Technology, Delhi

Name of the Examination: B. Tech.

Branch : Electrical & Electronics Engineering   **Semester** : 5th

Title of the Course : Power System-II   **Course Code** : EE303

Time: 2 Hours   **Maximum Marks: 30**

Note : 1. Answer all the questions.

2. Do not write anything on the question paper except Roll number

3. Assume any data suitably if found missing

Q.1. What is Ferranti Effect? Deduce the expression for the voltage rise of an unloaded line.   **[Marks: 5]**

Q.2. Find the 3-phase power in terms of symmetrical components.   **[Marks: 5]**

The resolution of a set of three-phase unbalanced voltages in to symmetrical components gave the following results:

$V_{a0}=30 \angle -30^0$ V, $V_{a1}=450 \angle 0^0$ V, $V_{a2}=225 \angle 40^0$ V

The components of currents are:

$I_{a0}=10 \angle 190^0$ A, $I_{a1}=6 \angle 20^0$ A, $I_{a2}=5 \angle 50^0$ A

Determine the complex power represented by these voltages and currents.

Q.3. The ABCD constant of a nominal π network representing a three phase transmission line are:
A=D=0.97 $\angle$ 0.6^0, **B**=60 $\angle$ 70^0 Ω, **C**=0.001 $\angle$ 91^0 S.

Find the steady-state stability limit if both the sending-end and receiving-end voltages are held constant at 132 kV: **[Marks: 5]**

(a) With the ABCD constants as given

(b) With the shunt admittance neglected

Q.4. Derive the expression of ABCD parameters for long transmission line.   **[Marks: 6]**

Q.5. What do you mean by voltage stability. Give the name of methods for voltage control.   **[Marks: 5]**

Q.6. With the help of proper expression give the principle of decoupling.   **[Marks: 4]**