Roll No.:.....

National Institute of Technology, Delhi

Name of the Examination: B. Tech.

Branch	**: EEE**	**Semester**	**: 5th**
Title of the Course	**: Power System Analysis**	**Course Code**	**: EEL302**

Time: 2 Hours **Maximum Marks: 25**

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. Find the Y_{bus} for the following line data. [5]

Line between Bus No.	Conductance	Susceptance	Shunt admittance
1-2	2	-j20	-
2-3	3.5	-j18	-j6
3-4	3	-j15	-
4-1	4.5	-j28	j5
1-3	6	-j30	-j8

Further modify the Y_{bus} if a line having admittance of (8-j15) is connected in between buses 2 to 4 with a transformer of turn ratio 1:50.

Q.2 For a network, bus data is as follows at the base of 100MVA, 230kV. [8]

Bus No	P_G	Q_G	P_D	Q_D	|V|(pu)
1	250	150	-	-	1
2	100	75	80	100	.95
3	125	60	100	105	.98
4	200	60	100	-	1.05

Line Data is as follows

Line between Bus No.	Conductance	Susceptance	Shunt admittance
1-2	2.5	-j21	-j6
1-3	3.8	-j22	-j6
2-4	4.2	-j15	-j6
3-4	4.5	-j28	-j6

Using fast decoupled method determine the first iteration solution to the power flow problem.

Q.3 Compute all the generalized terms of J matrix for N-R load flow problem in polar form. [4]

Q.4 Develop a node equation for a line of admittance Y_{jk} between buses j and k if a transformer of turns ratio 1:20 and a phase shifter $1.5\angle 30°$ connected in series between j and k. [4]

Q.5 Determine the Z_{bus} for the network shown in Fig. 1. [4]

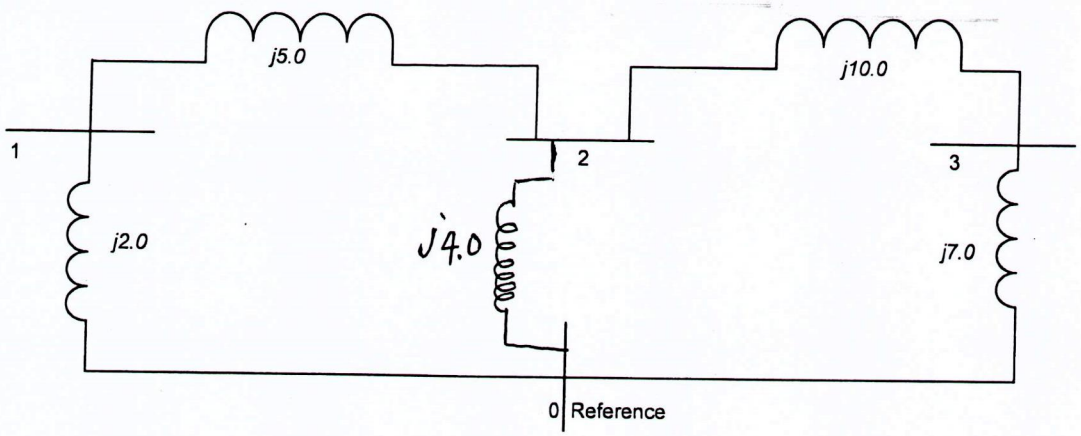

Fig.1