Roll No.:.....

National Institute of Technology, Delhi

Name of the Examination: B. Tech

Branch	**: EEE**	**Semester**	**: 5**
Title of the Course	**: Power System Analysis**	**Course Code**	**: EEL 302**

Time: 1.5hr **Maximum Marks: 25**

Note: ***Attempt all questions.*** Mark

Q. [1] Why base values are chose in per unit representation of a power system? 2

Q. [2] Why one of the buses taken as a reference bus in a power system? 2

Q. [3] For a given base voltage and base volt amperes, the per unit impedance value of an element is x. Calculate the per unit impedance value of this element when the voltage and volt amperes bases are both halved. 2

Q. [4] What are the different types of buses in power systems? What are the quantities specified at each bus? 2

Q. [5] Explain the significance of load flow analysis in a power system. 2

Q. [6] Two generators rated at 10 MVA, 11 KV and 15 MVA, 11 KV respectively are connected in parallel to a bus. The bus bars feed two motors rated 7.5 MVA and 10 MVA respectively. The rated voltage of the motors is 9 KV. The reactance of each generator is 12% and that of each motor is 15% on their own ratings. Assume 50 MVA, 10 KV base and draw the per unit reactance diagram. 5

Q. [7] The following is the system data for a load flow solution: 10

The line admittances:

Line	Admittance
1–2	2–j8.0
1–3	1–j4.0
2–3	0.666–j 2.664
2–4	1–j4.0
3–4	2–j8.0

P.T.O

The schedule of active and reactive powers:

Bus type	P	Q	V
Slack	–	–	1.06
PQ	0.5	0.2	1 + j0.0
PQ	0.4	0.3	1 + j0.0
PQ	0.3	0.1	1 + j0.0

Determine the voltages at the end of first iteration using Gauss-Seidel method.