

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

ELECTRICAL ENGINEERING DEPARTMENT

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EE520 -171

Quiz 2

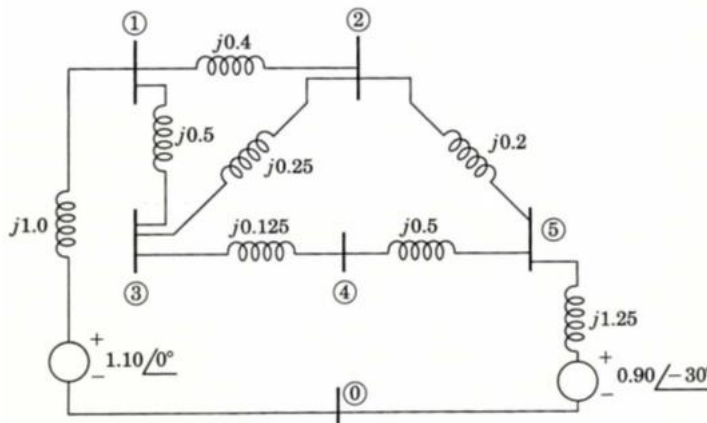
ser#:

I.D.:

Name:

Q1. The Y_{bus} for the following network is

(4 points)



a. $Y_{bus} = j$ $\begin{vmatrix} -5.5 & 2.5 & 2.0 & 0.0 & 0.0 \\ 2.5 & -11.5 & 4.0 & 0.0 & 5.0 \\ 2.0 & 4.0 & -14.0 & 8.0 & 0.0 \\ 0.0 & 0.0 & 8.0 & -10.0 & 2.0 \\ 0.0 & 5.0 & 0.0 & 2.0 & -7.8 \end{vmatrix}$

b. $Y_{bus} = -j$ $\begin{vmatrix} -5.5 & 2.5 & 2.0 & 0.0 & 0.0 \\ 2.5 & -11.5 & 4.0 & 0.0 & 5.0 \\ 2.0 & 4.0 & -14.0 & 8.0 & 0.0 \\ 0.0 & 0.0 & 8.0 & -10.0 & 2.0 \\ 0.0 & 5.0 & 0.0 & 2.0 & -7.8 \end{vmatrix}$

c. $Y_{bus} = j$ $\begin{vmatrix} -1.900 & 0.400 & 0.500 & 0.000 & 0.000 \\ 0.400 & -0.850 & 0.250 & 0.000 & 0.200 \\ 0.500 & 0.250 & -0.875 & 0.125 & 0.000 \\ 0.000 & 0.000 & 0.125 & -0.625 & 0.500 \\ 0.000 & 0.200 & 0.000 & 0.500 & -1.950 \end{vmatrix}$

d. $Y_{bus} = -j$ $\begin{vmatrix} -1.900 & 0.400 & 0.500 & 0.000 & 0.000 \\ 0.400 & -0.850 & 0.250 & 0.000 & 0.200 \\ 0.500 & 0.250 & -0.875 & 0.125 & 0.000 \\ 0.000 & 0.000 & 0.125 & -0.625 & 0.500 \\ 0.000 & 0.200 & 0.000 & 0.500 & -1.950 \end{vmatrix}$

Q2. In L_1U method, we follow the following to solve a factorized A matrix of a linear system " $Ax = b$ " (2 points)

- a. Use U first in a backward substitution, then L_1 in a forward substitution.
- b. Use U first in a forward substitution, then L_1 in a backward substitution.
- c. Use L_1 first in a backward substitution, then U in a forward substitution.
- d. Use L_1 first in a forward substitution, then U in a backward substitution.

Q3. The symmetric bus admittance matrix of a 5-bus system is stored in chained data structure column-fashion method as follows: (4 points)

	STO	IR	NX	NFIRST
1	-j18.76	1	1	1
2	j18.76	2	0	3
3	-j29.10	2	1	6
4	j4.0	3	1	8
5	j6.67	4	0	10
6	-j7.78	3	1	
7	j4.0	4	0	
8	-j22.84	4	1	
9	j12.5	5	0	
10	-j12.5	5	0	

Show the complete 25 elements of the bus admittance matrix.