CMPS- EEE III-II

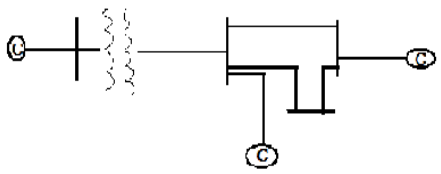
Unit.1

1. **Define below with examples.**
   (a). Graph and sub graph
   (b). Element
   (c). Node
   (d). Path and Oriented
   (e). Tree and Co-tree
   (f). Branch
   (g). Loop and Basic loop
   (h). Links
   (i). Cutset
   (j).

2. **Explain and difine with examples for given below.**
   (a). Incidence matrix
   (b). Bus incidence matrix
   (c). Branch path incidence matrix
   (d). Basic cut-set incidence matrix
   (e). Augmented cut-set incidence matrix
   (f). Loop incidence matrix
   (g). Augmented loop incidence matrix
3. **Define primitive network ? Represent primitive admittance and impedance with neat sketch and explain it clearly.**
4. **Explain and represent net work matrices by singular transformation.**
5. **Using network matrices by singular transformation, derive the equation for Bus admittance and Bus impedance matrix.**
6. **Using network matrices by singular transformation, derive the equation for Branch**

admittance and Branch impedance matrix.

7. **Using network matrices by singular transformation derive the equation for loop admittance and loop impedance matrix.**
8. **For the given power system representation draw the oriented connected graph.**

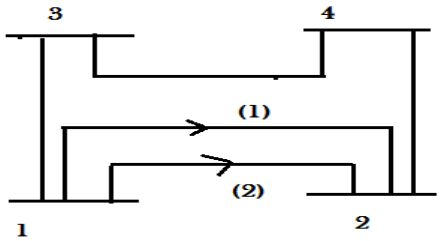


(i). Find incidence matrix
(ii). Bus incidence matrix
(iii). Basic cut-set incidence matrix
(iv). Augmented basic cut-set incidence matrix

9. **For the given above figure(1). Find.**

(i). Branch path incidence matrix.
(ii). Loop incidence matrix
(iii). Augmented loop incidence matrix

10. **For the given below fig(2). Find Zbus**
11. **For the given below fig(2). Find Yloop**
12. **For the given below fig(2). Find Zbr**



Element no	Bus code	impedance	buscode impedance

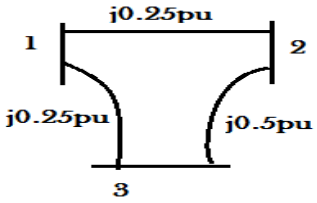
p-q	Zpq-pq	r-s	Zpq-rs
1	1-2(1)	0.6	
2	1-3	0.5	1-2(1) 0.1
3	3-4	0.5	
4	1-2(2)	0.4	1-2(1) 0.2
5	2-4	0.2	

Unit.2

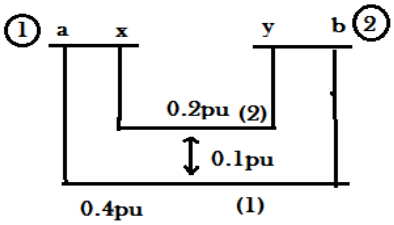
1. **Write algorithm for formation of bus impedance matrix with neat sketch and write performance equations of a partial network.**
2. **Write short notes on performance equation of apartial network.**

3. **Derive Zqi for addition of branch with injected current at 'i' and caliculate voltage at 'q'.**
4. **Derive Zqq for addition of branch with injected current at 'q' and caliculate voltage at 'q' .**
5. **Derive Zli for addition of branch with injected current and voltage source in series. By injecting current at 'i' and caliculate voltage at 'l' .**

6. **Derive Zll for addition of branch with injected current and voltage source in series. By injecting current at 'l' and caliculate voltage at 'l' .**
7. **Derive the equation for bus admittance matrix by direct inspection method**
8. **Compute the bus impedance matrix for the system shown in fig(3). By adding element by element take bus (1) as reference.**



9. **A transmission line exists b/w buses (1)and(2) with per unit impedance 0.4pu,another line of impedance 0.2pu is connected in parallel with it making it a double- ckt line with mutual impedance of 0.1pu. obtain by building algorithm method the impedance of the two ckt system.**



Unit.3

1. **Write short notes on power flow studies.**
2. **Write necessity for power flow studies.**
3. **Write conditions for successful operation of a power system.**
4. **Derive the static load flow equation.**

5. **Derive the static load flow equation in polar form.**
6. **Derive the static load flow equation in rectungalar form.**
7. **Classify the buses and explain in few words.**
8. **Write algorithm for N-R method.**
9. **write flow chart for N-R method.**
10. **Derive the equation for N-R method for single dimensionalcase.**

Unit.4

1. **Write algorithm for Gauss-seidel method.**
2. **Derive the equation for G-S method using load flow equations**
3. **Write flow chart for G-S method.**
4. **A two bus system having admittance values**

   Y11=Y12=1.6

   Y12=1.9 , V1=1.1

   P1+Q1=1.1+j0.2

   P2+Q2=0.5+j0.3

5. **For the given data find out the voltage at the end of two iteration by using G-S method.**

BUS	Pi(pu)	Qi(pu)	Vi	REMARK

1	-	-	1.04	SLACK BUS
2	0.5	-0.2	-	PQ BUS
3	-0.1	0.5	-	PQ BUS
4	0.3	-0.1	-	-

$$Ybus = \begin{bmatrix} 3-J9 & -2+J6 & -1+J3 & 0 \\ -2+J6 & 3.66-J2 & 0.66+J2 & -1+J3 \\ -1+J3 & -0.66+J2 & 3.66-J4 & -2+J6 \\ 0 & -1+J3 & -2+J6 & 3-J9 \end{bmatrix}$$